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# Household wealth in Italy

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Papers presented at the conference held in  
Perugia, 16-17 October 2007

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Earlier versions of the papers in this volume were presented at the conference “Household wealth in Italy”, held in Perugia, 16-17 October 2007. We are grateful to the participants to the conference for their useful suggestions and comments.

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The views expressed in this book are those of the authors of the individual essays and do not involve the responsibility of the respective institutions.

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## INTRODUCTORY REMARKS

*Ignazio Visco\**

For over thirty years the economists of the Bank of Italy have grappled recurrently with the problem of measuring wealth. If I may be permitted a personal recollection, in fact, this was the subject of one of my first works at the Bank, as part of a project to test the life-cycle hypothesis as regards household savings in Italy.<sup>1</sup> Then, and later, what produced new estimates of Italian households' net worth was the requirements of economic analysis (explaining consumption and saving behaviour) more than those of statistics proper (that is, strict compliance with the statistical standards of the national accounts).<sup>2</sup> Naturally, all these efforts depended on the "information frontier" of the data available at any given time.

The Bank's cyclical analysis, forecasting, and policy studies have used these statistical reconstructions, approximate though they are, to track the ways in which the Italian economy has changed and developed. But we always felt the need for systematic, comprehensive statistical data on the wealth of households.

The reasons for taking an interest in these data have been further strengthened in recent years. Such developments as population ageing and growing uncertainty over future incomes and welfare state benefits have increased the importance of real and financial assets and liabilities in determining economic behaviour. Moreover, alongside analytical reasons traditionally associated with the conduct of monetary policy, special importance now also attaches to direct study of the effects of variations in the prices of the assets held by households and firms, i.e. capital gains and losses.<sup>3</sup> As recent events have shown, these questions are essential both for monetary policy directed to price stabilization and for supervision directed to financial stability.

My impression is that in the last fifteen years the ratio of households' wealth to disposable income has risen considerably throughout the industrial world. This has been mainly due to the very sharp increase in housing wealth, however it is measured, while the upward trend in net financial assets has been much more moderate. The increase in wealth may reflect either the build-up of savings or rising asset values. Saving rates do not appear to have risen in recent years; indeed, in some countries they have declined significantly. Much if not all of the rise in the wealth/income ratio is thus due to an increase in asset prices, in particular house prices. To understand the causes of this development – and, more importantly, its possible consequences, such as the ever-increasing use of houses as collateral for loans – we need reliable information set in a consistent, systematic framework of data on the amount, composition and distribution of wealth. Equally crucial, in the new institutional context of the single European currency and the more general environment of the global economy, is not only reconciling macro with microeconomic data but also making sure that both are comparable internationally.

The instrument for achieving this twofold objective is the observance of international standards. And this is precisely the purpose of the methodological papers presented here, which review and integrate the macroeconomic estimates of household

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<sup>1</sup> See Tresoldi and Visco (1975); Frasca *et al.* (1979).

<sup>2</sup> See Pagliano and Rossi (1992); Ando, Guiso and Visco (1994).

<sup>3</sup> See for example Guiso, Paiella and Visco (2005).

wealth available to date. The aim is to adapt Italy's statistics on wealth to international standards using methods of estimation that allow for regular updating. The project whose results are set out today also testifies to the Bank of Italy's commitment to the development of statistics. In particular, it is worth underscoring that the statistical function has grown steadily in importance within the Bank, as it has internationally, and has now been officially recognised with the creation of a separate Economic and Financial Statistics Department within the Economic Research area.

The Bank of Italy has what we can call a critical mass of data and experience on the measurement of financial and real assets and liabilities. It has long been producing estimates of the financial components of wealth for the financial accounts, and for over four decades it has conducted a survey on household income and wealth. This enables us to take advantage of the possibilities of cross-tabulation between the two sources and work to integrate them, while also bringing new information into the dataset for the estimates as it becomes available. Accordingly, it was quite natural that the Bank of Italy should have sought to contribute to developing estimates of household wealth consistent with the international standards and then to put the results at the disposal of the community.

In working towards these aims, significant changes were made in past estimates. The most important revisions involved: (a) the value of housing wealth, whose estimation is now based on more accurate price data and a new benchmark, drawn from the 2001 Census, for determining the number and size of dwellings; and (b) the alignment of the components of wealth with the categories laid down in ESA95, which meant excluding the stock of consumer durables (previously included, and still to be taken into account in studying households' consumption decisions) and including producer households' non-residential buildings, plant and machinery and stocks, as well as several minor financial asset items.

According to the new estimates, the net wealth of Italian households in 2005 amounted to €7.7 trillion, or 8.4 times disposable income; in 2004 the ratio was 8.1, compared with the OECD estimate of 9.4, also based on internal Bank of Italy sources. In the new estimates, Italy still shows a higher ratio of wealth to income than other countries, but the gap is narrower. The share of real assets in total gross wealth is also lower than in previous estimates, at 57.9 per cent in 2005, only slightly higher than in the United Kingdom, in line with Germany and lower than France.

A distinctive trait of the Bank's research activity is the systematic effort at encountering with outside institutions. This is what we intend to achieve in today's conference, by inviting national accountants, experts in the field and above all the national statistical institute, Istat, to take part in the discussion and cooperate on the issues that will be addressed. We see our results to date not as definitive but as a first step, to be subjected to thorough critique. The estimation of wealth is a work in progress, and we can only stress our openness to still broader cooperation with Istat in constructing a complete set of wealth accounts for Italy and, even more important, in the steps that will follow, namely reconciling the stocks and flows of wealth and defining the methods for deflating the aggregates.

This task, daunting enough in itself, is further complicated by the fact that the international standards themselves are also undergoing revision. The most significant and most "sensitive" aspect of the revision, as we know, is the accounting treatment of pension liabilities. The discussion conducted within the international institutions has not yet been concluded, but it now appears most likely that, wherever the dividing line between liabilities that are within the integrated system of accounts and those entered as memorandum items in satellite accounts is eventually placed, these liabilities will have to



be fully measured and registered. The impact on the sectoral accounts of households and general government will be massive and will unquestionably dictate the priorities in our future cooperation.

In closing, let me express my sincere gratitude to the eminent guests who have accepted our invitation to discuss the papers that will be presented in the course of the next two days. In particular, let me thank our colleagues at Istat, not only in recognition of the never-failing cooperation between our two institutions, but also in the confident expectation that this dialogue and interchange will grow even broader and more active as we face the challenges ahead.

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**PRESENTATION OF THE PROJECT  
AND OVERVIEW OF THE NEW DATABASE**

*Chairman: Achille Lemmi, University of Siena*



## **ITALIAN HOUSEHOLD WEALTH: BACKGROUND, MAIN RESULTS, OUTLOOK**

*Luigi Cannari\* , Giovanni D'Alessio\* and Grazia Marchese\**

### **1. Introduction**

There are many benefits associated with having information on household wealth available. First and foremost, wealth is an important indicator of the economic wellbeing of households: knowing its amount, measuring increments over time and assessing its distribution among different households or geographical areas is vital to our understanding of Italian society and its development.

For central banks the availability of detailed information on household wealth, its total value, composition and distribution, can enhance many functions of economic analysis and policy formulation, including monetary policy, financial stability and payment systems. In the case of the monetary union, information also needs to be comparable across countries in order to provide an adequate picture of the European Union as a whole.

Moreover, this information is becoming increasingly useful as time goes by, in part because greater uncertainty and more precarious working arrangements have made it less meaningful to use income to measure quality of life. The level of involvement of international institutions and central banks in producing household wealth estimates is accordingly greater today than in the past.

At international level, the OECD provides the macroeconomic data on this phenomenon. Progress has also been made at a micro-data level, with the launch of the Luxembourg Wealth Study project (LWS), in March 2004. A harmonized survey of the whole euro area is likely to create new possibilities for analysis.

In Italy, the primary data sources on household wealth comprise the financial accounts and the results of the Survey of Household Income and Wealth (SHIW) conducted by the Bank of Italy. The financial accounts refer to financial wealth components only, while the SHIW data present the advantages and drawbacks typical of sample surveys.

The need to complement the macroeconomic data with the non-financial wealth components and to promote a closer reconciliation of micro- and macro-level data sources is the driving force behind this conference. Some of the papers focus on the methods used to estimate the macroeconomic aggregates that supplement the statistics reported in the financial accounts (for example, the residential property portfolios of households, the value of land and of non-residential buildings etc). The methods often exploit data on wealth gathered in sample surveys; whenever possible, the new aggregate estimates are compared with those inferred from the micro-level data.

The essential objective of this conference was to furnish the basic material for a discussion on how the balance sheets of households are constructed. The conference speakers did not, however, confine their comments to methodological aspects alone; the papers also embraced issues regarding the composition and distribution of wealth –

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\* Bank of Italy. Our thanks to I. Visco, L. F. Signorini and R. De Bonis for their useful comments.

including from an international comparative perspective – in addition to its impact on other important economic variables, with a view to stimulating debate on these issues.

After the conference the methods used to estimate the net wealth have been revised following the suggestions provided by participants; the new estimates display small differences from those presented at the conference. Figures and methods described in the papers have been revised accordingly.

Our introduction offers a broad overview of the topics addressed during the conference. Section 2 recalls the principal reasons for central bank involvement in the compilation of statistics on wealth. Section 3 looks at the Bank of Italy's experience in this specific field. Section 4 provides a brief synopsis of the research to date. Section 5 compares the new estimates with those previously available. Finally, Section 6 provides some thoughts on the future direction of the research.

## **2. The involvement of central banks**

The availability of data on wealth enables central banks to probe deeper into how household behaviour, financial markets and the main macroeconomic variables interact, bolstering their analyses undertaken in support of the various institutional functions.<sup>1</sup>

One of the channels for monetary policy transmission is constituted by the effects of wealth on consumer spending. For instance, an expansive monetary policy, by raising share prices and the financial wealth of households, can lead to an increase in consumption and production. Similarly, an expansive monetary policy, by increasing bank deposits and curbing adverse selection and moral hazard phenomena, can lead to an increase in household loans and consumption.<sup>2</sup>

Data on wealth and its composition are also useful to highlight risks present in the household sector, for example in terms of vulnerability to a fall in house prices or a rise in interest rates. Decisions on consumption and savings are vital to understand the overall economic cycle and long-term trends in the growth path; decisions on the composition of household portfolios are central to understanding the long-term evolution of asset prices.

The size and even the direction of the effects of variations in the various forms of wealth on economic behaviour, in addition to their implications for financial stability, can vary with the distribution of assets and liabilities among households with different resources; it is therefore desirable that the macroeconomic data be flanked by comparable micro-level data.

As Governor Draghi has also pointed out, data on wealth are becoming increasingly useful.<sup>3</sup> To date statistics have provided only partial responses to these requests for data. Despite being included in the European System of Accounts (ESA95),

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<sup>1</sup> Previous studies on these issues, conducted by the Bank of Italy in the early 1990s, are published in the volume edited by Ando, Guiso and Visco (1994).

<sup>2</sup> See for example, Mishkin (1996; 2006).

<sup>3</sup> "Changes in the functioning of advanced capitalist economies, as well as in the ageing of the population, contribute to shift the emphasis from income to wealth. In a society where employment tends to be permanent and where the welfare state generously supplies education, health and housing benefits, covers against the risk of unemployment and protects old-age income levels, the regularity of actual and expected income flows ensures living standards are maintained and holdings of wealth are less important. When these conditions cease to hold, on account of greater job insecurity or reduced social expenditure, wealth takes on a new significance for household prosperity. Personal wealth has a crucial role in cushioning against life's uncertainties, and the possibility of relying on a buffer stock makes people feel less vulnerable. But the implications are even more far reaching, as wealth is a crucial determinant of what people can do at the beginning of their lives." (Draghi, 2007).

under balance sheets,<sup>4</sup> comprehensive macroeconomic data on wealth are not currently available. A full dataset exists for financial assets and liabilities only.

International institutions and central banks have become increasingly involved in compiling statistics on these phenomena. The OECD publishes a series of macroeconomic data confined to the household sector;<sup>5</sup> these estimates are only modestly disaggregated by instrument type (net wealth, net financial wealth, financial and non-financial assets, equities, liabilities and mortgages), and significant differences of construction methods make them difficult to use for comparative purposes. Despite this, OCSE data are often utilized.

At the microeconomic level, in March 2004 the Luxembourg Income Study (LIS) and statistical offices, central banks, and research institutions from several European and North American countries launched the Luxembourg Wealth Study (LWS). The primary objective was to construct a cross-nationally comparable database on household wealth assembling micro-data from existing national sources. The second objective was to establish a network of data producers to share accumulated knowledge and to stimulate a much needed harmonization of concepts and definitions (Visco, 2007). The results of the project were recently presented at a conference organized by the Bank of Italy in Rome to which interested readers are referred.

We may soon see significant new developments if the Eurosystem implements the euro-wide survey on household finance and consumption currently under study. As Governor Draghi has said, “the importance of a survey on household finance with comparable data for the whole euro area can hardly be overstated” (Draghi, 2007).

### **3. The Bank of Italy’s experience in estimating wealth**

The primary source of microeconomic data on household wealth in Italy is the Survey of Household Income and Wealth (SHIW) conducted by the Bank of Italy. Launched in 1962, this survey regularly measures income, consumption (of durable and non-durable goods), wealth (and its various components), payment instruments, the characteristics of residential dwellings, forms of insurance, and the socio-demographic characteristics of household members (gender, level of education, work, social origin etc.).

Over the years, several specific issues related to wealth have been surveyed (for example, capital gains, inheritance, risk aversion, and so on).

Part of the sample, which in the latest surveys comprised around 8,000 households, has remained unchanged since 1989 from one survey to the next; in recent surveys half of these panel households had already taken part in previous surveys. In this way it has been possible to study phenomena such as household mobility between classes of wealth.

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<sup>4</sup> According to ESA95 a balance sheet is a statement, drawn up at a particular point in time, of the values of assets owned and liabilities outstanding. The balancing item is called net worth. The stock of assets and liabilities recorded in the balance sheet is valued at the market prices prevailing on the date to which the balance sheet relates. A balance sheet is drawn up for sectors, the total economy and the rest of the world. For a sector the balance sheet shows the value of all assets – produced, non-produced and financial – and liabilities and the sector’s net worth. For the total economy the balance sheet provides as balancing item what is often referred to as national wealth – the sum of non-financial assets and net financial assets with respect to the rest of the world. The balance sheet for the rest of the world, called the external assets and liabilities account, consists entirely of financial assets and liabilities.

<sup>5</sup> See, for example, OECD (2007).

Despite the considerable attention paid to strategies aimed at gaining the trust of respondent households,<sup>6</sup> the survey is affected by problems of selection bias, in other words by the lower levels of participation of wealthier households (D'Alessio and Faiella, 2002), and by under-reporting, i.e. statements regarding income or wealth that are not entirely truthful (Cannari and D'Alessio, 1990; 1993; D'Aurizio *et al.* 2006).

Despite these problems, the surveys have proved to be an irreplaceable instrument of economic analysis, as testified to by the over 500 scientific works produced by more than 350 Italian and foreign authors listed in the bibliography of works based on the survey data (Biancotti and D'Alessio, 2007).

The Bank of Italy also prepares the financial accounts, which record the country's financial assets and liabilities in terms of annual stocks and flows.<sup>7</sup> These can be used to evaluate the composition of households' financial savings and wealth, the quantity of funds raised by enterprises and general government, the stocks and flows of a country's assets and liabilities vis-à-vis the rest of the world, and the evolution of the financial structure with respect to indicators such as real wealth and disposable income.

The Bank's Annual Report for 1948 included a first, highly simplified, table of financial flows with a limited number of sectors. Since 1970 the financial accounts have been compiled by applying the definitions introduced by Eurostat's European System of Accounts (ESA). Between 1992 and 1995 a number of working groups coordinated by Eurostat drew up the rules of the new European system of national and regional accounts (ESA 95), which includes a financial account for each of the various institutional sectors. As things stand today, it is up to the European Commission, and especially Eurostat, to establish the methodology of the financial accounts, which are an integral part of the national accounts. The Memorandum of Understanding signed by Eurostat and the European System of Central Banks (ESCB) nonetheless places the financial accounts in the sphere of "shared responsibility" in view of the ESCB's direct interest in these statistics for the performance of its functions and the decisive role national central banks (NCBs) play in their compilation in many countries. Since 2001 the European Central Bank (ECB) has received data based on the financial accounts of the euro-area countries in accordance with the criteria established by the Monetary Union Financial Accounts working group and uses them in its *Monthly Bulletin* to compile the tables on saving, investment and the financing of non-financial sectors in the euro area. The Bank of Italy cooperates closely with the National Institute of Statistics (Istat) on the preparation of Italy's annual and quarterly financial accounts, especially as regards the measurement of the assets and liabilities of general government. Istat establishes the criteria for classifying the different institutional units. It also sends Eurostat Italy's annual financial accounts, which are part of the EU's official statistics.

Macroeconomic data on national accounts and the micro-level survey sample estimates present both advantages and drawbacks. The macroeconomic data are probably more accurate in their estimation of the overall value of instruments, but they do not permit data on wealth to be correlated with the characteristics of the various owners. Moreover, some pieces of the macroeconomic puzzle are missing, such as the value of firms organized as sole proprietorships and partnerships.

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<sup>6</sup> Sample households are sent a letter outlining the purposes of the survey in advance, and explaining that the data will be treated as confidential and used for statistical purposes exclusively; they also receive copies of several newspaper articles highlighting the importance of the survey. To those who request it, the interviewers – who always carry an ID badge – give a report containing the main results of the previous survey. Interviewees can also request further information both from the survey company (via a toll-free number) and directly from the competent Bank of Italy offices.

<sup>7</sup> See Banca d'Italia (2003) and (2006).



The micro-level data, by contrast, offer an opportunity for much more in-depth analysis – on the basis of the numerous data on the subjects that it is possible to gather in the surveys – but suffer from some quality issues, in particular the lesser willingness of the wealthiest families to respond to the surveys, and widespread under-reporting.

The availability of data from both sources is therefore particularly useful, insofar as there are obvious complementary areas for economic analysis purposes. This availability, moreover, facilitates useful comparisons for a cross-validation of estimates and offers the possibility of modifying and supplementing each source with the help of the other. In practice, a comparison of the two sources is often hindered by differences in the definitions of the household sector and the instruments considered; some papers for this conference have quite successfully addressed and resolved problems of these comparability issues.

The consolidated experience of the economists and statisticians of the Bank of Italy in the preparation of the financial accounts, on the one hand, and of the microeconomic estimates on the other, is an advantage for the Bank when it comes to: completing the macroeconomic estimates (with new information on the non-financial wealth components of households); comparing micro and macro results (which requires the redefinition of sectors and instruments to increase the comparability of the two sources); and improving the quality of both sets of statistics.

#### **4. The conference sessions**

The primary focus of the conference was on submitting to the critical assessment of experts the methodological aspects underpinning the construction of the balance sheets of households, in order to ensure that the estimation process is fully transparent and universally accepted. The conference also aimed, however, to discuss several aspects of a more strictly interpretative nature relating to the value, composition and distribution of household wealth. Three issues, in particular, were taken into consideration:

- 1) the methodologies: from estimates of the macroeconomic aggregates to a comparison of microeconomic data and aggregate estimates;
- 2) the composition of wealth and its relationship to other economic phenomena;
- 3) analyses of wealth distribution.

##### *4.1 Methodological issues*

As Alberto Baffigi shows in his analyses of the economists and statisticians active in the late nineteenth and early twentieth centuries, data on wealth have long been a subject of interest to a great number of scholars, including such names as Benini, Nitti, Einaudi, Gini, Livi and Pantaleoni. In the first 70 to 80 years of the Italian Republic estimates are numerous, but fragmentary.

Even the most recent estimates of household wealth (see Tresoldi and Visco, 1975; Pagliano and Rossi, 1992; Brandolini *et al.*, 2004) are hampered by differences in sources, definitions and methodology. Generally speaking these shortcomings are more apparent in the non-financial components<sup>8</sup> and have to do with gaps in the statistics on: a) the prices of total property holdings, residential and non-residential, and the quantity of non-residential buildings owned by households; b) the forms of wealth related to

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<sup>8</sup> The methodology for drawing up the financial components of the financial accounts is now quite well established.

households' business activities and; c) the main balance-sheet items of sole proprietorships and partnerships.

Three of the papers contain proposals for overcoming these limitations of current estimate methodologies.

Cannari and Faiella focus on estimating residential wealth, the prime requirement for which is data on house prices. In Italy there is no official source; data are collected by an agency of the Ministry of Finance and, mainly, by two private sources. Information is also available from the SHIW, which gathers housing data from a small, representative, sample of Italian households. Each source has its own pros and cons. Cannari and Faiella present a method for estimating the price per square meter of the average Italian house – using different sources – and compare the results with the SHIW estimates. According to their results, the SHIW estimates for 2002 turn out to be very close to market values. They then compare the SHIW estimates with Census data, showing that the survey overestimates the average surface area of houses while it strongly underestimates the number of secondary dwellings. Overall, in 2002 the SHIW-based housing wealth is about 14 per cent lower than macroeconomic estimates. The adjustment for under-reporting and non-reporting of dwellings changes the share of homeowners and the ratio of the housing wealth to total net worth; from a qualitative point of view, the profiles of these shares by income deciles show minor changes after the adjustment. The Gini index of housing wealth remains almost unchanged.

Cannari, Faiella, Marchese and Neri consider the wealth components linked to the entrepreneurial activities of producer families. The paper proposes methods to estimate the wealth components of lands, non-residential buildings, plant and machinery, transport equipment, inventories and goodwill; an assessment of valuables is also provided. They find that the value of households' tangible assets in 2005 was €4.9 trillion, the bulk of it in dwellings and almost 20 per cent in producer household assets (in particular lands and non-residential buildings). These estimates are then compared with the results of the SHIW, after the necessary adjustments to ensure the sample data are compatible with the macroeconomic data. In 2004, the most recent year for which they are available, the sample estimates of real wealth come to about 90 per cent of the aggregate estimate.

Rodano and Signorini assess the value of non-financial quasi-corporations owned by households. After showing the importance of micro-enterprises in Italy (according to Census data, about 3.4 million non-financial enterprises – out of a total of 4 million – are sole proprietorships or other unincorporated businesses), the authors outline the strategy that the Bank of Italy is developing for estimating the net worth of non-financial quasi-corporations with a view to filling the gap in the national Financial Accounts. This strategy is based primarily on data from the SHIW, which contains questions on households' equity holdings in all types of businesses. It also makes use of banking statistics and other financial statistics. Different methods are applied to 2004 data; it is encouraging that all the methods give very similar results, in the rather narrow range of €178-190 billion. While further robustness checks are warranted, the authors are confident that this is a good starting point for developing a method for regular estimation of the total value of non-financial quasi-corporations. Revising financial accounts to insert this estimate would result in significant changes in some important financial aggregates. The total amount of the item "shares and other equity" would increase by approximately 25 per cent; the value of households' financial assets would be revised upwards by about 5-6 per cent and that of the non-financial sector's liabilities by 7-8 per cent.

Albareto, Bronzini, Caprara, Carmignani and Venturini provide new estimates of real and financial wealth of Italian households by region from 1998 to 2005, following the methodology suggested by Cannari, D'Alessio and Venturini (2003) and Cannari, D'Alessio and Paiella (2006), who used regional series to break down the national figures in order to obtain territorial data. Compared with the earlier literature their estimates are more comprehensive: new, previously neglected, components of real and financial wealth are now estimated and included in overall wealth (physical capital, inventory and goodwill of producer households, insurance and pension fund reserves, trade credits, shareholders' loans to co-operative societies and shares in quasi-corporations). In addition, for the estimation of some components of wealth they use more accurate data that only recently became available. The estimates confirm the highly unequal territorial distribution of per capita wealth arising from the previous analyses.

#### *4.2 Value, composition and relations with other economic phenomena*

Bartiloro, Coletta and De Bonis examine the size and composition of household wealth compared with international portfolios (the main European countries, the United States and Japan) from the second half of the nineties to today. Using national and financial accounts data they define household wealth so as to minimize the problems arising from the different definitions adopted in the various countries. Special attention is paid to analysing the incidence of real wealth components and household debt to explain variations observed in levels of net wealth, the different weight and role of intermediaries in individual economies, the details of financial instruments in each country, and the aggregate degree of risk of portfolios.

Paiella's paper examines the literature on the link between stock and house prices and consumer spending. Overall, most studies agree that a statistically significant relationship exists between these variables. There is much less agreement on the size of the correlation and nature of the channel through which changes in wealth affect consumption. The estimates vary depending on whether aggregate or micro data are employed (aggregate data-based values are generally higher than micro data-based ones). The estimates also tend to be asset-specific, which may be due to mental accounts or preferences for accumulating wealth in a specific form for taxation, testamentary or other reasons. Moreover, there appear to be large differences across countries, which economic theory goes only so far in explaining. In fact, most determinants of the marginal propensity to consume, such as the intertemporal elasticity of substitution in consumption, the real interest rate, the probability of death and taxation, are similar across countries. The divergences most likely reflect different ways of measuring wealth and a failure to account for differences in the nature of the shocks to consumption and wealth. Estimates of the marginal propensity to consume out of wealth tend to be higher among American and British households than among continental European households. This, together with a higher wealth-to-consumption ratio, implies that the elasticity of consumption to wealth is much higher among the former. As to housing wealth effects relative to stock market wealth ones, the evidence suggests that the impact of a change in house prices on aggregate expenditure is at least as large as that of stock prices.

Regarding the nature of the correlation between wealth and consumption, wealth effects appear to be mainly direct in the US, while elsewhere the evidence points toward other channels and varies depending on the asset considered. Recent studies have also highlighted important differences in the transmission mechanism of equilibrium-distorting shocks. In Anglo-Saxon countries asset price fluctuations are behind most deviations of consumption, wealth and income from their common trend. After a shock, it is wealth that adjusts to restore the equilibrium. Instead, in those European countries with bank-based (as opposed to market-based) financial systems, transitory shocks appear to

be significant only for income, which is also the variable that adjusts in the event of deviations from the equilibrium.

Bassanetti and Zollino's paper, by contrast, presents an estimate of wealth effects on consumption in Italy. Based on the new estimates of household wealth, they find sound evidence in favour of the existence of a cointegrating relationship between consumer spending and different stock components, with positive wealth effects in the long run. They also investigate the role of transitory and permanent shocks in the variables they consider. They find that consumption, housing and non-housing wealth respond almost exclusively to permanent shocks, which play an overwhelming role also for disposable income over the long term, whereas in the short run the effects of transitory shocks are not negligible. The marginal propensity to consume out of housing and non-housing wealth turns out to be, respectively, 1.5-2 and 4-6 cents per euro.

### 4.3 *Wealth distribution*

Three of the conference papers address the distribution of wealth. The first contrasts the distribution of wealth among countries adhering to the LWS project. The other two refer to the Italian context and deal with two issues that have not received much attention in the literature to date, probably due to the lack of adequate information on the role of inheritance and capital gains in the accumulation and distribution of wealth.

The paper by Sierminska, Brandolini and Smeeding presents some descriptive evidence on household wealth for the nine countries included in the  $\beta$ -version of the LWS database. They focus on asset and debt participation, portfolio composition, and the distribution of net worth. As wealth accumulation patterns vary over the life cycle, it is useful to portray the demographic structure in each country before reviewing this evidence. The average household size ranges from 1.96 persons in Sweden to 2.65 in Italy and 3.35 in Cyprus. Italy emerges as the country with the most pronounced ageing process, with both the lowest share of young household heads (under 35 years) and the highest share of old heads (65 and over): 10 per cent and 33 per cent, respectively.

The age profiles for the possession of financial assets, principal residence, debt and positive net worth are significantly different across countries. Italy stands out as an outlier. On the one hand, intergenerational differences appear to be dissimilar, since the hump-shape of debt-holding and home ownership is much flatter than in the other countries. On the other hand, the low propensity to borrow and the parallel high proportion of positive net worth holders are common across all age classes.

Both in terms of mean and median income, the United States is the richest country followed by Canada and the United Kingdom, then Germany and Sweden, and lastly Finland and Italy. This is not the case for mean net worth, where the United States and Italy emerge as the richest nations, and Sweden and Finland the poorest. Once the authors switch to the median, the US falls toward the middle and is overtaken by Finland and the United Kingdom. Italy and the United Kingdom show the highest median net worth by far, almost twice the corresponding values for the other countries.

According to the  $\beta$ -version of the LWS database, the highest Gini concentration index is found in Sweden, followed closely by the United States, with Germany and Canada next in line. Finland, the United Kingdom and Italy exhibit a more equal distribution of net worth. When the share of net worth held by top population percentiles is considered, the US regains the lead: the richest one per cent of US households controls 33 per cent of total wealth, according to the SCF, or 25, according to the PSID, and the next four per cent controls another 25 per cent. These proportions are far higher than in all other countries, including Sweden.

This paper confirms the importance of formulating definitions and methods that are fully comparable across countries. Understanding the extent to which these results are affected by the different measurement methods or the differences in the comprehensiveness of the definition of wealth is an important question left for future LWS research.

Cannari and D'Alessio examine the role of intergenerational transfers in the wealth accumulation of Italian households. The traditional measures show that transfers received represent an important share of household net wealth. Direct estimates referring to 2002 range from 30 to 55 per cent, depending on the inclusion of the income stream produced by transferred assets. This share has shown a tendency to increase over the last decade.

In a lifetime perspective, the ratio of transfers received over the whole life span to the total amount of resources, both computed at the age of 15, is on average equal to 4.6 per cent. Computed on the recipients, the same ratio is 9.4 per cent. Households receiving transfers show higher levels of lifetime income, consumption, net wealth and transfers given than non-recipient households. Richer households receive larger transfers but, as a proportion of their current wealth holdings, transfers are greater for poorer households than richer ones. These results cannot be interpreted as an equalising effect of transfers, because people tend to react to transfers, changing their saving and consumption behaviour.

There is a positive correlation between transfers (received or expected over the whole life span) and lifetime income. Again, richer households receive greater inheritances and other wealth transfers than poorer households; as a proportion of their lifetime income, transfers are greater for poorer households than richer ones. This result is likely to be due to the much more important role played by family background variables than bequests as factors of transmission of inequality of lifetime resources.

The authors find a positive relationship between bequests left to children and inheritances received from parents; this relationship holds even after controlling for lifetime resources, suggesting the importance of the role of family traditions.

The paper by Cannari, D'Alessio and Gambacorta analyses the influence of capital gains on wealth distribution and growth. Macroeconomic estimates show that between 1989 and 2005 the net wealth of households (valued at 2005 prices using the consumer price index for the whole nation) increased by €3,640 billion, to €7,698 billion. In 1990-2005, total household net saving amounted to €2,091 billion, equal to 57.4 per cent of wealth variation. Over the same period, the contribution of capital gains to total household wealth variation was greater than 40 per cent.

Between 1990 and 2005, capital gains averaged around 13.4 per cent of household disposable income (which does not include them), while income from capital was about 30 per cent. Capital gains are highly variable over time; during half of the observed period they were larger in absolute value than one-fifth of disposable income.

Analysing SHIW data, the authors obtained results qualitatively similar to the National Accounts: between 1989 and 2004 the contribution of capital gains to per capita wealth variation was about 40 per cent in real terms. The Gini concentration index for wealth increased by 3.9 percentage points; holding asset prices constant, the increase is 2.4 points. Asset price variation explains more than one-third of wealth concentration dynamics.

These studies confirm the importance of the availability of data on intergenerational transfers and asset price variations with a view to further exploring aspects linked to wealth distribution.

## 5. Comparison with previous estimates

This section compares the estimates produced for this conference with the estimates for Italy processed in the past by Brandolini *et al.* (2004), Cannari and D'Alessio (2006) and the estimates provided by the Bank of Italy and published by OECD (2007).<sup>9</sup> For ease of presentation, we list the sources referred to by the acronyms BCDF (Brandolini, Cannari, D'Alessio and Faiella), CD (Cannari and D'Alessio) and BI-OECD.

There are various causes for the differences between estimates: for example, there are differences in the definitions of wealth and in the methodologies for estimating some of the common items, in particular dwellings. Finally, it should be considered that the estimates can diverge due to the availability of new sources or modifications and revisions of data (for example, the census data).

Table 1 quantifies the divergences between the various estimates provided in 2002, the last year for which all the abovementioned sources are available, and enables a review of the factors that determine divergences in the values of total net wealth.

In absolute terms, without taking account of the effect of differences in the definitions adopted, in 2002 CD and BI-OECD report a 10 per cent overestimate with respect to current estimates, while the total overestimation of BCDF is 2 per cent. This result derives from the combined effect of a variety of factors that we will now briefly outline.

When compared with the new figures, all the estimates listed below show an overestimation of net wealth of 8.1 per cent, due to the inclusion of durable goods, and an underestimation of around 13 per cent, due instead to the omission of valuables, non-residential buildings, plant and machinery, inventories, goodwill and loans to co-operatives.

The BCDF estimates report another underestimation due to the omission of lands (3.5 per cent) and net financial assets held by producer households (5.3 per cent). Moreover, all three estimates considered overestimate dwellings by an amount equal to around 15 per cent of net wealth.

Taking account of all these factors, the estimates are reconciled, not counting residuals that we can impute to the revisions of the individual data. It is significant that this residual is greater in the BCDF estimates, which are also the least recent.

Aside from the definitions, the most important new development regards the estimate of residential dwellings. Previous estimates computed the price per square meter on the basis of data from Consulente Immobiliare, while the current estimates combine these with data from an agency of the Ministry of Finance (Agenzia del Territorio).<sup>10</sup>

Based on the new estimates, in 2004 households' net wealth was equal to 8.2 times their disposable income, compared with 9.5 times in the previous estimates reported in OECD. By international standards, Italy continues to have the highest wealth to income ratio but the disparity has been considerably attenuated (Figure 1).

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<sup>9</sup> Cannari, D'Alessio and Paiella (2006), or CDP, make regional estimates by drawing on the national totals in the estimates by Cannari and D'Alessio (2006). The estimates published by the OECD in its Economic Outlook (2007) are arrived at by combining the data published in the Financial Accounts with the unofficial estimates of real assets provided by the Bank of Italy.

<sup>10</sup> The availability of this new data base has enabled a significant overestimation to emerge in house prices drawn from the data base of the Consulente Immobiliare, a twice-yearly survey of real estate agents published by Italian media group *Il Sole 24 Ore*; this is explained by the predominant role of prices in provincial capitals in this data base (see the paper by Cannari and Faiella).

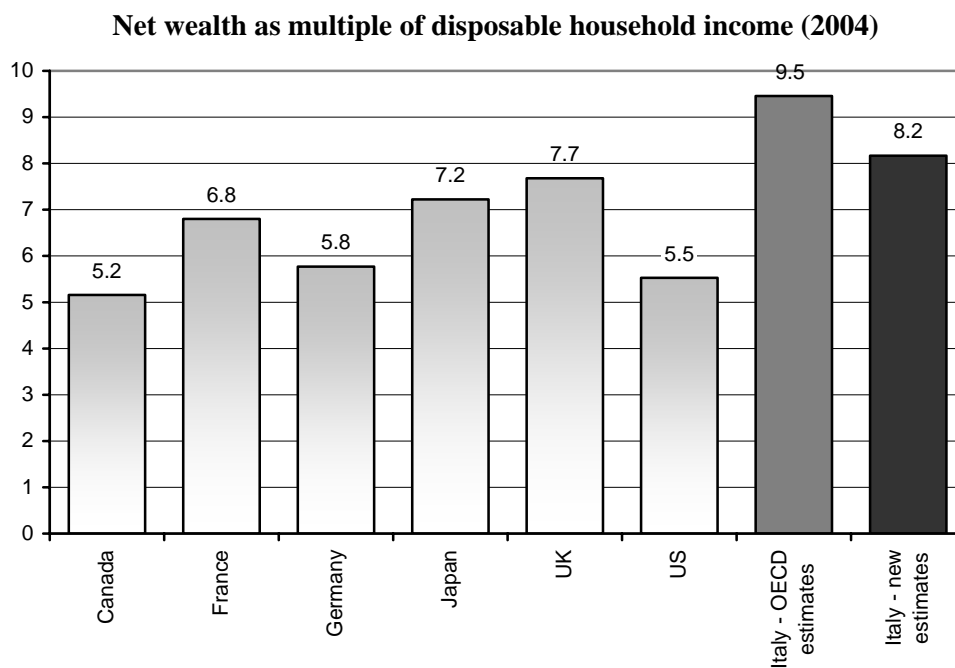
Table 1

**Reconciliation of current and previous estimates**  
(index, 100 = 2002 net wealth based on current estimates)<sup>(\*)</sup>

	BCDF	CD and CDP	BI-OECD (**)
Total value of net wealth.....	102.1	109.1	111.2
<i>Differences due to definition:</i>			
Durable goods.....	8.1	8.1	8.1
Valuables.....	-1.8	-1.8	-1.8
Lands.....	-3.5	-	-
Non-residential buildings, plant and machinery, inventories....	-8.5	-8.5	-8.5
Financial accounts: consumer households only.....	-5.3	-	-
Sole proprietorships.....	-2.5	-2.5	-2.5
Loans to co-operatives.....	-0.2	-0.2	-0.2
<i>Differences due to estimation methods:</i>			
Residential buildings.....	13.3	13.3	15.7
Other (residual).....	2.5	0.7	0.4

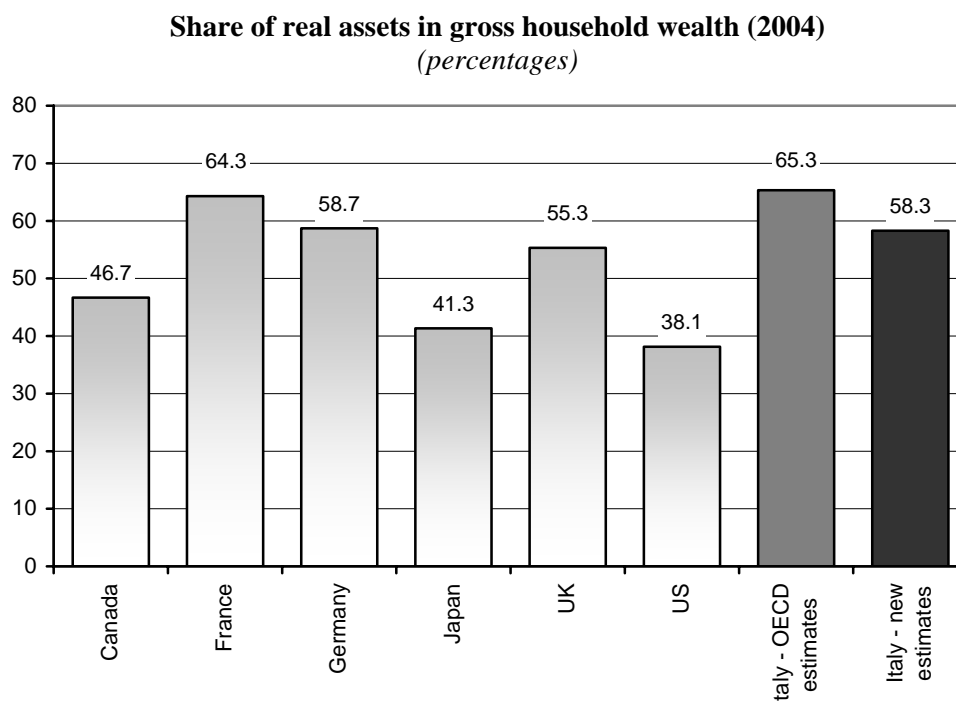
(\*) The values indicate the differences between old and new estimates. (\*\*) OECD, Economic Outlook No. 81, May 2007.

Figure 1



The share of real assets in gross wealth also differs with respect to the previous estimates; in 2004 this was equal to 58.3 per cent, a little over the UK estimate, almost in line with the figure for Germany and lower than France (Figure 2).

Figure 2



## 6. The questions outstanding

The papers presented at the conference enlarge the body of statistics available on household wealth and improve our knowledge of the interaction between this variable and other economic phenomena.

Numerous issues, nevertheless remain open, concerning the statistical methodology, economic analysis and the interpretation of the data. Let us draw attention to four points of particular importance.

1) As to the methodology of the national accounts, the data on wealth are the natural complement to the complex of information that illustrates how the production of goods and services is organized and how this output is channelled into consumption and savings / investment. Estimates of wealth must therefore be reconciled with savings and investment accounts. Given that variations in wealth are due to both savings and to capital gains, reconciliation heightens the need to enlarge the information set on asset price variations, especially for non-financial assets. There is also a greater need for better reconciliation between the financial and the non-financial accounts.

Also with regard to economic analysis, reconciling between savings and wealth poses questions. In the period 1995-2005 only 40 per cent of the increase in family wealth originated from savings; the remainder – almost 60 per cent – was attributable to capital gains. Obviously, what happened in this period may not be repeated in the future: while savings has a relatively stable history, capital gains are much more volatile and not infrequently make a negative contribution. But the data for the last few decades confirm that capital gains is a major component that cannot be treated as a residual or stochastic



disturbance that averages out to zero, unable to influence, in the long term, growth in wealth. Special attention needs to be paid to this component, in terms of the analysis of its origins, its characteristics and impact upon other fundamental variables.

2) Household wealth is only a part of the balance sheet accounts; so a natural extension of the statistical work begun here would be to consider the other institutional sectors.

Household wealth is very closely connected with other sectors, in particular State wealth<sup>11</sup>. Citizens can in fact be considered to be the final owners of the assets and of the liabilities of the State; taking account of this within a single framework is thus most appropriate. Pending the development of the full accounting scheme, household wealth estimates should usefully be flanked by those assets and liabilities of the State.

Another related aspect that has recently received considerable attention by international statistical organizations is that of future national social security obligations to pensioners.

Public pension wealth, i.e. the current discounted value of the future monthly pension entitlements, is not counted in the definition of household wealth adopted here. Nevertheless, the amount is large indeed, such as to influence the savings behaviour of households very significantly: where the pension system provides higher retirement benefits, households have less incentive to save, because they can count on a definite income in old age. On the other hand, family pension wealth is a State liability of equal amount. As citizens sooner or later will be called upon to settle this liability, the pension element, overall, does not increase household wealth on an infinite time horizon, but it is crucial from the distributive standpoint, as a transfer from children to parents.

Modifying the national accounting framework to include public pension liabilities has advantages and disadvantages that cannot be discussed here;<sup>12</sup> in any event the development of adequate pension accounting, separate from ordinary national accounts, would seem to be a particularly useful advance.

3) With regard to the distributive aspects and the use of wealth as an indicator of economic welfare<sup>13</sup> the question of which deflator to use remains open. Since wealth can be defined as a reserve that can be used for current or future consumption, it is reasonable that its value should be measured in relation to the level of prices, i.e. at a purchasing power parity.

To take prices at any single point in time as the deflator when wealth potentially refers to future consumption as well is no doubt partial.

Theoretical frameworks capable of taking this aspect into account have been examined in the literature, leading to the proposal to include asset prices in the measurement of inflation. As Alchian and Klein (1973) note, consumer price indexes and the GDP deflator share the defect of being limited respectively to consumption and production. In their view a complete measure of the cost of living should also consider future asset price variation. If, for example, house prices rise while rents remain stable, the index – according to these authors – should record the increase. This would reflect the

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<sup>11</sup> See Barro (1974; 1989).

<sup>12</sup> See Semeraro (2006).

<sup>13</sup> As an indicator of economic welfare wealth is not, as noted, a sufficient statistic (Merton, 2006); levels of income and consumption seem to be at least as effective to this end. Nevertheless, monitoring the level of households' wealth is useful for a more complete assessment of their economic condition.

increased cost of a future house purchase or, in an equivalent way, the future rent increases that, in equilibrium, are coherent with the increase in the price of houses.<sup>14</sup>

Reiter (1999) also holds that wealth should not be appraised using consumer price indexes; on the contrary one should use the expected interest rate for future income, a parameter that takes account of the relative prices of assets over time. According to this rule a variation in the value of wealth due solely to a variation in the expected interest rate should be ignored, as having no effect on expected income in the future.

Numerous studies have been conducted in this field; most acknowledge the theoretical founding of the approach described above, but many highlight the difficulty of deriving an index that, taking account of asset prices, is not dominated by their volatility and remains useable in practice; we must also note the incompleteness of forward markets and the consequent unavailability of future price data for the majority of goods and services.

Whether asset prices should or should not be included in the measurement of inflation and, consequently, whether in defending price stability central banks should or should not react to asset price variations, is still subject to debate. There is no doubt that the evolution of asset prices merits special attention from central banks.

A further element worth noting is the scarcity of price level information in the various Italian regions.

Work based on the elementary price data collected by the municipal statistical offices for the consumer price index shows a negative differential between the South and the Centre, and even more so the North. The differential is wider for services than for goods, and practically nil for energy. Price differentials are closely correlated with regional per capita GDP. Caution is needed in interpreting the findings of these studies, given their methodological limitations and the only partial representativeness of the samples. Nevertheless, they suggest that territorial disparities in wealth at purchasing power parity may be much less than at nominal values. These results further underscore the urgent need for indexes of comparative purchasing power by region.<sup>15</sup>

4) The availability of macroeconomic data on wealth also has implications for microeconomic studies. While maintaining their own specificity and definitions, sample surveys should allow the smooth reconstruction of aggregates comparable with the macroeconomic aggregates. The comparison should produce useful indications for assessing and improving the quality of data from both sources. However, in some instances comparability between the microeconomic estimates and the aggregates of national accounts may be an obstacle to international comparability of microeconomic studies, due to differences between the accounting systems of Europe and the United States. Some authors have accordingly suggested disaggregated definitions that can be recomposed in a way that ensures comparability between microeconomic studies of the various countries and comparability between each micro study and the relevant system of national accounts. The methodological reflection on the redefinition of the components of wealth in some papers for this conference helps us to advance towards greater comparability of micro and macro estimates.

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<sup>14</sup> According to Goodhart and Hofmann (2000), further to the considerations of Alchian and Klein (1973), the inclusion of asset prices in the inflation measure would be justified for practical reasons since some of these prices, in particular house prices, are strongly associated with inflation trends.

<sup>15</sup> Istat has been engaged for some time on a project to calculate indexes of purchasing power parity on a regional basis, but the results are still unavailable.

With regard to Italy, there is ample scope for improving the quality of sample survey estimates by using macroeconomic data on household financial assets and liabilities, available by value classes in the banking statistics. Conversely, sample data, occasionally the only source from which one can derive information regarding some wealth components, such as the value of micro-businesses included in the household sector, can be usefully employed to integrate macroeconomic estimates.

A good part of the methodological investment has already been made. Now we have to continue the development along the lines traced out and fully exploit the new data for economic analysis.

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## ITALIAN HOUSEHOLD WEALTH IN A CROSS-COUNTRY PERSPECTIVE

*Laura Bartiloro<sup>\*</sup>, Massimo Coletta<sup>\*</sup> and Riccardo De Bonis<sup>\*</sup>*

### 1. Introduction

Household wealth has been the focus of many different lines of research. An incomplete summary includes: the studies of the wealth effect, notably the effect of wealth variations on consumption (see Poterba, 2000 and Paiella, in this volume, for two surveys); the contributions looking at wealth to deduce information on agents' risk aversion (Guiso, Haliassos and Jappelli, 2002); the literature that considers the financial instruments held by households as a way to understand peculiarities of financial intermediaries in different countries (Goldsmith 1969; ECB 2002; Babeau and Sbrana, 2002); the investigation of how changes in household wealth and indebtedness may affect macroeconomic and financial stability (Cecchetti, 2006; White, 2007); and the study of the links between portfolio choice and retirement saving (Kapteyn and Panis, 2003; Group of Ten, 2005; Fano and Sbrana, 2007). More recently, the deceleration of house prices in the US and the crisis of the sub-prime segment have raised concern that such downturns might take place in other countries that also experienced a rapid rise in house prices in the recent past, leading to negative consequences on aggregate demand (Visco, 2007).

The aim of this paper is to offer a comparative analysis of household wealth in the main industrialised countries: the United States, the United Kingdom, Japan, Italy, France, Germany and Spain. Particular attention is devoted to Italy. We distinguish between net worth, financial wealth, indebtedness and real wealth. In commenting the empirical evidence, we summarise some of the recent literature on the different subjects. The analysis covers the period 1995-2006.

Data comparability is a serious issue. For Italy we use the new statistics on wealth produced for this conference. The new data improve a lot the old estimates of the different components of real wealth<sup>1</sup> while the corrections were smaller for financial assets. These changes are likely to have increased the international comparability of wealth data by removing certain Italian anomalies (Marchese, Cannari and D'Alessio, in this volume). In general, however, complete statistics on household real assets are not always available and they are characterized by a lack of harmonization. Moreover the description of the methods used to estimate real assets is often poor.

The availability of data is better for financial wealth. In this paper financial assets and liabilities are taken from the financial accounts. In Europe these statistics have been largely harmonized by the European System of Accounts of 1995. Differences, however, remain concerning the methodology of estimation for certain items, e.g. unquoted shares, other equity and trade credit. Differences are stronger with the US and Japan; the definitions of financial instruments and institutional sectors used in the American and Japanese flow of funds are sometimes different. This necessarily affects comparisons. In a few words, given the differences between the national statistics employed, especially

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<sup>\*</sup> Bank of Italy. This paper builds on Bartiloro *et al.* (2006) and De Bonis, Fano, Sbrana (2007). Andrea Generale, Grazia Marchese, Matteo Piazza, Gabriele Semeraro, Federico Signorini, Andrea Silvestrini provided useful comments on previous versions. We thank Giuseppe Acito, Maria Paola Ferraresi, Alessandra Salvio and Stefano Vicarelli for excellent research assistance.

<sup>1</sup> See Cannari and Faiella, in this volume.

with regard to real wealth, the article will present in many occasions an exploratory analysis. Specific data issues will be noted where appropriate.

The paper is divided into nine sections. Section 2 presents the main features of household financial wealth, debt and real assets across countries. Sections 3 to 7 concentrate on financial wealth: Section 3 looks at the composition of financial assets in terms of stocks and flows; Section 4 studies deposits; Section 5 investigates shares and other equity; Section 6 analyses mutual funds; and Section 7 focuses on pension funds and insurance companies. Section 8 considers household debt. The last Section summarises the main conclusions of the paper. A Statistical Appendix describes the sources of the data.

## 2. A first look at household wealth

In this Section, we present a broad overview of household net wealth, financial wealth, real wealth, and debt in our sample countries.

### 2.1 Household net wealth

Table 1 shows that the highest levels of the ratio of household net wealth to income are found in Italy and in the UK, with a value around 8 times disposable income.<sup>2</sup> France and Japan have net wealth that is approximately at 7 times disposable income. Levels around 5 are found in Germany and the US.<sup>3</sup>

We do not have complete explanations of why household net wealth differs across countries. Net worth is linked to the accumulation of past saving,<sup>4</sup> and to the movements in the price of securities, especially shares, which determine the level of capital gains. In this respect, as we will see in Section 3, it is always useful to look not only at stocks of wealth, but also at its flows, which are not affected by valuation issues. Net wealth is also influenced by institutional characteristics influencing the shape of financial and banking markets, by the conditions of the public pension schemes, by the links between households and other institutional sectors, and by demographic trends.

The relationship with saving is especially complex. On the one hand, a country that has a structural large saving rate would be expected to have an higher wealth to income ratio. On the other hand, high levels of wealth may reduce the propensity to save from current income. There has recently been a lot of attention paid to the idea that price bubbles increased household net worth and were at the origin of low saving rates in Anglo-Saxon countries: in other words, the decline in the saving rate might be traced back to the wealth effect (see Dreger and Reimers, 2006, and White, 2007 for a pessimistic view).<sup>5</sup>

There is no attempt to discuss these issues in detail here. Rather, we concentrate on the determinants of the different assets and liabilities that make up household net worth.

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<sup>2</sup> To enhance data comparability, we compute this ratio in a slightly different manner than in other papers presented in this conference. The disposable income in the denominator is referred to households plus non profit organizations because the latter cannot be disentangled from the former in most of the countries. We also use gross rather than net disposable income as a scale factor. The same approach is followed by Bier (2007).

<sup>3</sup> Net wealth cannot be calculated for Spain because the country does not publish data on household real wealth.

<sup>4</sup> Practices for the compilation of the household saving ratios are still different in the OECD countries. Therefore the analysis may be affected by these statistical differences (see ECB, 2004).

<sup>5</sup> "...the decline in the saving rate over the past decade can be explained by the decline in interest rates and by the increase in overall household wealth ... most importantly stock market wealth", Greenspan, 2005.



## 2.2 Financial wealth

Countries can be divided into two groups as far as financial wealth is concerned (Table 1).

On the one hand, financial wealth is more than four times disposable income in the United Kingdom, the USA and Japan. On the other, the same ratio is between two and a half and three and a half in Italy, France, Germany and Spain. Per capita figures broadly confirm the gap between the two sets of countries.

Table 1

<b>Household wealth</b> (percentages with respect to disposable income)				
Countries and years	Financial assets	Financial liabilities	Non financial assets	Net worth
	(FA)	(FL)	(NFA)	(FA+NFA-FL)
<b>Italy</b>				
1995 .....	2.56	0.38	3.95	6.14
2000 .....	3.63	0.51	4.11	7.24
2003 .....	3.35	0.55	4.61	7.41
2005 .....	3.57	0.63	4.99	7.94
<b>France</b>				
1995 .....	2.12	0.63	2.87	4.35
2000 .....	2.67	0.72	3.20	5.15
2003 .....	2.54	0.75	4.08	5.87
2005 .....	2.80	0.82	5.13	7.12
<b>Germany</b>				
1995 .....	2.08	0.90	3.11	4.29
2000 .....	2.55	1.07	3.24	4.72
2003 .....	2.59	1.04	3.16	4.71
2004 .....	2.76	1.01	3.06	4.82
<b>Spain</b>				
1995 .....	2.17	0.62	n.a.	n.a.
2000 .....	2.49	0.81	n.a.	n.a.
2003 .....	2.49	0.99	n.a.	n.a.
2005 .....	2.65	1.20	n.a.	n.a.
<b>United Kingdom</b>				
1995 .....	3.95	1.06	2.80	5.69
2000 .....	4.86	1.14	3.78	7.50
2003 .....	3.97	1.41	4.72	7.27
2005 .....	4.41	1.55	5.02	7.89
<b>United States</b>				
1995 .....	3.96	0.94	1.64	4.66
2000 .....	4.59	1.03	1.78	5.34
2003 .....	4.12	1.20	2.06	4.97
2005 .....	4.28	1.34	2.35	5.28
<b>Japan</b>				
1996 .....	4.09	1.33	4.24	7.00
2000 .....	4.49	1.35	3.85	6.99
2003 .....	4.78	1.31	3.44	6.91
2004 .....	4.82	1.30	3.30	6.81

Source: See the Statistical Appendix.

A first explanation of the difference between the two groups of countries is that the proportion of households holding shares directly in the UK, the US and Japan is higher than in the second set of countries. Individuals who invest directly in shares are 30 per

cent of the population in the UK, 29 per cent in Japan and 26 per cent in the US, while the figures are 15 per cent in France, 8 per cent in Germany and 7 per cent in Italy (Zingales, 2007). Table 2 confirms that the volume of quoted shares is larger in the first set of countries than in the second. Even if there are statistical differences between survey information and macro data, household indirect participation in financial markets also seems to be different between the two sets of countries.

A second reason is that public pension schemes are less important in the first group of countries than in the second.<sup>6</sup> Household investments in insurance technical reserves are accordingly greater in the UK, the US and Japan than in Italy, France, Germany and Spain.

In the last ten years the ratio of financial assets to disposable income grew in all countries, but the progress was not steady. Financial assets increased between 1995 and 2000, benefiting from the boom in stock markets. The slowdown of equity prices hit financial assets between 2000 and 2003 in every country except Germany and Japan, where deposits are prominent in the household portfolio. The subsequent recovery of stock prices caused a new increase of financial assets in relation to disposable income. Not only the different degree of financial development but also the role of intermediaries is a key explanation of the national stories. This is true not only for banking deposits in Japan, but also for insurance technical reserves in the UK, the US and Japan (Table 2).

Between 1995 and 2006 financial deepening was driven by the deregulation of finance, which led to a broadening of the range of instruments available for the allocation of saving. The greater integration and globalization of financial markets has been reflected in a growth of financial transactions with abroad; in most of the countries the ratio of external financial assets to GDP has risen.

The question of the convergence of the composition of household financial instruments in different countries is an open issue. Results of previous papers seem to depend on the methodology applied, the time span considered and the countries taken into account. Bianco, Gerali, Massaro (1997) compared six countries' financial systems using financial accounts, concluding that convergence across systems was still limited and major changes were under way only in France.<sup>7</sup> Studying 12 European countries in the period 1995-2000, Bartiloro and De Bonis (2005) found  $\beta$ -convergence but not  $\sigma$ -convergence for the ratio of financial assets and liabilities held by residents to GDP. Di Giacinto and Esposito (2006) found  $\beta$ -convergence for indicators of financial development of 13 European countries, but not for banking products. Using statistics from the 1980s for the main OECD countries, De Bonis, Fano and Sbrana (2007) reported a reduction in the standard deviation of the logarithm of the ratio of household financial assets to disposable income. All in all, signs of convergence of the composition of household financial wealth are emerging.<sup>8</sup>

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<sup>6</sup> See Semeraro (2006) on the possibility to include the liabilities implied by pay-as-you-go systems in the financial accounts. See Banca d'Italia (2003) on Italian financial accounts methodology.

<sup>7</sup> Schmidt, Hackethal and Tyrell (1999) show that France is the European country that during the 1990s introduced the most important reforms of financial markets in the direction of the Anglo-Saxon model.

<sup>8</sup> The lack of long time series on household financial assets makes the econometric exercises on convergence complex. Bonci and Coletta (2006) published estimates of the Italian financial accounts from 1950 onwards. Long time series are also available in the US, Japan and Canada. The OECD, jointly with the Economic Research Unit of Pioneer Global Asset Management, UniCredit and some central banks and national statistics offices, is working to extend back the financial accounts for a group of countries. See Sbrana (2007) on the UK case and De Bonis, Fano and Sbrana (2007) for a summary of the project. On the basis of preliminary time series from the '80s, Bruno and De Bonis (2007), using disposable income as a scale factor, found convergence for household total financial assets, shares and other equity and insurance technical reserves but not for securities other than shares, and currency and deposits.

Table 2

**Household financial assets with respect to disposable income**  
(percentages)

Countries and years	Deposits	Securities other than shares	Shares and other equity			Insurance technical reserves	Other assets
				<i>of which quoted shares</i>	<i>of which mutual funds</i>		
<b>Italy</b>							
1995 .....	0.99	0.64	0.59	0.10	0.10	0.25	0.10
2000 .....	0.83	0.62	1.66	0.37	0.56	0.40	0.11
2003 .....	0.85	0.68	1.22	0.23	0.37	0.50	0.10
2005 .....	0.88	0.66	1.33	0.19	0.34	0.58	0.11
<b>France</b>							
1995 .....	0.88	0.12	0.51	0.08	0.28	0.51	0.09
2000 .....	0.89	0.08	0.79	0.13	0.30	0.80	0.11
2003 .....	0.86	0.05	0.66	0.08	0.27	0.85	0.12
2005 .....	0.86	0.04	0.79	0.12	0.27	0.98	0.13
<b>Germany</b>							
1995 .....	0.88	0.25	0.38	<i>n.a.</i>	0.15	0.55	0.02
2000 .....	0.87	0.23	0.70	0.19	0.29	0.72	0.03
2003 .....	0.93	0.26	0.59	0.10	0.31	0.78	0.04
2005 .....	0.96	0.27	0.67	0.11	0.33	0.83	0.03
<b>Spain</b>							
1995 .....	1.10	0.08	0.65	0.11	0.22	0.22	0.12
2000 .....	0.99	0.06	1.00	0.28	0.34	0.34	0.09
2003 .....	0.98	0.07	0.99	0.19	0.31	0.37	0.08
2005 .....	1.01	0.06	1.11	0.20	0.35	0.39	0.08
<b>United Kingdom</b>							
1995 .....	0.94	0.08	0.78	0.34	0.15	2.00	0.15
2000 .....	0.99	0.07	1.13	0.49	0.24	2.54	0.14
2003 .....	1.07	0.06	0.62	0.27	0.16	2.09	0.13
2005 .....	1.14	0.05	0.69	0.30	0.18	2.39	0.13
<b>United States</b>							
1995 .....	0.53	0.38	1.78	<i>n.a.</i>	0.33	1.22	0.04
2000 .....	0.47	0.30	2.30	1.12	0.53	1.44	0.07
2003 .....	0.53	0.30	1.84	0.69	0.49	1.38	0.07
2005 .....	0.55	0.32	1.91	0.60	0.56	1.41	0.08
<b>Japan</b>							
1996 .....	2.09	0.31	0.44	0.22	0.11	1.04	0.22
2000 .....	2.40	0.22	0.49	0.25	0.12	1.18	0.21
2003 .....	2.60	0.17	0.57	0.28	0.11	1.23	0.21
2004 .....	2.58	0.19	0.62	0.28	0.13	1.24	0.19

Source: See the Statistical Appendix.

### 2.3 Financial liabilities

In the last ten years, the ratio of household debt to disposable income increased in all the countries in question, with households taking advantage of a general environment of low inflation and low real interest rates. However, the dispersion of household financial liabilities is larger than that of financial assets. In Italy the ratio of household debt to disposable income is around one third that in the UK. The fact that the variance of the debt/disposable income ratio is greater than the variance of the financial asset/disposable income ratio may indicate that national institutional factors are still important in influencing household debt while financial deepening, as shown in Section 2.1, was more widespread across countries. Bertola and Hochguertel (2007) noted that the household menu of debt instruments is more severely constrained than the menu of assets.

High levels of debt exist not only in the UK but also in the US and in Japan, while in continental Europe the highest level is found in Spain: in Section 9 we provide a thorough examination of household liabilities.

#### 2.4 *Non financial assets*

As we underlined in Section 1, statistics on real wealth are not as harmonized as the European financial accounts. Therefore, much more caution must be exercised in commenting the data and any hypothesis has necessarily to be considered tentative.

In recent years, house prices increased in all the main OECD countries, with the exceptions of Japan and Germany. As far as the ratio of real assets to disposable income is concerned, our set of countries may be divided into three groups (see Table 1).

First, household real wealth is high in the UK, France and Italy. In the last few years the UK and France have been among the countries that experienced the largest increases in house prices relative to incomes and in the price to rent ratio. In the UK, a key factor contributing to the pronounced house price cycle has been an inelastic housing supply (OECD, 2005); there has also been a spatially concentrated demand, given the major role of London as a financial and business centre. Forecasts also indicate an increase in the number of households, both in London and in the South-East of the UK. In France as well the increase of house prices has been explained with the growing number of families. According to Gervais (2007), French households face high opportunity cost of renting instead of buying. In fact legislation allows rents to be indexed on construction prices. In Italy, the ratio of real assets to disposable income may have different explanations: houses were traditionally seen as safe investments, partly owing to the backwardness of the financial system in the past and the high inflation in the 1970s and 1980s; as in other countries, housing was considered a profitable and secure investment and part of the retirement strategies of an ageing population; the difficulties of stock markets between 2000 and 2003, together with certain large and well publicised corporate and sovereign bond defaults, also provided incentives for rising house demand and prices; finally, the imperfections in the market for rented property probably stimulated house purchases.

A second group of countries includes Germany and Japan, where lower levels of real wealth are observed. In Germany house prices remained stable in the last few years, also in the light of the low prices prevailing in the old East Germany (ECB, 2003); Eymann and Borsch-Supan (2002) noted that German households have low holdings of real estate. In Japan the collapse of the bubble economy caused a general deflation and a decrease of national wealth during the 1990s, with a particularly sharp decline in land prices (Statistical Handbook of Japan, 2003).<sup>9</sup>

Third, household non-financial assets are lower in the US than in the other countries. Glaeser (2004) summarised the research on the explanations of the rise in American housing prices between 1998 and 2003. In considering the different roles of demand, supply and regulation, he underlined that soaring home prices were mainly coastal phenomena, that left the internal states of the US untouched. There is a huge quantity of cheap land in the US, which may explain why “*housing remains and will remain inexpensive in most areas of the country*”. The US also has an extremely low population density (31 inhabitants per kilometre). Coming to the current business cycle, for the first time since the Great Depression home prices are now falling in the US on a year-on-year basis (Roubini, 2007). According to many scholars, this decline will

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<sup>9</sup> Iwaisako (2003) studied the age-related variation of the household portfolio in Japan, paying particular attention to its link with real estate holdings.

continue because houses were overvalued (Finicelli, 2006) and the production of new homes still exceeds demand.

### 3. The composition of financial wealth: stocks and flows

In this paragraph we distinguish between four forms of financial wealth: deposits, securities other than shares, shares and other equity, and insurance technical reserves (Table 3).<sup>10</sup> In Sections 4 through 7, we study finer breakdowns of each item.

In the last ten years the decrease of deposits in the household portfolio, which is an old phenomenon, continued in all the continental European countries. On the contrary, the share of deposits remained relatively stable in the UK and the US, where banking disintermediation took place earlier. As we saw, Japan is an outlier: households invest around 50 per cent of their financial wealth in deposits, a value that is incomparable with that observed in other OECD countries. The size of the Post Office is a key aspect of this story. Leaving Japan aside, between 1995 and 2006 the share of deposits decreased sharply in Italy, Spain and France. However bank disintermediation is only apparent in Italy because they control the large majority of non bank financial intermediaries, such as mutual investment funds.

Like deposits, securities other than shares also decreased in importance in the household portfolio in most countries, increasing only between 2000 and 2003, when the stock market declines induced households to move towards safer assets. The share of securities in the household financial portfolio is highest for Italy among the seven countries examined. In Italy, the composition of the securities held changed substantially in the last ten years, with a fall in the share of central government securities and an increase in that of bonds issued by banks.

Shares and other equity is a heterogeneous item that includes quoted shares, unquoted shares, other equity and mutual fund units. Between 1995 and 2000 quoted shares and mutual fund units increased in all the countries, because of the stock market booms. The increase was particularly large in Italy and Spain.<sup>11</sup> Quoted shares and mutual fund units were hit by the stock market downturns between 2000 and 2003 and boosted by the subsequent resurgence of shares.

In the light of the crisis of public pension schemes and of the ageing of the population, insurance technical reserves rose in all countries. As expected, the rise was intense in countries, like Italy, where private pension funds and insurance companies' business were small ten years ago. In the UK, households invest more than 50 per cent of their portfolio in insurance technical reserves. As underlined by the OECD (2005), the British pension system combines one of the least generous state pension schemes of the industrialised countries with one of the most developed systems of voluntary private pensions. Recent progress notwithstanding, Italian and Spanish households are still lagging behind in their holdings of these instruments (see Cesari, Grande and Panetta, 2007 for an analysis of pension funds).

In the last few years the reallocation of household portfolios in favour of riskier instruments is confirmed by the flows of financial assets (Table 4), which are not influenced by valuation effects. In most countries the largest flows regarded investment in insurance technical reserves, flows that were always positive in the last ten years. On the contrary, flows of deposits and, above all, securities other than shares were smaller and

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<sup>10</sup> We ignore the analysis of trade credit because data on this item are not harmonized.

<sup>11</sup> See Filippa and Franzosi (2001) and Bartiloro and De Bonis (2005) on the Italian experience.

sometimes even negative. The flows of shares and other equity were linked to the trend of the stock exchanges.

Table 3

**Household financial assets composition**  
(percentages with respect to total assets)

Countries and years	Deposits	Securities other than shares	Shares and other equity			Insurance technical reserves	Other assets
				of which quoted shares	of which mutual funds		
<b>Italy</b>							
1995.....	38.5	24.8	23.0	3.9	3.8	9.6	4.0
2000.....	22.9	17.1	45.8	10.2	15.4	11.0	3.1
2003.....	25.3	20.3	36.4	6.8	11.0	15.0	3.0
2006.....	25.7	18.2	36.4	8.1	8.3	16.6	3.2
<b>France</b>							
1995.....	41.5	5.9	24.3	3.6	13.4	24.0	4.4
2000.....	33.3	2.9	29.7	5.0	11.3	29.8	4.3
2003.....	33.8	1.9	26.0	3.2	10.6	33.4	4.8
2006.....	29.1	1.4	29.4	4.5	9.4	35.4	4.6
<b>Germany</b>							
1995.....	42.4	11.8	18.2	<i>n.a.</i>	7.2	26.5	1.1
2000.....	34.2	9.0	27.4	7.4	11.3	28.1	1.3
2003.....	35.8	9.9	22.9	4.0	11.9	29.9	1.4
2006.....	33.9	10.6	24.5	5.1	11.6	29.9	1.0
<b>Spain</b>							
1995.....	50.8	3.6	29.9	5.0	10.1	10.0	5.8
2000.....	39.8	2.5	40.4	11.1	13.7	13.9	3.5
2003.....	39.2	3.0	39.7	7.8	12.3	15.0	3.1
2006.....	38.1	2.4	41.8	8.8	12.1	14.1	3.6
<b>United Kingdom</b>							
1995.....	23.7	2.1	19.8	8.7	3.7	50.6	3.7
2000.....	20.3	1.5	23.1	10.2	4.9	52.2	2.9
2003.....	27.0	1.6	15.6	6.9	4.1	52.5	3.3
2006.....	26.2	1.0	14.3	5.9	4.1	55.5	3.0
<b>United States</b>							
1995.....	13.3	9.7	44.9	<i>n.a.</i>	8.4	30.9	1.1
2000.....	10.3	6.5	50.2	24.4	11.6	31.4	1.6
2003.....	12.9	7.2	44.7	16.7	11.9	33.4	1.8
2006.....	12.7	7.1	45.3	13.2	14.4	33.0	1.9
<b>Japan</b>							
1995.....	49.4	7.9	13.5	6.7	2.4	25.2	4.0
2000.....	53.4	4.8	10.9	5.5	2.6	26.2	4.7
2003.....	54.4	3.5	12.0	5.9	2.4	25.7	4.4
2006.....	50.3	8.1	11.5	6.8	<i>n.a.</i>	25.1	5.0

Source: See the Statistical Appendix.

Between 1995 and 2000, Italian households increased their holdings of investment fund units to a much greater extent than households in the other countries. By contrast, subsequent disaffection with the stock market, bank funding policies and relatively high commissions contributed to smaller flows of investment funds in Italy.

In the following sections we will provide further details on each financial instrument present in household portfolios.

Table 4

**Household financial assets flows**  
(transactions with respect to GDP)

Countries and years	Deposits	Securities other than shares	Shares and other equity		Insurance technical reserves	Other assets
				of which mutual funds		
<b>Italy</b>						
1995-1997.....	1.2	1.7	3.9	3.9	2.0	0.2
1998-2000.....	-0.1	-2.7	8.0	8.0	3.1	0.1
2001-2003.....	2.6	3.6	-0.1	0.1	3.4	-0.1
2004-2005.....	3.2	1.3	0.9	0.1	3.9	0.1
<b>France</b>						
1995-1997.....	3.6	-0.6	-1.5	-1.7	5.2	0.3
1998-2000.....	1.5	-0.4	0.3	0.7	4.3	0.4
2001-2003.....	1.9	-0.3	1.4	0.6	3.8	0.5
2004-2005.....	2.4	0.1	0.7	-0.2	5.0	0.6
<b>Germany</b>						
1995-1997.....	2.1	0.6	1.1	0.7	3.2	0.1
1998-2000.....	0.4	-0.2	3.1	2.1	3.3	0.2
2001-2003.....	2.5	0.6	0.1	1.8	2.4	0.2
2004-2005.....	2.1	1.0	0.2	0.3	2.6	0.1
<b>Spain</b>						
1995-1997.....	1.9	0.1	5.3	5.1	2.2	-0.4
1998-2000.....	4.9	0.1	0.2	-0.1	2.7	0.6
2001-2003.....	4.0	0.2	1.4	1.1	2.1	-0.2
2004-2005.....	5.2	0.2	1.9	1.6	1.8	0.5
<b>United Kingdom</b>						
1995-1997.....	4.1	0.0	-0.8	0.5	4.3	0.4
1998-2000.....	3.4	0.1	-1.7	0.9	3.2	0.5
2001-2003.....	4.8	0.1	0.7	0.5	3.5	0.1
2004-2005.....	5.3	0.0	-0.8	0.1	4.2	0.5
<b>United States</b>						
1995-1997.....	1.2	0.4	0.7	2.9	2.9	0.2
1998-2000.....	1.4	0.1	-2.2	2.5	3.2	0.1
2001-2003.....	2.9	0.1	-0.6	1.7	2.7	0.3
2004-2006.....	3.2	1.1	-1.5	2.6	1.7	0.4
<b>Japan</b>						
1995-1997.....	6.2	-0.8	0.1	0.1	3.5	0.1
1998-2000.....	3.8	-0.7	0.1	0.8	2.0	-0.2
2001-2003.....	2.1	-1.2	-0.3	-0.2	0.2	-0.2
2004-2005.....	-0.8	2.5	0.1	1.4	2.5	-0.8

Source: See the Statistical Appendix.

#### 4. Deposits

Countries differ with regard to the importance of transferable and non-transferable deposits (Table 5). In 2006 Italy and the UK are the only countries where transferable deposits, consisting mainly of current accounts, outweigh non-transferable ones. A first explanation is that transferable deposits have always been remunerated in these two countries, while this was not always the case in other financial systems. For example in France, where transferable deposits have a low weight in the household portfolio, remuneration of current accounts was forbidden by law until 2006; in the US, transferable

deposits are negligible given the strong competition coming from money market funds since the 1960s. A second explanation refers to the characteristics of the banking systems: non-transferable deposits are important not only in France but also in Germany and Japan, where relationship banking and the predominance of long-term loans induced banks to issue deposits with a long agreed maturity. By contrast, in the last few years long-term deposits have not been favoured by the fiscal regime in Italy and have been replaced by bank securities.

Table 5

**Household deposits**  
(percentages of household total financial assets)

Countries and years	Deposits		
	Total	Transferable	Non transferable
<b>Italy</b>			
1995 .....	36.1	15.6	20.5
2000 .....	20.9	11.9	9.0
2003 .....	23.4	13.9	9.5
2006 .....	23.4	14.0	9.4
<b>France</b>			
1995 .....	39.2	10.2	29.0
2000 .....	31.6	8.5	23.1
2003 .....	32.6	8.5	24.1
2006 .....	28.0	7.8	20.2
<b>Germany</b>			
1995 .....	39.9	6.8	33.1
2000 .....	32.2	7.4	24.8
2003 .....	33.3	10.2	23.1
2006 .....	30.7	10.3	20.4
<b>Spain</b>			
1995 .....	43.8	5.6	38.2
2000 .....	34.7	5.6	29.1
2003 .....	34.7	6.0	28.7
2006 .....	33.2	16.4	16.8
<b>United Kingdom</b>			
1995 .....	22.8	20.0	2.8
2000 .....	19.5	17.5	2.0
2003 .....	25.9	23.6	2.3
2006 .....	25.2	23.1	2.1
<b>United States</b>			
1995 .....	13.3	2.4	10.8
2000 .....	10.2	0.8	9.4
2003 .....	12.9	0.8	12.0
2006 .....	12.7	0.3	12.4
<b>Japan</b>			
1995 .....	47.6	6.4	41.2
2000 .....	51.0	9.2	41.8
2003 .....	51.7	13.9	37.7
2006 .....	47.5	15.1	32.4

Source: See the Statistical Appendix.

A third explanation refers to institutional factors. In the euro-area banking systems there are differences in product characteristics and business practices, with special reference to the degree of liquidity and the return structure of deposits<sup>12</sup> (ECB, 2006). For example deposits redeemable with a period of notice of more than 3 months are offered

<sup>12</sup> Affinito and Farabullini (2006) show that many differences between bank interest rates in the euro area diminish after controlling for country-specific demand and supply-side factors affecting the characteristics of the banking systems.



only in Germany. In some European countries, customers become eligible for a mortgage after they have invested for a certain period in a long-term saving product. Repos are important mostly in Italy, because of the large availability in the economy of securities other than shares.

## 5. Shares and other equity

As we stressed in Section 3, this is a heterogeneous item including three different instruments: quoted shares, unquoted shares and other equity (see Section 6 on mutual funds).

Quoted shares and mutual funds, on the one hand, and unquoted shares and other equity, on the other, may be substitutes. If private business is important in the household portfolio, investments in quoted shares and mutual funds might be consequently low. In a place like Italy, where small family-run firms predominate, households have a lot of unquoted equity in their portfolios, which might “crowd out” other forms of equity investment. Heaton and Lucas (2000) emphasized that wealthy households face entrepreneurial risk through holdings of business assets. Following this argument, countries where unquoted shares and other equity are sizeable might have low levels of quoted shares.

The issue is difficult to study because there are complex statistical problems concerning the method of estimating unquoted shares and other equity. International organizations, such as Eurostat and the OECD, have set up task forces to discuss common methodologies for estimating unquoted shares (see Durant and Massaro, 2004). Rodano and Signorini, in this volume, present estimates of household private business in Italy. Up to now, only some countries are able to provide details on the amounts of quoted shares, unquoted shares and other equity.

On the basis of the available evidence (Table 6), unquoted shares and other equity are especially important in countries where small firms prevail, such as Italy and Spain, while they are less important in the UK, where traditionally larger corporations are predominant. However, unquoted shares and other equity are also large in France, notwithstanding the progress of formal financial markets in that country. The possible contrast between the different types of shares and other equity appearing in household portfolio is a subject that merits further analysis.

Table 6

### Household quoted shares, unquoted shares and other equity in 2006 (percentages of the total)

	Italy	France	Germany	Spain	United Kingdom
Quoted shares .....	28.6	22.4	39.7	30.1	76.8
Unquoted shares .....	51.7	60.9	24.1	57.1	22.9
Other equity .....	19.7	16.7	36.2	12.8	0.4

Source: See the Statistical Appendix.

## 6. Mutual fund units

Mutual fund units also deserve a specific analysis. There are many ways to classify mutual funds and a consensus was not reached on what it is the best taxonomy.<sup>13</sup> In Italy, as in other countries, a first distinction is drawn between open-end investment funds and closed-end funds: the former are largely prevalent in our country, with a market share of 95 per cent. Most open-end funds are dedicated to small retail investors. When regulated by the European directives, these funds are called harmonized and account for as much as 80 per cent of total mutual funds in Italy. Other open-end funds include funds reserved to qualified investors (with a market share of 9 per cent) and hedge funds. Italian hedge funds were introduced in 2001 and experienced strong growth in recent years, reaching a market share of about 6 per cent of total mutual funds.

Table 7

**Mutual funds by investment policy**  
(percentages of the total mutual funds)

	IT			
	1999	2000	2003	2006
Equity funds .....	32.7	37.4	25.8	23.2
Bond funds .....	58.6	49.4	55.7	41.4
Mixed funds .....	8.7	13.2	18.4	35.4
	FR			
	1999	2000	2003	2006
Equity funds .....	33.5	34.1	28.1	36.1
Bond funds .....	29.5	26.0	31.7	24.3
Mixed funds .....	37.1	39.9	40.1	39.7
	ES			
	1999	2000	2003	2006
Equity funds .....	13.6	20.2	12.4	13.1
Bond funds .....	57.4	50.5	72.2	76.6
Mixed funds .....	29.0	29.3	15.4	10.3
	DE			
	1999	2000	2003	2006
Equity funds .....	25.9	27.3	20.7	22.1
Bond funds .....	27.4	26.1	31.8	27.2
Mixed funds .....	46.6	46.7	47.5	50.7

Source: See the Statistical Appendix.

Close-end funds invest in real estate or securities; their market shares were respectively 4 per cent and 1 per cent at the end of 2006. Funds investing in real estate assets benefited from the recent increase in house prices. Closed-end investment funds buying securities are still marginal in Italy: they invest mainly in unquoted shares of young firms and are comparable to venture capital companies and private equity firms.<sup>14</sup>

<sup>13</sup> Money market funds (MMFs) are not included in the population of mutual funds. Following ESA95 and the the ECB Regulations on monetary and banking statistics, MMFs are classified as monetary financial institutions.

<sup>14</sup> See Generale and Panetta (2007) on private equity.

International harmonized statistics on hedge funds and closed-end funds are not available.<sup>15</sup> It is easier to look at the breakdown of retail open-end funds according to their investment policy (Table 7). Bond mutual funds are particularly important in Italy, given the large availability of banking and government securities, while equity funds are more common in other countries with larger financial markets, for example in the UK. As already anticipated in Section 3, Italian retail open-end mutual funds lost market share in the last few years, especially in the segment of bond funds. The reforms to improve the Italian asset management industry are an important point in the policy agenda.

## 7. Pension funds and insurance corporations

While in Section 3 we commented the aggregated insurance technical reserves, in this Section we distinguish between pension funds and insurance firms.

In the last ten years reforms of public pension schemes were at the origin of households' increased investments in pension funds in all countries (table 8). The largest stocks are found in the UK and the US; intermediate levels are registered in Japan and Germany, while low levels prevail in Spain, France and, especially, Italy.<sup>16</sup>

The institutional architecture of pension funds is different in each country and fully harmonized statistics do not exist yet. As in the case of mutual funds, there are several possible classifications. A first example is the distinction between autonomous and non-autonomous funds. The former are managed by financial intermediaries or other managers to provide incomes for employees on retirement; the latter are funds set up by employers, for example large industrial corporations and banks, to offer pensions to their employees. Autonomous pension funds are predominant in all countries, with the exception of Germany, where non-autonomous pension funds are a component of the German system of corporate governance.

A second distinction is between defined benefit plans, where the risk is borne by the unit which is responsible for portfolio management, and defined contribution plans, where the risk is mainly borne by the individual. There is a general trend towards an increase in defined contribution schemes. The latter are still a minority in Italy, France and Spain, while they are more common in the UK, the US and Japan.

Not only is the incidence of pension funds different in each country but so is the composition of their assets. This asset mix reflects the development of financial markets in each nation. While securities issued by general government are one of the predominant choices in the majority of countries, investments in deposits, land and real estate are important in Italy, while shares are preponderant in the UK.

Even if it is not always easy to separate the business of pension funds from the insurance corporations activity, insurance corporations' reserves are larger than those of pension funds in most of the OECD countries, with the notable exception of the US. Focusing our attention on life insurance products a common distinction is between unit-linked and non-unit-linked instruments. In unit-linked life insurance reserves, the return of the capital invested is linked to the performance of an index or a financial portfolio and the risk is borne by the subscriber. Non-unit-linked life insurance reserves are instruments that ensure a guaranteed rate and the risk is borne by the insurance company. Especially

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<sup>15</sup> In 2009 the Eurosystem will collect harmonized statistics on investment funds on the basis of a Regulation approved in 2007.

<sup>16</sup> Italian households hold other pension plans (severance pay provision) traditionally managed internally by firms and therefore not included in table 8 but reckoned in total household financial assets (Tables 1-4).

during the stock market boom of the period 1995-2000 the tendency has been towards an increase of unit-linked contracts. They remain, according to OECD statistics, notably important in the UK (Table 9).

Table 8

**Household holdings of pension funds reserves**  
(percentages of household total financial assets)

Countries and years	Managed by autonomous pension funds			Managed by non-autonomous pension funds	Insured pension plans	Total
		Defined contribution	Defined benefit			
<b>Italy</b>						
1995.....	0.7	0.7	-	0.4	n.a.	1.1
2000.....	0.6	0.6	-	0.2	n.a.	0.8
2003.....	0.8	0.8	-	0.1	n.a.	0.9
2006.....	1.0	1.0	-	0.1	n.a.	1.1
<b>France</b>						
1995.....	1.4	1.0	0.4	-	-	1.4
2000.....	1.8	0.8	1.0	-	-	1.8
2003.....	2.2	1.3	0.9	-	-	2.2
2005.....	2.3	1.3	1.0	-	-	2.3
<b>Germany</b>						
1995.....	4.5	n.a.	n.a.	6.1	-	10.6
2000.....	4.9	n.a.	n.a.	5.4	-	10.3
2003.....	5.2	n.a.	n.a.	5.8	-	11.0
2005.....	n.a.	n.a.	n.a.	n.a.	-	n.a.
<b>Spain<sup>1</sup></b>						
1995.....	2.1	1.3	0.0	1.4	1.0	4.5
2000.....	3.7	2.6	0.1	1.2	0.9	5.8
2003.....	4.5	3.1	0.1	0.7	1.0	6.2
2005.....	4.7	n.a.	n.a.	0.6	0.9	6.2
<b>United Kingdom</b>						
1995.....	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2000.....	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2003.....	n.a.	n.a.	n.a.	n.a.	n.a.	23.6
2005.....	n.a.	n.a.	n.a.	n.a.	n.a.	25.7
<b>United States</b>						
1995.....	22.4	6.9	15.5	-	4.1	26.6
2000.....	23.1	7.9	15.2	-	4.6	27.7
2003.....	22.2	7.5	14.8	-	5.4	27.7
2005.....	n.a.	n.a.	n.a.	-	n.a.	28.7
<b>Japan</b>						
1995.....	n.a.	n.a.	n.a.	n.a.	n.a.	7.6
2000.....	n.a.	n.a.	n.a.	n.a.	n.a.	9.5
2003.....	n.a.	n.a.	n.a.	n.a.	n.a.	9.8
2004.....	n.a.	n.a.	n.a.	n.a.	n.a.	10.1

<sup>1</sup> Spanish households hold hybrid plans managed by autonomous pension funds representing 0.7, 1 and 1.4 per cent of their total financial assets in 1995, 2000 and 2003 respectively (2005 not available).

Source: See the Statistical Appendix.

## 8. On household debt

Household debt development is often interpreted as an improvement in the degree of market efficiency. Complete and efficient markets make it easier for individuals to smooth their consumption path along the life cycle. At the same time an excessive

household indebtedness may have negative effects on financial stability and the business cycle, especially if the debt service is too high.

Households' propensity to borrow varies across countries with many factors: cultural attitudes, such as the moral judgement on debt prevailing in society; the scale of the tax deductibility of interest expenses; the types of loans available according to the different contractual conditions, such as the alternative between fixed and variable rates, the average duration, the restrictions and fees on early repayment, the prevalent loan to value ratio, and the possibility of refinancing loans if house prices rise; and the efficiency of the legal system in ensuring that creditors may recover their loans if debtors become insolvent (see ECB, 2002 and Campbell, 2006).

Table 9

**Household insurance reserves**  
(percentages of household total financial assets)

Countries and years	Life insurance reserves			Total insurance reserves
		Unit-linked	Non unit-linked	
<b>Italy</b>				
1995.....	3.1	n.a.	n.a.	4.3
2000.....	5.5	1.7	3.8	6.9
2003.....	8.7	3.4	5.2	10.5
2006.....	10.1	3.7	6.4	12.1
<b>France</b>				
1995.....	19.5	1.6	17.8	22.6
2000.....	25.5	5.5	19.9	28.1
2003.....	28.4	4.8	23.6	31.2
2005.....	29.6	5.0	24.6	32.2
<b>Germany</b>				
1995.....	14.0	0.1	13.9	16.0
2000.....	16.0	0.3	15.7	17.8
2003.....	17.1	0.4	16.7	18.9
2005.....	n.a.	n.a.	n.a.	n.a.
<b>Spain</b>				
1995.....	4.5	0.0	4.5	5.6
2000.....	6.8	1.3	5.5	8.0
2003.....	7.7	0.7	7.0	9.1
2005.....	7.0	0.6	6.4	8.5
<b>United Kingdom</b>				
1995.....	28.0	12.0	16.0	n.a.
2000.....	29.0	12.0	17.0	n.a.
2003.....	27.8	12.5	15.3	29.0
2005.....	27.5	12.3	15.2	28.5
<b>United States</b>				
1995.....	2.6	1.1	1.5	4.1
2000.....	2.5	1.4	1.1	3.6
2003.....	3.0	1.7	1.3	5.7
2006.....	2.8	1.6	1.2	4.4
<b>Japan</b>				
1995.....	17.7	-	17.7	17.7
2000.....	16.6	-	16.6	16.6
2003.....	15.9	-	15.9	15.9
2004.....	15.7	-	15.7	15.7

Source: See the Statistical Appendix.

As we showed in Section 2, household debt as a percentage of disposable income increased in the main OECD countries. However countries differ in terms of the level and rate of change of household liabilities. The highest levels are found in the UK, Japan and, to a lesser extent, the US.

In the UK the rate of growth has been significant since 2000, favoured by intense banking competition and the diffusion of mortgage equity withdrawal (MEW). MEW takes place when households increase their borrowing secured on housing assets devoting the funds to home improvements and consumption (Bank of England, 2003; Walton, 2004). The increase in debt has been slower in Japan, where household debt was already high in the 1980s and subsequently suffered from the recession of the economy.

In the US the growth of household debt was more similar to that in the UK, with an acceleration around the end of the 1990s, using home equity as collateral (Federal Reserve Board of Governors, 2001). A large body of literature has long claimed that a broader availability of financial instruments is an underpinning of macroeconomic stability. The decline in the volatility of the US business cycle has been linked to the drop of the correlation between housing investments and the other components of effective demand. The last two US recessions, in 1991 and 2001, were characterized by an increase in household leverage, which contrasts with the four previous US recessions (Mojon, 2007). Of course there is now concern that the subprime crisis will reverse the positive link between financial innovation and household debt.

In continental Europe household liabilities are lower than in the UK, Japan and the US, even if the growth in Spain was fast. In general, financial innovation is likely to influence the links between real assets and consumption differently in countries like the US and the UK, on the one hand, and in countries where more traditional debt arrangements prevail, on the other. In fact the diffusion of MEW is still limited in the euro area.<sup>17</sup> Another example are reverse mortgages: while they are common in the US and in the UK, they are rare in Italy, where a law on the subject was approved in 2005.

A possible way to distinguish between the different forms of household debt is to split it between consumer credit, loans for house purchase and other loans, mainly granted to producer households. Notwithstanding the recent strong growth, in 2005 in Italy consumer credit was 3.1 per cent of GDP, against 7.6 per cent in Germany, 8.3 per cent in France and 8.5 per cent in Spain.<sup>18</sup> The same is true for mortgages, which were 15.3 per cent of GDP in Italy, against 42.8 per cent in Germany, 49.3 per cent in Spain and 28.8 per cent in France. However, Italy has the highest proportion of other loans over total bank credit (Table 10), reflecting the diffusion of small firms.

The maturity of loans to households is considered important for the possible consequences for financial stability. In fact variable interest rates are more important in some countries than in others. The original maturity of consumer credit probably reflects institutional peculiarities (Table 11): Italy concentrates credit in the bands between 1 and 5 years and over 5 years, while in the other main euro-area countries around 20 per cent of total consumer credit is under 1 year.

As expected, in all the countries lending for house purchase concentrates in the maturity band over 5 years (Table 12). With respect to other loans to households, Italy is the country with the highest incidence of loans up to one year (Table 13), because of the widespread use of overdrafts as the technical means of granting credit to small, and often opaque, firms.

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<sup>17</sup> The Netherlands are a notable exception (see DNB, 2003).

<sup>18</sup> We restrict the analysis to the large euro area countries, using harmonized Eurosystem data. On consumer credit in Italy see, for example, Cau and Salvio (2007) and Piazza and Stacchini (2007).

Table 10

**Composition of household debt**  
(percentages)

Country	Consumer credit		Lending for house purchase		Other lending	
	2002	2006	2002	2006	2002	2006
ES.....	15.2	12.3	66.5	72.9	18.3	14.8
DE.....	15.9	11.6	64.9	67.8	19.3	20.5
FR.....	22.2	12.6	63.9	81.3	13.9	6.2
IT.....	10.1	11.6	46.6	56.7	43.3	31.7

Source: See the Statistical Appendix.

Table 11

**Consumer credit by original maturity**  
(percentages)

Country	Up to 1 year		From 1 to 5 years		Over 5 years	
	2002	2006	2002	2006	2002	2006
ES.....	17.2	17.8	36.8	33.1	46.0	49.1
DE.....	19.4	18.5	20.7	25.4	59.9	56.1
FR.....	15.6	21.4	55.6	48.7	28.8	29.9
IT.....	4.7	2.1	67.2	56.3	28.2	41.6

Source: See the Statistical Appendix.

Table 12

**Lending for house purchase by original maturity**  
(percentages)

Country	Up to 1 year		From 1 to 5 years		Over 5 years	
	2002	2006	2002	2006	2002	2006
ES.....	0.4	0.3	2.2	1.6	97.4	98.1
DE.....	0.9	0.6	3.4	3.1	95.7	96.3
FR.....	0.4	0.3	2.7	1.8	96.9	97.9
IT.....	0.2	0.1	3.4	1.6	96.4	98.3

Source: See the Statistical Appendix.

Table 13

**Other lending to households by original maturity**  
(percentages)

Country	Up to 1 year		From 1 to 5 years		Over 5 years	
	2002	2006	2002	2006	2002	2006
ES.....	19.5	18.8	21.5	18.1	59.0	63.1
DE.....	19.5	13.8	9.2	8.6	71.3	77.6
FR.....	13.4	8.8	10.7	7.9	75.9	83.3
IT.....	40.2	33.3	29.6	24.6	30.2	42.1

Source: See the Statistical Appendix.

## 9. Conclusions

This paper compared household wealth in a group of selected OECD countries. On the basis of new statistics produced by the Bank of Italy, we confirmed the picture presented in Bartiloro *et al.* (2006). As far as financial wealth is concerned, Italy occupies an intermediate position among the main OECD countries. Financial assets are not as large as in the US, the UK or Japan, but are larger than in other European countries. This Italian peculiarity derives from the greater importance of securities other than shares and unquoted shares and other equity in the household portfolio, while insurance technical reserves are small by international standards. Italy has one of the highest ratios of real wealth to disposable income, together with the UK and France. Taking into account that household debt is low in Italy, Italian household net wealth is one of the highest among the main OECD countries.

Pending further harmonization of statistics on financial and, especially, real wealth, two economic applications seem particularly promising. First, we do not have many analyses on why countries have different levels of household financial and real wealth. Among the possible determinants and control variables we include the situation of pay-as-you-go public pension systems, citizens' direct and indirect participation in financial markets, legal origin of finance, saving rates, trust, taxation, weight of the shadow economy, average size of firms, and regulatory and institutional variables.<sup>19</sup> Second, financial accounts data can be used to measure financial assets in studies that analyse the wealth effect. These contributions often draw distinctions between real and financial wealth, but in most of the literature household financial assets are approximated by rough measures, such as stock market capitalization, and without distinguishing between the different instruments making up households' portfolio.<sup>20</sup> These two subjects are in our research agenda.

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<sup>19</sup> On some of these subjects see La Porta *et al.* (1998), Guiso, Haliassos and Jappelli (2003), and Zingales (2007).

<sup>20</sup> Dreger and Reimers (2007) claim that "comprehensive wealth indicators .... on houses, lands, bonds, companies, and stocks, are not available. Instead, wealth is proxied by the stock market index".



## STATISTICAL APPENDIX

The household sector includes non-profit institutions serving households. Gross disposable income is used to compute the ratios in tables 1 and 2. For Japan the time span is shorter: gross disposable income is not available for the years 1995 and 2005.

### *Financial assets and liabilities*

*Tables 1 and 2.* For European countries, data are based on the European System of Accounts 1995 (ESA95), for Japan and the United States (US) on the United Nations' System of National Accounts 1993 (SNA93). Statistics refer to the outstanding amounts at the end of the year. Data are not consolidated (i.e. they include transactions between units belonging to the household sector). For the European countries, the data source is the annual financial accounts database (November 2007 release) available on the Eurostat website, with the following exceptions:

- a) total financial assets for the Italian households include new estimates for loans to co-operatives and for equity in non-financial quasi-corporations. Figures for trade credits and debts have also been substantially revised;
- b) financial information for the United Kingdom in the Eurostat database are in euros, while the gross disposable income released by the Office of National Statistics (ONS) is available only in British pounds. To avoid any assumptions on exchange rates, the UK household financial statistics are taken from the OECD's financial accounts database. Data for 2005 (revisions) and 2006 (updates) are taken from the ONS "Financial statistics" bulletin of November 2007 (pages 224-225).

Data for the US are taken from OECD's database. Statistics correspond to those published in the Federal Reserve's Flow of Funds Accounts bulletin of June 2007. OECD provides a reclassification of the financial instruments consistent with the format used by Eurostat and based on the ESA95 criteria, allowing international comparisons. Japan data until 2005 are taken from the OECD's database. The source for the year 2006 is the November 2007 version of the Japan's Flow of Funds available on the Bank of Japan website.

*Tables 3 and 4.* Deposits include currency. Securities other than shares include short and long-term securities and financial derivatives (whose amount is, however, negligible). Insurance technical reserves include life and non-life insurance claims and net equity in pension fund reserves. For Italy, retirement allowances are included (*trattamento di fine rapporto*). "Other assets" is a miscellaneous item: ESA95 rules (paragraph 5.120) indicate that this item includes financial claims deriving from a timing difference between the moment in which the transaction takes place and the corresponding payment. Trade credits are classified in this item. In light of their negligible amounts, loans granted by households are included in this category in France, Italy (loans to co-operatives), and Spain (only for 1995). Loans granted by households are similarly included in this residual category in Japan and in the US (corresponding to the sum of mortgages and security credit published in the Fed's Flow of Funds accounts of 7 June 2007, table L100, page 62). In table 4, flows are different from changes in stocks as revaluations and other changes in volume are not included. The ratio for each period (e.g., 1995-1997) has been calculated as the average ratio for each year considered (e.g. 1995, 1996 and 1997).

*Table 5.* In this table, unlike the previous ones, deposits do not include currency. For the European countries, deposits are broken down according to ESA95 categories: transferable deposits and other deposits. Transferable deposits are those immediately

convertible into currency or transferable by payment means (e.g. cheques) without any kind of significant restriction or penalty. The US transferable deposits correspond to the item “Checkable deposits and currency” in the Federal Reserve’s Flow of Funds (June 2007). The deposit breakdown for 2006 in Japan has been computed using the information in the flow of funds accounts (November 2007).

*Table 6.* In this table, shares and other equity include quoted shares, unquoted shares, and other equity. The aggregate is not fully comparable across countries because the criteria adopted for the valuation at market prices of unquoted shares and other equity differ. For Germany, the weight of quoted shares is partially estimated using ECB data. As of 2004 Spain statistics include shares issued by investment companies. Quoted shares held by English households are taken from the ONS. For the US, quoted shares are approximated by the holdings of corporate equities published in the Flow of Funds accounts. For Japan, quoted shares correspond to the sub-item “shares” published in the Bank of Japan Flow of Funds (see the Guide to the Flow of Funds, page 66, available on the Bank of Japan website).

*Table 7.* Data are taken from the quarterly statistics on mutual funds transmitted by the national central banks to the European Central Bank.

*Tables 8 and 9.* The tables on pension funds and insurance companies are produced since 2005 by the OECD in the framework of national financial accounts. Definitions are consistent with SNA93 and ESA95. However, information available has yet to be fully harmonized.

*Tables 10-13.* These data derive from the monetary financial institutions balance sheets that the national central banks send to the ECB for the calculation of the euro area monetary and credit aggregates.

#### *Non-financial wealth*

Figures are computed according to different methodologies. For Italy, new estimates produced by the Bank of Italy have been used. Durable goods are not included. Unlike financial data and gross disposable income statistics, real wealth data do not include non profit institutions serving households. For France, Germany, Japan and US, data are taken from the tables on household assets available on the OECD website. For the UK, ratios are directly taken from the Annex table 58 (Household wealth and indebtedness) of the OECD Economic Outlook (June 2007, n. 81, page 298).

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**DISCUSSION OF THE PAPER BY L. BARTILORO,  
M. COLETTA AND R. DE BONIS**

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Household wealth remains one of the most difficult variables to measure, hence one of the most mysterious and unexplored in economics. Nevertheless, its importance has become clearer and clearer. Any dynamic model has agents who base their consumption plans on the sum of their future expected incomes – which is simply wealth. And perceived changes in household wealth are crucial in the intertemporal transmission of shocks, i.e. in determining cyclical fluctuations. The impact of government policies will differ depending on whether they have “wealth effects” and, as the current global situation shows, abrupt changes in real or financial wealth can threaten financial stability and economic activity.

The provision of new and more accurate data on wealth is thus an extremely important contribution, especially when they allow for international comparison. The paper by Bartiloro, Coletta and De Bonis is invaluable, adding greatly to our knowledge of the Italian economy and its relative position. It is very clear, well-written and full of useful information, and there is little to criticize; so I will offer some further thoughts on the data the authors present and some of the questions they raise.

To my mind, the data point up three interesting peculiarities of the Italian economy. First, together with the UK, Italy has the highest level of wealth relative to disposable income, about a third greater than in the US or Germany. This warrants careful interpretation. In my view, the phenomenon can be better understood by considering a slightly different decomposition of wealth than the paper suggests and distinguishing between net financial wealth and non-financial wealth.

The net financial wealth of Italian households is on a par with American and British, at around 3 per cent of disposable income, higher than in Germany and France. This finding is somewhat surprising, given the consensus view that Italian households are financially backward compared with the rest of the industrial world. It also raises interesting questions on the determinants of financial development. Is the high ratio of financial wealth to disposable income due to the liberalization of the Italian financial system in the last two decades, or to other factors?

Moreover, together with the UK and France, Italy also has the highest ratio of non-financial wealth to disposable income. Probably this is due to the high price of real estate, since these three countries are also those with the highest house prices but, again, it poses an interesting problem that has not yet been adequately investigated, especially for Italy. The paper offers a tentative explanation, but given the focus of the work, it is only indicative and needs deeper analysis. Are the house prices and the large investment in real estate the result of some structural feature of the Italian real estate market, such as the scarcity of land, or do they indicate path dependence, i.e. simply the result of the traditional belief of Italian households that real estate is a safe and profitable investment? And what is the role of real estate taxes and rent legislation?

The second important aspect that emerges in the comparison between Italy and other countries is the low level of household debt. Although household debt has doubled relative to personal income since 1995, Italy is well below all the other countries, with

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less than half as much debt as American, Japanese or Spanish households. How should we interpret this phenomenon? On the positive side, the traditional explanation based on liquidity constraints is clearly no longer sufficient. The development of Italian financial markets has eased these constraints to the point that there is no evidence that Italian households face tighter credit constraints. Does this mean that there is a significant difference in household preferences between Italy and the rest of the industrial world? Or is this too the result of some form of path dependence?

From the normative point of view, question is whether Italian households' low level of debt is a positive or a negative feature of the economy. Obviously, the answer depends strictly on the causes of the phenomenon. Liquidity constraints are never good, by the welfare standard, because they impede intertemporal smoothing. On the other hand, if low debt depends on preferences that value future more than current consumption, this is clearly a strength of the Italian economy. It is associated with higher savings rates and, as in the recent macroeconomic turmoil, it reduces aggregate instability.

The third important feature is the low share of deposits in household asset portfolio (only in the US is it lower) and the high weight of securities other than shares and shares and other equity. This too is consistent with the thesis that Italian households have now become financially sophisticated, capable of using the broad array of instruments in global financial markets. Particularly interesting is the amount of shares held by Italian households. If we consider listed shares as a percentage of total shares (Table 6 in the paper), Italy (28.6 per cent) is on a par with Spain and higher than France (22.4 per cent) but definitely below the UK (76.8 per cent). However, if we take shares and other equity as a percentage of total household assets, Italy (at 36.4 per cent) only trails the US (45.3 per cent) and Spain (41.8 per cent) and is well ahead of all the other major countries. And, also looking at the portion of total household assets consisting of listed shares and mutual funds, Italy (16.4 per cent) is behind the US (27.6 per cent) and Spain (20.9 per cent) but basically equal to Germany (16.7 per cent) and ahead of France (13.9 per cent) and the UK (10 per cent). These data indicate that Italian households have a reasonably strong propensity to invest in the stock market. At the same time, however, Italian firms are still, in large part, closely held; and the few families that own the majority or controlling stake in a company tend not to go public. The obstacles to a more open and developed financial market, therefore, do not appear to depend on ordinary investors who are actually quite interested in allocating part of their wealth to stocks or mutual funds but rather on the family ownership structure that has traditionally characterized Italian capitalism and that represents a widely recognized historical problem of the Italian economy.

Concluding, the new data presented by Bartiloro, Coletta and De Bonis draw a picture of the wealth of Italian households that is quite complex and belies the stereotype. Italian households do have a high propensity to hold "real assets" – mainly real estate – but at the same time they are quite sophisticated investors, eager to exploit the investment opportunities offered by financial markets. The rising but still limited propensity for debt is certainly an important factor for the stability of the Italian economy.



## THE REAL AND FINANCIAL WEALTH OF ITALIAN HOUSEHOLDS BY REGION

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### 1. Introduction

In this paper we provide new estimates of the real and financial wealth of Italian households by region from 1998 to 2005, following the methodology of Cannari, D'Alessio and Paiella (2006) who used regional series to break down the national figures in order to obtain territorial data.<sup>1</sup> With respect to the earlier literature, we have introduced several methodological improvements. First, our estimates are more comprehensive: new, previously neglected, components of real and financial wealth are now estimated and included in overall wealth. To real wealth we added the physical capital, inventory and goodwill of producer households, while regional estimates of financial wealth now include insurance and pension fund reserves, trade credits, shareholders' loans to co-operative societies and shares in quasi-corporations.<sup>2</sup> Second, our estimates are more accurate: for example, there was a wide consensus that house prices were overestimated.<sup>3</sup> Our calculations, however, are based on a new series of house prices that have recently become available and avoid this bias.

Our estimates confirm the highly uneven territorial distribution of per capita wealth of the previous analyses. In 2005, the per capita net wealth of Italian households amounted to € 133,500; in the southern regions it was € 83,000, less than 50 per cent of the € 167,900 in the northern regions; in the central regions it was approximately 87 per cent (€ 145,400). The richest regions turn out to be Liguria, Emilia Romagna and Valle d'Aosta; the poorest ones, Puglia, Sicily and Calabria. As regards the distribution of wealth between real and financial assets, real wealth covers the largest share in total net wealth, 58.4 and 67.7 per cent in the North and Centre respectively (against 54.5 and 62.9 in 1998); in the southern regions this share is even larger (70.8 in 2005 against 69.7 in 1998). Between 1998 and 2005 the shares of net wealth of each geographical area remained almost unchanged: 57 per cent of national net wealth is in the North while the remaining 43 per cent is split almost equally between the Centre and the South and Islands.

Compared with the most recent study (Cannari, D'Alessio and Paiella, 2006), the new estimates of per capita net wealth in 2004 are 11.5 and 13.9 per cent lower than the earlier ones in the North and Centre and 3.8 per cent lower in the South and Islands. The fall in the level of wealth is mainly due to new house prices, which on average are below the old ones. The smaller reduction of net wealth in the southern regions depends in part on the larger contribution in this area of some new components of wealth, such as

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<sup>1</sup> See also Cannari, D'Alessio and Venturini (2003).

<sup>2</sup> The national aggregates concerning the last three items have only recently been included in the Financial Accounts statistics (see Banca d'Italia, 2007).

<sup>3</sup> See Cannari and Faiella in this volume.

producer households' capital.<sup>4</sup>

The remainder of the paper is organized as follows. In section 2 we provide a synthetic description of the methodology used to calculate households' wealth by region and compare our estimates with those provided by Cannari, D'Alessio and Paiella (2006). In section 3 we discuss the territorial distribution, composition and evolution over time of households' wealth.

## **2. Methodology**

### *2.1 Calculation of real wealth by region*

In order to obtain the estimates of the real components of wealth by region appropriate economic series have been used to break down the individual components available at national level.

Real wealth comprises four main elements: 1) dwellings; 2) lands; 3) the stock of physical capital (non-residential construction, plants, machinery and equipment), inventory and goodwill of the producer households<sup>5</sup> and 4) valuables. We also calculated the value of durable goods which, however, is not included in household wealth. Summarized below are the methods used to obtain, for each component of real wealth, the series to break down the national value by region. More details on the methods and sources of the data are provided in Appendix B.

The market value of dwellings, at current price, is obtained by multiplying the price of houses available at regional level by the stock of dwellings measured in terms of surfaces. For the benchmark year the regional surfaces of houses are obtained by Census data, for the other years we use the regional capital stock in the construction sector calculated using the perpetual inventory method on investment data. It is worth noticing that the procedure does not include houses in Italy owned by non-Italian residents and houses outside Italy owned by Italian residents. We believe that this exclusion has only a negligible effect on our estimates. For example, from 2000 to 2005 total net investment of foreigners in Italian properties, from foreign direct investment data of the Italian Exchange Office, amounted to just 0.096 per cent of the total market value of dwellings. Therefore, we are quite confident that omitting this adjustment only marginally alters our estimation of wealth.

The second main component of real wealth is the stock of physical capital of producer households, which represents an innovation with respect to the previous estimates of households' wealth. This item comprises two components: "non-residential constructions" and "plants, machinery and equipment". For the regional estimate we followed a two-step procedure. First, we estimated the total regional capital stock of producer households (by sector) multiplying the share of producer households<sup>6</sup> over total employment by the stock of physical capital, by region and sector. Then, to break down the regional capital stock into two components, namely "non-residential construction" and "plants, machinery and equipment", we used the corresponding shares of the two

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<sup>4</sup> Tiny firms are more common in the southern regions.

<sup>5</sup> Producer households consist of sole proprietorships and partnerships without independent legal status – other than those treated as quasi-corporations – which are market producers.

<sup>6</sup> The producer households' share is proxied by the share of sole proprietorships, *de facto* companies and ordinary partnerships with no more than 5 employees, based on Istat data (*Census*).

components over the national capital stock based on Istat data.<sup>7</sup>

The values of inventory and goodwill of producer households by region are estimated by breaking down the national series according to the regional share of value added of small businesses. Valuables are estimated based on the stock of durable goods, calculated using the perpetual inventory method for regional consumption data. Finally, data on the value of land are provided at regional level by INEA.

Since the calculation of the stock of physical capital, inventory and goodwill of producer households is a potentially significant methodological innovation, let us provide the results of a first attempt to test the reliability of our estimates. We expected that the capital stock of producer households (including inventory and goodwill) would be positively correlated with self-employment in the region. To evaluate whether the assessment of this new component by region was plausible, we compared the estimated value of per capita wealth in producer households' capital to the share of self-employees over population by region. The results are rather encouraging: the two series turn out to be positively and quite highly correlated, with a cross-region correlation's coefficient of 0.7 in 2005 (similar values are obtained using different years). In the light of these findings we consider our estimations reasonably reliable.

Our new estimates of the real wealth of Italian households by region represent a step forward with respect to the last estimates provided by Cannari, D'Alessio and Paiella (2006). They differ from the earlier ones in two main respects. First, we use a different and more accurate series of dwelling prices that take into account the prices of houses in the smallest municipalities and not only those of the new houses in the provincial capitals. Given the characteristics of the two series, on the whole the new prices are lower than the old ones.<sup>8</sup> Second, the estimates of the stock of physical capital, inventory and goodwill of producer households and of valuables are included in the new estimates of total real wealth.

Because of these methodological innovations, per capita real wealth in Italy in 2004 is approximately 8.4 per cent lower than previously estimated. Overall, the fall in the value of dwellings, due to the new prices, is only partially offset by the introduction of the producer households' capital. The compensation turns out to be relatively stronger in the southern regions where the ratio of small business capital to total wealth is higher.

The new methodological approach also changed the ranking of regions ordered by per capita real wealth. In particular, with respect to the estimates of Cannari, D'Alessio and Paiella (2006) the new ranking changed most significantly for Valle d'Aosta, which rose nine places from the 11<sup>th</sup> to the 2<sup>nd</sup> position; followed by Lombardy, Veneto, Lazio and Campania, which fell back between four and seven positions; and finally Liguria and Trentino-Alto Adige, which gained three positions.<sup>9</sup>

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<sup>7</sup> The national share is calculated as the mean over the time period 1995-2005 based on Istat data (*National accounts*). More details can be found in Appendix B.

<sup>8</sup> We find that in 2004 the new prices are substantially lower than the old ones in all the regions except four (Valle d'Aosta, Trentino-Alto Adige, Liguria and Tuscany).

<sup>9</sup> The large majority of these changes are due to the change in the series of house prices. For example, in 1995 in Valle d'Aosta and Liguria the new prices of dwellings were about forty per cent higher than the old prices, the highest increase across regions. Meanwhile, the group of decreasing regions show a substantial reduction in their house prices with respect to the old ones (between 20 and 30 per cent). In some regions, namely in Valle d'Aosta and Trentino-Alto Adige, the introduction of the new component of real wealth, the capital stock of producer households, partly helped raise their ranking positions. This makes sense: these regions' economy relies mainly on tourism and related activities, where small family businesses play an important role, as clearly shown by the above average ratio of self-employment to population calculated in those industries (16.5 and 15.1 per cent, respectively against 11.9 per cent of the Italian mean).

If we omit the new components of real wealth, the differences in absolute value between new and old estimates increase to 23.8 per cent for Italy as a whole, and to 25.1, 26.9 and 17.3 per cent in the North, Centre, and South and Islands respectively (Table 1).

## 2.2 *Calculation of financial wealth by region*

The method used to calculate regional estimates of the financial wealth of Italian households<sup>10</sup> is based on the identification of financial series as homogeneous as possible to those of the Financial Accounts statistics, and on the application of regional quotas to the national series.

Most of the regional estimates of financial variables are based on data on the financial assets held in custody in bank accounts or in individually managed portfolios, whose source is the Supervisory reports. For some variables other sources have been used. Unlike the Supervisory reports most of these do not cover the entire period of the estimates.

One of the most difficult estimates is pension fund reserves. There are two different types of pension funds: the ones set up before the reform of 1993 and the ones set up after that reform. The regional estimate of pension fund units set up before the reform uses data on the regional distribution of bank branches because most of them are held by bank officials. For the ones set up after the reform geographical distribution data on the subscribers by area are used; finally, for regionalization within areas data on regional disposable income are used.

Insurance fund reserve estimates involved also some difficulties and are based on the regional distribution of premiums paid by consumers to their insurance companies. To calculate the insurance fund reserves the premiums of the previous 10 years were totaled for each year.<sup>11</sup> Regional estimates of both pension funds and life insurance reserves are provided for the first time.

For the regional estimate of the technical reserves on the liability side of the household balance sheet we assumed that this financial liability is entirely made of pension fund reserves paid by consumer and producer households to their workers. Then we calculated the regional quotas of the consumer and producer workers and multiplied each of them by their weights in the total workforce.

The new estimates of household financial wealth by region are more accurate than the earlier ones (Cannari, D'Alessio and Paiella, 2006) in two respects. First, the Financial Accounts now provide the estimates of some instruments that were previously unavailable. In particular, the new regional estimates include trade credits, shareholders' loans to co-operative societies<sup>12</sup> and shares in quasi-corporations. Accordingly, the value of Italian household financial wealth turns out to be higher. In terms of per capita financial assets in 2005 the new estimates show a national value of € 59,600 against € 54,600 in the old estimates. At the geographical level, the difference with previous estimates is higher than that concerning the national average in the central and southern regions (13.9 and 9.8 per cent respectively in 2005 against 9.1 for Italy), and lower in the

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<sup>10</sup> The household sector includes the consumer households and the producer households.

<sup>11</sup> It was not possible to calculate the cumulative distribution function of the premiums because of the difficulty in identifying a suitable interest rate.

<sup>12</sup> In the period 1998-2005 shareholders' loans to cooperative societies were a negligible proportion of total financial wealth in all the geographical areas.

North (7.7 per cent). Second, regional estimates of pension funds and life insurance reserves are provided, while they were both included in the residual item “other assets” in the previous estimates (see Appendix B for methodological details).

Setting aside the new components of the Financial Accounts, if we compare the new estimates of household financial wealth by region with those in Cannari, D’Alessio and Paiella (2006) we find that in general the new figures are lower, although the differences are tiny and do not change the distribution of household financial wealth by region. The difference in per capita household financial wealth is below 2 per cent between 1998 and 2002; it widens afterwards, reaching -5.4 per cent in 2004. From a geographical perspective, the gap is more marked in the North (-6.4 per cent in 2004), and less pronounced in the other regions (around -3.5 per cent).

Looking at the regional disparities, the new estimates provide the same picture as Cannari, D’Alessio and Paiella (2006) for 2004, except for marginal differences (Table 1). The North has a per capita financial wealth which is far above the national average (€ 72,100 against € 51,500 for Italy) and accounts for almost three times the value in the southern regions and almost 1.5 times that in the Centre (€ 25,700 and € 51,000). Ordering the regions by per capita financial assets Emilia Romagna, Lombardy and Piedmont are confirmed as the richest regions, with a level of wealth of € 82,400, € 80,500 and € 70,100 respectively, while Sicily, Calabria and Sardinia turn out to be the poorest ones with only € 23,600, € 22,300 and € 22,000 per inhabitant.

Turning to the components of financial assets, in line with Cannari, D’Alessio and Paiella (2006), we found that between 1998 and 2004 the relevance of “currency and deposits” over financial wealth decreases, while “shares and equity” and “bonds and investment funds” become more important. The new estimates confirm that the percentage of financial assets represented by “currency and deposits” is much higher in the South and Islands than in the rest of the country (39.3 per cent in 2004, against 19.2 per cent in the North and 27.7 per cent in the Centre). The most marked differences between the two sets of estimates concern the financial instrument “shares and equity”. According to the new estimates, in 2004 the per capita value of shares and equity was 13.7 per cent lower compared to Cannari, D’Alessio and Paiella (2006). The difference widens in the northern regions (-15.9 per cent), where equity was a higher proportion of financial assets. Finally, in line with the findings of Cannari, D’Alessio and Paiella (2006), the new estimates show that the ratio of financial liabilities to financial assets is higher in the South and Islands than in the rest of the country (20.8 per cent against the national average of 16.7), although the stock of liabilities is much higher in the North.

### **3. The composition of wealth and territorial disparities**

#### *3.1 Household net wealth by region*

Household net wealth is defined as the total market value of real and financial assets, net of debts. At the end of 2005 the net wealth of Italian households amounted to € 133,500 per capita; its level in the northern regions (€ 167,900) was more than twice that in the southern ones (€ 83,000; Table 2); while in the Centre net wealth amounted to € 145,400. The share of national wealth belonging to northern regions’ households was equal to 57.0 per cent, against 21.0 and 22.0 per cent in the central and southern regions respectively (Tables 3-6 and Figure 1). In any of the northern regions per capita net wealth was above the national average, while in any of the southern ones it was below. The regions with the highest value of per capita net wealth were Liguria, Emilia-Romagna and Valle d’Aosta, the ones with the lowest value were Puglia, Sicily and Calabria.

The territorial gap is confirmed by the ratio of net wealth to disposable income. In 2003 household net wealth was 8.1 times the disposable income in the North against a ratio of 7.4 and 6.2 in the Centre and in the South and Islands respectively. From 1998 to 2003 the ratio increased by more than 8 per cent in the Centre and North, against 5.3 per cent in the South and Islands.

In 2005 real assets were a higher proportion of net wealth than financial ones (63.1 per cent); the proportion was higher in the South and Islands (70.8 per cent) than in the North and the Centre (58.4 and 67.7 per cent, respectively; see Figures 2-4). More than half of the net wealth in the Centre and the South is represented by dwellings (55.1 and 52.2 per cent, respectively), while the share is lower in the North (44.5). The wide gap between the two areas is mainly due to the lower propensity of households in the South and Islands to invest in financial assets, especially the risky ones, given the lower level of total wealth and higher uncertainty over future income (Cannari, D'Alessio and Paiella, 2006). The lower unit market value of houses in the southern regions may also have facilitated the acquisition of dwellings in that area.

The evolution over time of the two components of households' wealth, real and financial, depends mainly on the market values of houses and equities. The gap between them narrowed in the period 1998-2000 because of the growth of the market value of equities; it has widened since 2000, after the abrupt fall of share prices<sup>13</sup> and the beginning of a new phase of steep growth in housing prices.

During the period 1998-2005 net wealth increased by 5.8 per cent per year. The growth was slightly higher in the Centre (6.2 per cent) than in the other areas (5.8 and 5.5 per cent respectively in the North and in the South and Islands). As a result, the shares of the geographical areas changed only marginally. Nor did regional ranking change very much during the period 1998-2005: both in 1998 and in 2005 Liguria and Emilia Romagna showed the highest levels of per capita net wealth, while Sicily and Calabria were characterized by the lowest values.

According to the new estimates, per capita net wealth in 2004 is lower than in the estimates of Cannari, D'Alessio and Paiella (2006) by 10.5 per cent. This is due to the new dwelling price series used to estimate real wealth, which on average are below the old prices. In the North and Centre the new estimates of per capita net wealth are lower than the earlier ones by 11.5 and 13.9 per cent respectively; in the South and Islands the difference is smaller (3.8 per cent), also due to the larger contribution of some new components of wealth, such as producer households' capital.

### 3.2 *Real wealth by region*

In 2005 per capita real wealth in Italy was equal to € 84,200; in the North and Centre it was above the national mean (€ 98,000 and € 98,500 respectively) while in the southern regions it was far below (€ 58,800; Table 7). At regional level, the three per capita wealthiest regions are Valle d'Aosta, Trentino-Alto Adige and Liguria; the poorest ones are Puglia, Sicily and Calabria. The regional ranking is almost completely explained by the market value of houses: Pearson's coefficient of correlation between the two rankings (total real wealth and value of dwellings) is equal to 0.96.

As mentioned above, the components of real wealth are dwellings, the stock of physical capital plus inventory and goodwill of the producer households, lands, and

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<sup>13</sup> The growth of the value of shares after 2003 did not change the composition of net wealth significantly.

valuables. In any geographical area the large majority of real wealth is represented by dwellings (Figures 5-7). In the northern regions the market value of dwellings represents 78.2 per cent of the total value of real wealth; this share is larger in the Centre (83.4 per cent) and smaller in the South and Islands (75.6). These geographical differences are mostly explained by differences in the level of house prices and by the relevance in each region of metropolitan areas, where house prices are markedly higher. The second main component of real wealth is the stock of physical capital of producer households, including inventories and goodwill, representing 13.6, 11.2 and 16.3 per cent of real wealth of households in the northern, central and southern regions, respectively. The larger share of small business capital in the South and Islands is due to the larger capital stock endowment and the greater presence of small businesses in this area. The value of land corresponds to just 5.4 per cent of total real wealth in the North, to 5.5 per cent in the South and the Islands, and to 2.7 per cent in the Centre, while valuables are negligible.

From 1998 to 2005 per capita real wealth in the Centre increased by 6.7 per cent per year (6.2 per cent in Italy); in the North and in the South and Islands the increase was lower (6.1 and 5.7 per cent, respectively). This is mostly due to the larger increase in the market value of dwellings in the central regions driven by the larger increase in prices and, in part, to the greater stock of houses than in the other regions. Regional ranking has been substantially stable over time: Tuscany climbed two places; Umbria slipped back two, while the other regions remained approximately in the same position as 1998.

### *3.3 The composition of financial wealth by region*

In 2005 per capita financial wealth in Italy was equal to € 59,600. The value in the North was far above the national average (€ 82,200), it was slightly below in the Centre and far below in the South and Islands (€ 58,900 and € 30,900 respectively; Table 8). The new estimates thus confirm the disparities between the southern regions and the rest of the country. At regional level, Emilia Romagna, Lombardy and Piedmont are the richest regions, with a level of per capita financial assets of € 95,000, € 91,300 and € 79,100 respectively, while Sicily, Sardinia and Calabria turn out to be the poorest ones with € 28,000, € 27,700 and € 27,100 per capita.

Looking at the components of Italian households' financial wealth, the largest share of these assets is represented by equity, shares and investment units, followed by currency and deposits and finally by bonds (37, 24 and 18 per cent respectively in 2005). Insurance products account for about 10 per cent of financial assets. Households resident in the North and Centre of the country allocate the majority of their financial wealth to risky assets (equity, shares and investment units represent 42 and 33 per cent of financial assets respectively), while those in the South and Islands show a preference for liquidity<sup>14</sup> (it accounts for 40 per cent of financial assets against 27 per cent of equity, shares and investment units). The low propensity of southern households to invest in risky assets reflects many factors: a lower than average level of total wealth, the perception of high uncertainty about future income flows, lower levels of education, social capital and reciprocal trust.<sup>15</sup> The higher share of equities in the portfolio of northern households is mainly due to the concentration of production activities in the central and northern regions.<sup>16</sup>

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<sup>14</sup> Liquidity includes currency, deposits and postal savings.

<sup>15</sup> See Guiso and Jappelli (2002) and Guiso, Sapienza and Zingales (2004).

<sup>16</sup> Since unlisted securities are not exchanged frequently, usually they are held by households resident in the same geographical area of firms.

The composition of financial wealth underwent a remarkable change during the period 1998-2005. In the first place, Italian households decreased the share of financial wealth invested in bank deposits. This took place during the period 1998-2000 and was determined by the long term component of deposit accounts (certificates of deposit and savings accounts); current accounts increased in all geographical areas. In the same period the ratio of postal savings to financial wealth increased in all geographical areas. Although the ratio of postal current accounts to households' financial assets is still very low (0.6 per cent in 2005), this instrument increased in all geographical areas, especially in the South and Islands (1.2 per cent in 2005). The proportion of financial wealth invested in the other components of postal savings (postal savings book and postal savings certificates) increased everywhere and is particularly high in southern regions. Greater recourse to postal savings in the South and Islands is also explained by the lower number of bank branches in that area.<sup>17</sup> According to the Survey of Household Income and Wealth (SHIW) data, since the beginning of the nineties postal customers have shown demographic characteristics more similar to those of bank customers.

Between 1998 and 2005 the diffusion of government bonds declined in all geographical areas, while investment in private bonds increased, especially in the central and northern regions. During the same period investment in foreign assets (bonds and equities) increased everywhere, particularly in the North-West (7.2 per cent of total financial wealth at the end of 2005).

The share of financial wealth invested in equities<sup>18</sup> is influenced by the evolution of the Stock Exchange market: after the peak of 2000, it fell until 2003 and then rose again, reaching levels higher than the initial ones, but lower than the level reached in 2000. This evolution is mainly determined by the northern regions, where investment in equities is more widespread; in these regions in 2005 the share of total financial wealth invested in equities was slightly lower than in 2000. During the period 1998-2005 the allocation of Italian households' wealth to investment fund units heavily declined in all the geographical areas, especially in the northern regions (from 18.5 per cent to 10.9 of total financial wealth). The performance of some investment funds, especially the monetary and bond ones, has partly determined this trend.

In 2005 the shares in quasi-corporations held by Italian households amounted to 5.5 per cent of total financial wealth (5.8 per cent in 1998). Their diffusion is higher in the South and Islands (8.5 per cent) than in the other areas (6.0 and 4.5 per cent in the North and Centre respectively); the geographical relevance of this item did not change significantly during the period 1998-2005.

During the period 1998-2005 the number of authorized pension schemes increased from 87 to 132; from 2001 to 2005 the number of subscribers increased by 30 per cent for occupational funds and by 42 per cent for open funds.<sup>19</sup> In spite of the strong dynamic of the sector, in 2005 the share of households' financial wealth invested in pension funds was only slightly higher than in 1998 (5.5 and 4.9 per cent respectively); the growth of this financial instrument was stronger in the central regions and its ratio to total financial wealth is larger in the same area (7.0 per cent in 2005).

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<sup>17</sup> According to the SHIW data in 2004 10 per cent of the "Post only" customers were resident in towns where no bank branches were present.

<sup>18</sup> It is worth noting that the market value of equities is partially estimated because a large part of them are non-marketable securities.

<sup>19</sup> See Cesari, Grande and Panetta (2007).



The share of financial wealth allocated to the insurance funds rose sharply from 4.3 per cent in 1998 to 10.1 per cent in 2005. The growth was uniformly distributed among all the geographical areas. According to the SHIW data, higher income households, whose heads are more educated and have a higher share of equities and investment funds in their portfolio, have a higher propensity to invest in insurance funds.

The trade credit of Italian households was 2.5 per cent of total financial wealth in 2005. Its share was higher in the South and Islands (3.6 per cent) than in the other areas (2.8 and 2.1 in the North and Centre). The geographical quotas did not change significantly during the period 1998-2005.

At the end of 2005 the amount of per capita financial debts was € 10,261. In the South and Islands it was about half that of the North and Centre; the gap between the two areas increased during the period 1998-2005. However it should be taken into account that only a small part of the population is financially indebted: according to the SHIW data, in 2004 the share of indebted households was 23.9 and 18.3 per cent respectively in the Centre and North and in the South and Islands.

In 2005 mortgage loans represented 38.1 per cent of total financial liabilities (21.3 in 1998). The share was higher in the central and northern regions (39.2 and 41.3 per cent respectively) compared to the regions in the South and Islands (29.3 per cent). The increased use of this form of indebtedness is mainly due to the falling interest rates, the rising house prices and the lending policies of financial intermediaries.

During the period 1998-2005 the share of consumer credit rose from 7.5 to 11.4 per cent of the total amount of households' financial liabilities. The importance of this form of debt increased in all geographical areas, especially in the South and Islands (from 9.4 per cent in 1998 to 17.9 per cent in 2005). The use of this instrument shows high geographical variability; this heterogeneity is partly due to the distribution of large-scale retailing over the different areas.

As for trade debt and technical reserves, their shares on total financial liabilities decreased from 1998 to 2005. In both cases the reduction took place in all geographical areas.

In 2005 other loans<sup>20</sup> accounted for 18.8 per cent of total financial liabilities (32.8 per cent in 1998). Their share decreased in all geographical areas, especially in the South and Islands.

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<sup>20</sup> Most of them are loans to producer households.

**APPENDIX A**  
**FIGURES AND TABLES**

Table 1

**Per capita real and financial wealth: previous and new estimates in 2004**<sup>(1)</sup>  
*(thousands of euros)*

Region/Area	Real wealth		Financial wealth	
	Cannari, D'Alessio and Paiella (2006)	New estimates	Cannari, D'Alessio and Paiella (2006)	New estimates
Piedmont .....	64.0	62.2	74.4	70.1
Valle d'Aosta .....	68.4	96.6	57.7	55.6
Lombardy .....	125.6	77.3	88.3	80.5
Trentino-Alto Adige .....	103.1	99.0	58.0	57.8
Veneto .....	107.6	75.5	60.4	59.1
Friuli-Venezia Giulia .....	74.1	66.7	54.6	54.2
Liguria .....	96.1	98.1	65.0	64.0
Emilia-Romagna .....	101.0	84.6	89.5	82.4
Tuscany .....	95.1	77.9	58.7	57.3
Umbria .....	65.4	56.9	42.3	41.3
Marche .....	79.8	63.8	48.0	47.0
Lazio .....	130.8	86.8	51.7	49.4
Abruzzo .....	54.9	52.0	31.1	31.1
Molise .....	54.3	49.3	33.7	31.3
Campania .....	70.5	49.5	28.5	27.3
Puglia .....	38.1	41.3	29.4	26.9
Basilicata .....	49.3	41.7	27.2	25.9
Calabria .....	39.6	36.8	22.8	22.3
Sicily .....	47.8	37.8	23.6	23.6
Sardinia .....	55.9	48.2	22.1	22.0
North .....	103.2	77.3	77.1	72.1
Centre .....	107.5	78.6	52.7	51.0
South and Islands .....	52.7	43.6	26.6	25.7
Italy .....	86.1	65.6	54.4	51.5

(1) Using the same components of the real and financial wealth of Cannari, D'Alessio and Paiella (2006); durable goods are excluded.

Table 2

**Per capita wealth in 2005 and net wealth / disposable income ratio in 2003**  
*(thousands of euros, percentage changes and percentages)*

Region/Area	Real assets	Financial assets	Financial liabilities	Net wealth		Net wealth/ disposable income ratio (2003)	Net wealth/ disposable income ratio of consumer households (2003)
					% changes 2005/1998		
Piedmont	81.0	79.1	11.1	149.0	33.3	7.5	7.1
Valle d'Aosta	129.7	65.3	10.2	184.8	47.8	6.6	5.7
Lombardy .....	95.9	91.3	13.3	173.9	40.6	8.2	7.9
Trentino-Alto Adige.....	129.0	68.1	13.6	183.5	48.1	8.8	8.0
Veneto.....	96.4	66.6	11.6	151.3	45.9	8.1	7.7
Friuli-Venezia Giulia	84.9	62.5	11.0	136.4	38.6	7.0	6.6
Liguria .....	126.0	74.8	10.2	190.5	51.1	8.6	8.3
Emilia-Romagna.....	107.1	95.0	13.1	188.9	42.8	8.4	7.9
Tuscany.....	103.3	67.7	12.0	159.0	55.7	7.8	7.4
Umbria.....	72.7	47.9	10.2	110.4	25.8	6.3	5.9
Marche.....	83.7	55.2	11.1	127.9	39.2	6.8	6.2
Lazio.....	103.6	55.8	12.5	146.9	44.7	7.5	7.2
Abruzzo .....	70.7	37.6	8.3	100.0	39.8	6.5	5.8
Molise.....	65.5	36.0	6.8	94.7	46.2	6.2	5.5
Campania.....	63.8	32.7	6.2	90.3	51.6	6.9	6.4
Puglia.....	56.5	32.5	6.6	82.3	50.8	6.1	5.5
Basilicata .....	63.1	32.0	6.0	89.1	47.6	6.3	5.3
Calabria.....	51.1	27.1	5.7	72.5	47.0	5.6	5.0
Sicily.....	51.9	28.0	6.9	73.0	35.0	5.7	5.2
Sardinia.....	65.4	27.7	8.3	84.8	37.6	5.9	5.3
North .....	98.0	82.2	12.3	167.9	41.7	8.1	7.8
Centre .....	98.5	58.9	12.0	145.5	46.3	7.4	7.1
South and Islands .....	58.8	30.9	6.7	83.1	45.0	6.2	5.7
Italy .....	84.2	59.6	10.3	133.5	44.2	7.5	7.1

Table 3

**Household wealth – North**  
(*millions of euros*)

	1998	1999	2000	2001	2002	2003	2004	2005
Currency .....	26,494	29,689	31,301	25,815	24,972	29,954	34,823	39,741
Bank deposits.....	252,483	235,867	237,383	253,147	261,585	265,369	271,623	283,375
Postal savings ....	48,071	53,973	57,397	65,994	70,734	77,962	85,607	95,498
Securities issued by residents).....	131,562	131,219	159,698	171,508	197,907	230,674	250,796	242,907
Bonds issued by the Italian government .....	167,056	109,036	122,713	133,465	146,162	128,765	142,354	112,974
Securities (rest of the world) .....	46,523	57,492	58,260	67,944	65,131	66,306	63,931	87,380
Shares in quasi- corporations .....	72,335	75,542	76,330	75,069	81,850	86,897	97,148	98,883
Shares (issued by residents).....	272,379	415,957	444,324	371,471	388,364	395,977	433,316	500,844
Shares (rest of the world).....	47,406	69,799	87,947	64,561	53,437	59,251	60,103	69,301
Investment fund units.....	283,536	373,155	356,599	285,999	235,734	246,432	231,609	238,304
Pension funds.....	70,138	77,765	83,654	92,013	98,026	101,818	104,873	111,994
Life insurance reserves .....	61,600	81,077	99,689	117,633	139,472	167,081	192,602	218,167
Trade credits .....	31,567	30,030	37,404	36,665	38,024	39,899	42,451	45,542
<b>Total financial assets .....</b>	<b>1,536,017</b>	<b>1,768,015</b>	<b>1,882,488</b>	<b>1,789,202</b>	<b>1,832,348</b>	<b>1,929,359</b>	<b>2,046,512</b>	<b>2,184,134</b>
Consumer credit.	11,485	13,608	15,243	16,620	18,630	20,707	23,724	28,215
Mortgage loans ..	41,690	53,864	70,927	75,199	84,729	98,462	116,456	135,254
Other loans.....	50,878	55,687	52,394	53,684	59,499	59,300	61,581	62,510
Trade debts .....	29,417	27,727	35,270	34,407	35,299	36,978	39,359	42,410
<b>Total financial liabilities.....</b>	<b>170,474</b>	<b>191,247</b>	<b>217,359</b>	<b>226,121</b>	<b>247,223</b>	<b>268,824</b>	<b>298,282</b>	<b>327,228</b>
<b>Real assets.....</b>	<b>1,633,379</b>	<b>1,664,211</b>	<b>1,768,965</b>	<b>1,905,709</b>	<b>2,094,135</b>	<b>2,297,317</b>	<b>2,438,723</b>	<b>2,603,944</b>
of which: dwellings.....	1,270,069	1,282,141	1,358,939	1,466,393	1,615,571	1,787,261	1,894,931	2,036,508
<b>Net wealth .....</b>	<b>2,998,922</b>	<b>3,240,979</b>	<b>3,434,094</b>	<b>3,468,790</b>	<b>3,679,259</b>	<b>3,957,852</b>	<b>4,186,953</b>	<b>4,460,849</b>

Table 4

**Household wealth – Centre**  
(millions of euros)

	1998	1999	2000	2001	2002	2003	2004	2005
Currency .....	10,141	11,364	11,891	9,961	9,819	11,743	13,873	15,786
Bank deposits.....	95,510	93,705	94,845	100,129	104,364	107,876	110,244	115,346
Postal savings ....	26,209	29,371	31,232	36,003	38,586	44,102	49,264	47,466
Securities issued by residents).....	34,155	31,795	38,935	44,946	54,190	59,407	67,501	65,990
Bonds issued by the Italian government .....	56,006	36,741	39,546	45,211	52,521	38,351	42,479	33,247
Securities (rest of the world) .....	8,695	10,720	11,219	15,587	17,719	16,327	16,453	21,255
Shares in quasi- corporations .....	28,967	30,251	30,566	30,061	32,777	34,798	38,903	39,598
Shares (issued by residents).....	88,194	116,007	133,620	125,127	124,311	93,635	99,730	116,241
Shares (rest of the world).....	11,286	14,252	11,536	20,276	8,834	9,310	10,197	16,335
Investment fund units.....	44,563	56,661	51,950	56,261	51,198	50,548	48,391	48,959
Pension funds.....	25,694	27,024	29,187	30,244	32,744	35,768	42,314	46,430
Life insurance reserves .....	23,690	30,273	35,616	41,310	46,216	53,973	61,524	69,613
Trade credits .....	12,237	11,610	14,680	14,437	15,072	15,727	17,167	18,366
<b>Total financial assets .....</b>	<b>472,689</b>	<b>507,876</b>	<b>543,600</b>	<b>577,029</b>	<b>596,392</b>	<b>579,910</b>	<b>626,869</b>	<b>664,661</b>
Consumer credit.	5,041	6,006	7,048	8,803	10,250	11,684	13,326	15,392
Mortgage loans ..	16,849	21,873	27,166	30,993	33,895	37,654	44,710	52,854
Other loans.....	24,288	23,778	21,756	21,853	21,596	21,522	23,065	23,446
Trade debts .....	11,403	10,720	13,843	13,548	13,992	14,576	15,917	17,103
<b>Total financial liabilities.....</b>	<b>73,610</b>	<b>79,788</b>	<b>88,627</b>	<b>94,603</b>	<b>100,907</b>	<b>108,372</b>	<b>122,389</b>	<b>134,993</b>
<b>Real assets.....</b>	<b>677,296</b>	<b>683,425</b>	<b>723,225</b>	<b>775,842</b>	<b>869,549</b>	<b>949,973</b>	<b>1,025,199</b>	<b>1,111,124</b>
of which: dwellings.....	542,982	544,541	577,128	621,691	704,096	774,578	848,001	927,052
<b>Net wealth .....</b>	<b>1,076,374</b>	<b>1,111,513</b>	<b>1,178,198</b>	<b>1,258,268</b>	<b>1,365,034</b>	<b>1,421,512</b>	<b>1,529,679</b>	<b>1,640,793</b>

Table 5

**Household wealth – South and Islands**  
(*millions of euros*)

	1998	1999	2000	2001	2002	2003	2004	2005
Currency .....	11,658	13,064	13,773	11,459	11,153	13,332	15,373	17,526
Bank deposits.....	111,125	109,049	110,791	115,851	114,845	115,184	115,168	119,687
Postal savings ....	63,575	71,906	76,486	87,084	93,277	100,260	108,022	115,965
Securities issued by residents).....	30,884	30,950	39,707	43,429	47,883	49,899	53,533	48,900
Bonds issued by the Italian government .....	35,211	23,905	28,273	33,110	33,910	28,357	31,820	26,116
Securities (rest of the world) .....	3,586	4,504	6,319	7,931	8,102	7,801	7,021	9,910
Shares in quasi- corporations .....	39,872	41,640	42,074	41,379	45,117	47,899	53,549	54,506
Shares (issued by residents).....	34,733	71,847	70,120	79,069	57,877	55,013	59,633	71,549
Shares (rest of the world).....	1,290	11,010	7,881	8,140	4,326	4,059	5,687	4,638
Investment fund units.....	40,994	48,850	44,905	45,750	39,603	41,839	40,607	43,606
Pension funds.....	24,719	24,868	25,972	25,862	26,297	29,236	30,485	32,590
Life insurance reserves .....	19,846	25,063	30,129	35,585	40,758	49,038	56,669	64,751
Trade credits .....	17,443	16,037	20,644	20,297	20,841	20,677	21,531	22,827
<b>Total financial assets .....</b>	<b>441,434</b>	<b>499,758</b>	<b>524,846</b>	<b>561,293</b>	<b>550,962</b>	<b>569,909</b>	<b>606,886</b>	<b>641,624</b>
Consumer credit.	7,971	9,120	10,622	11,976	14,577	17,703	20,383	24,946
Mortgage loans ..	11,408	13,932	18,217	20,089	22,684	27,492	34,115	40,718
Other loans.....	32,586	33,422	29,017	28,899	27,434	26,393	27,315	26,987
Trade debts .....	16,254	14,807	19,466	19,047	19,347	19,163	19,963	21,257
<b>Total financial liabilities.....</b>	<b>84,664</b>	<b>91,431</b>	<b>99,105</b>	<b>103,338</b>	<b>109,398</b>	<b>118,490</b>	<b>126,325</b>	<b>139,122</b>
<b>Real assets.....</b>	<b>824,406</b>	<b>847,373</b>	<b>893,409</b>	<b>924,555</b>	<b>986,196</b>	<b>1,049,211</b>	<b>1,123,406</b>	<b>1,220,576</b>
of which: dwellings.....	594,035	609,449	644,333	664,800	713,665	766,231	835,246	922,962
<b>Net wealth .....</b>	<b>1,181,176</b>	<b>1,255,700</b>	<b>1,319,150</b>	<b>1,382,511</b>	<b>1,427,760</b>	<b>1,500,630</b>	<b>1,603,967</b>	<b>1,723,077</b>

Table 6

**Household wealth – Italy**  
(millions of euros)

	1998	1999	2000	2001	2002	2003	2004	2005
Currency .....	48,293	54,117	57,054	47,235	45,944	55,028	64,069	73,054
Bank deposits.....	459,118	438,621	443,019	469,127	480,794	488,428	497,036	518,409
Postal savings ....	137,855	155,251	256,426	189,080	202,597	222,324	242,892	258,929
Securities issued by residents).....	196,601	193,964	238,341	259,883	299,980	339,979	371,830	357,797
Bonds issued by the Italian government .....	258,272	169,682	190,532	211,786	232,593	195,473	216,653	172,337
Securities (rest of the world) .....	58,805	72,715	75,798	91,462	90,592	90,434	87,405	118,544
Shares in quasi- corporations .....	141,174	147,432	148,971	146,509	159,744	169,594	189,600	192,986
Shares (issued by residents).....	455,288	603,811	648,064	575,667	570,552	544,626	592,680	688,634
Shares (rest of the world).....	59,982	95,061	107,365	92,977	66,596	72,620	75,987	90,274
Investment fund units.....	369,093	478,665	453,454	388,011	326,535	338,819	320,607	330,869
Pension funds.....	120,551	129,657	138,813	148,119	157,067	166,822	177,672	191,014
Life insurance reserves .....	105,136	136,414	165,434	194,527	226,445	270,093	310,795	352,531
Trade credits .....	61,247	57,677	72,729	71,399	73,936	76,304	81,148	86,734
<b>Total financial assets .....</b>	<b>2,450,140</b>	<b>2,775,648</b>	<b>2,950,934</b>	<b>2,927,525</b>	<b>2,979,701</b>	<b>3,079,179</b>	<b>3,280,266</b>	<b>3,490,419</b>
Consumer credit.	24,496	28,734	32,913	36,679	43,458	50,093	57,434	68,553
Mortgage loans ..	69,947	89,669	116,310	126,281	141,308	163,608	195,281	228,826
Other loans.....	107,752	112,888	103,167	104,436	108,530	107,215	111,961	112,943
Trade debts .....	57,074	53,253	68,579	67,002	68,638	70,717	75,238	80,770
<b>Total financial liabilities.....</b>	<b>328,748</b>	<b>362,465</b>	<b>405,091</b>	<b>424,061</b>	<b>457,528</b>	<b>495,686</b>	<b>546,995</b>	<b>601,344</b>
<b>Real assets.....</b>	<b>3,135,081</b>	<b>3,195,010</b>	<b>3,385,598</b>	<b>3,606,106</b>	<b>3,949,880</b>	<b>4,296,501</b>	<b>4,587,327</b>	<b>4,935,644</b>
of which: dwellings.....	2,407,086	2,436,131	2,580,400	2,752,885	3,033,332	3,328,070	3,578,178	3,886,522
<b>Net wealth .....</b>	<b>5,256,473</b>	<b>5,608,193</b>	<b>5,931,442</b>	<b>6,109,570</b>	<b>6,472,053</b>	<b>6,879,993</b>	<b>7,320,599</b>	<b>7,824,719</b>

Table 7

**Per capita real wealth**  
(thousands of euros, percentage values)

Region/Area	1998	2005	Growth rate 1998-2005	Ranking 1998	Ranking 2005
Piedmont.....	54.2	81.0	49.6	12	11
Valle d'Aosta.....	81.6	129.7	58.9	2	1
Lombardy.....	62.2	95.9	54.1	7	8
Trentino-Alto Adige.....	84.5	129.0	52.6	1	2
Veneto.....	64.8	96.4	48.6	6	7
Friuli-Venezia Giulia.....	59.9	84.9	41.7	9	9
Liguria.....	72.6	126.0	73.5	4	3
Emilia-Romagna.....	73.6	107.1	45.4	3	4
Tuscany.....	61.7	103.3	67.5	8	6
Umbria.....	58.7	72.7	23.8	10	12
Marche.....	56.9	83.7	47.1	11	10
Lazio.....	65.4	103.6	58.6	5	5
Abruzzo.....	49.6	70.7	42.6	13	13
Molise.....	47.1	65.5	39.3	15	14
Campania.....	40.3	63.8	58.1	17	16
Puglia.....	37.1	56.5	52.3	19	18
Basilicata.....	43.0	63.1	46.7	16	17
Calabria.....	34.9	51.1	46.5	20	20
Sicily.....	38.3	51.9	35.5	18	19
Sardinia.....	47.1	65.4	38.8	14	15
North.....	64.6	98.0	51.8	-	-
Centre.....	62.5	98.5	57.4	-	-
South and Islands.....	39.9	58.8	47.2	-	-
Italy.....	55.2	84.2	52.5	-	-



Table 8

**Per capita financial wealth**  
(thousands of euros, percentage values)

Region/Area	1998	2005	Growth rate 1998-2005	Ranking 1998	Ranking 2005
Piedmont.....	63.9	79.1	23.8	3	3
Valle d'Aosta.....	49.7	65.3	31.5	5	8
Lombardy.....	68.5	91.3	33.2	1	2
Trentino-Alto Adige.....	47.8	68.1	42.4	6	5
Veneto.....	45.2	66.6	47.4	8	7
Friuli-Venezia Giulia.....	44.8	62.5	39.5	9	9
Liguria.....	59.6	74.8	25.4	4	4
Emilia-Romagna.....	65.7	95.0	44.6	2	1
Tuscany.....	47.3	67.7	43.0	7	6
Umbria.....	35.2	47.9	36.1	12	12
Marche.....	40.9	55.2	34.9	11	11
Lazio.....	43.3	55.8	28.9	10	10
Abruzzo.....	26.8	37.6	40.3	13	13
Molise.....	22.0	36.0	63.4	15	14
Campania.....	22.6	32.7	44.6	14	15
Puglia.....	21.6	32.5	50.5	16	16
Basilicata.....	21.4	32.0	49.9	17	17
Calabria.....	18.2	27.1	49.2	20	20
Sicily.....	20.3	28.0	38.1	18	18
Sardinia.....	19.9	27.7	39.5	19	19
North.....	60.7	82.2	35.4	-	-
Centre.....	43.7	58.9	34.9	-	-
South and Islands.....	21.4	30.9	44.5	-	-
Italy.....	43.2	59.6	38.0	-	-

Figure 1

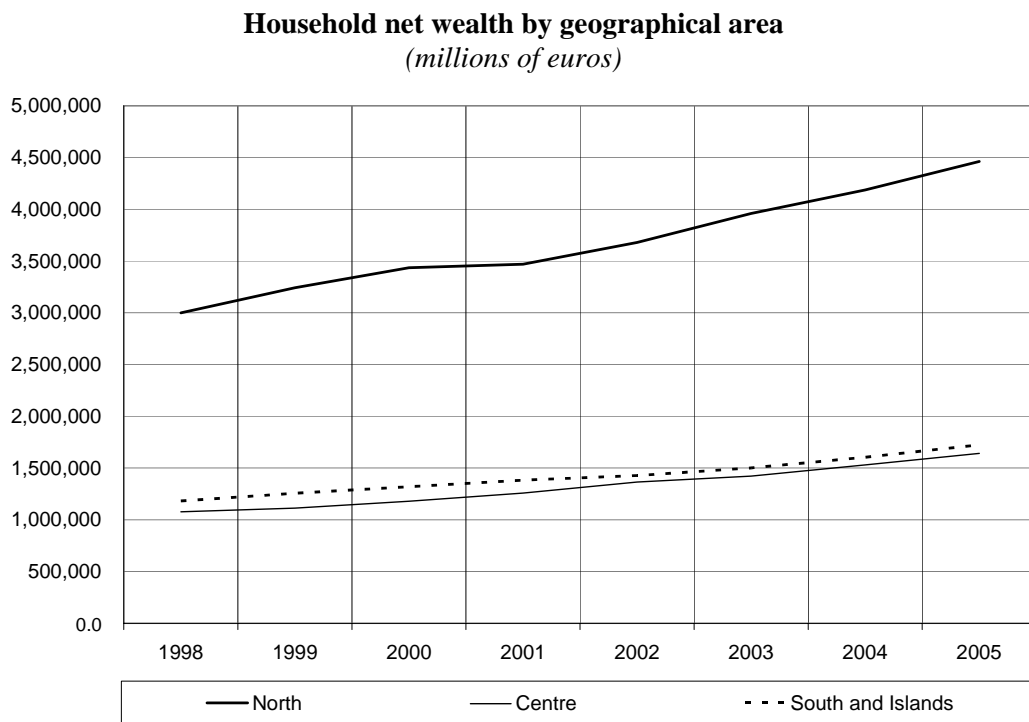


Figure 2

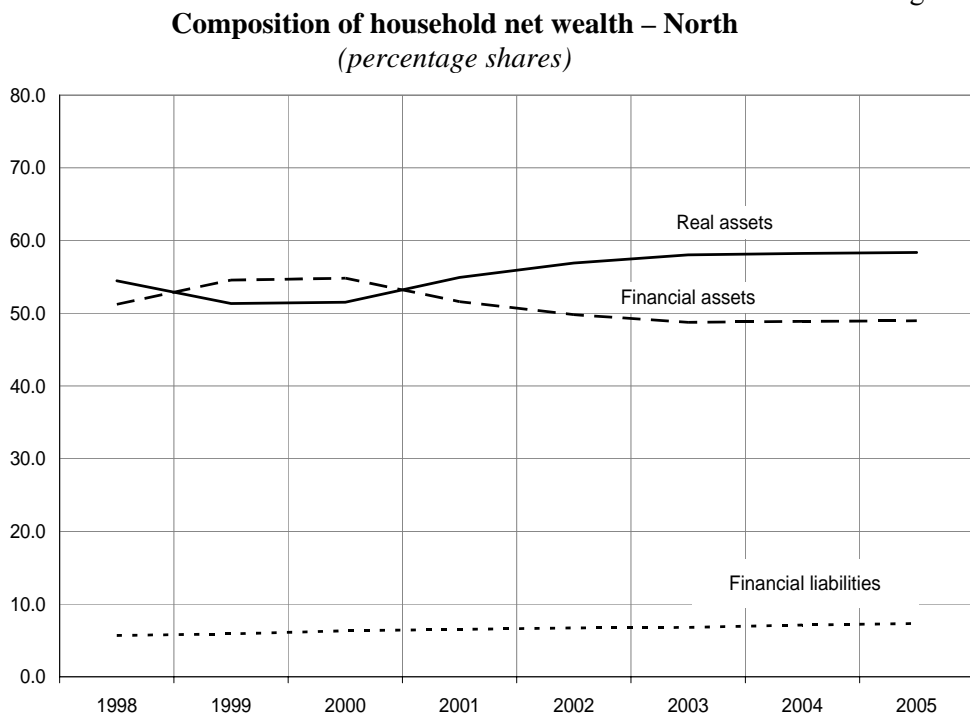


Figure 3

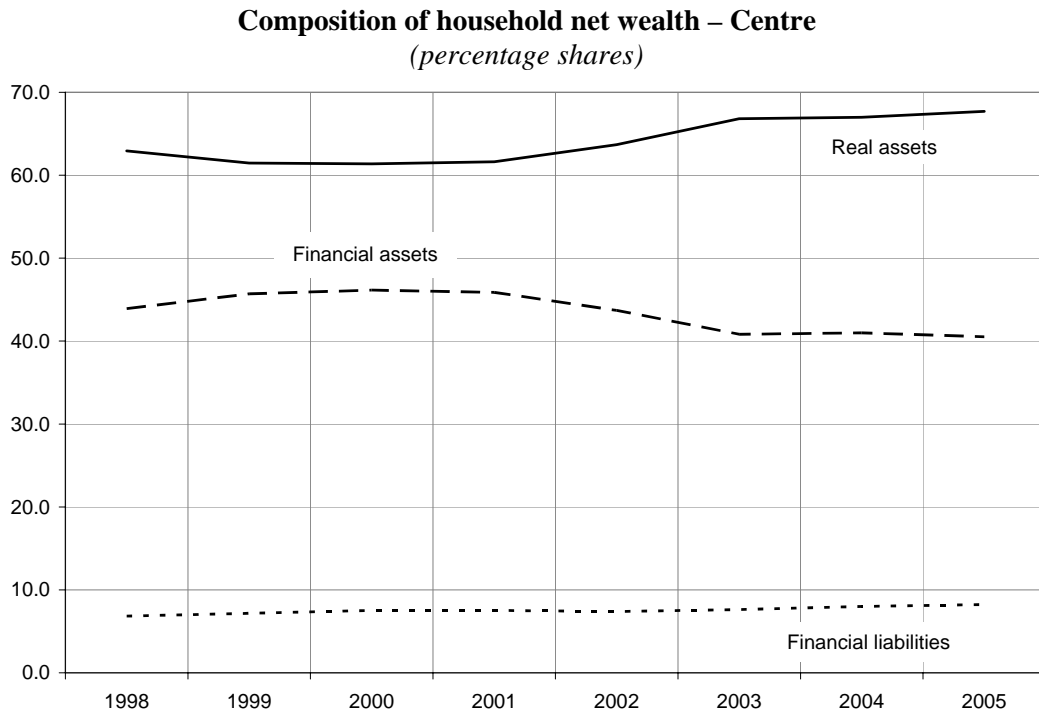


Figure 4

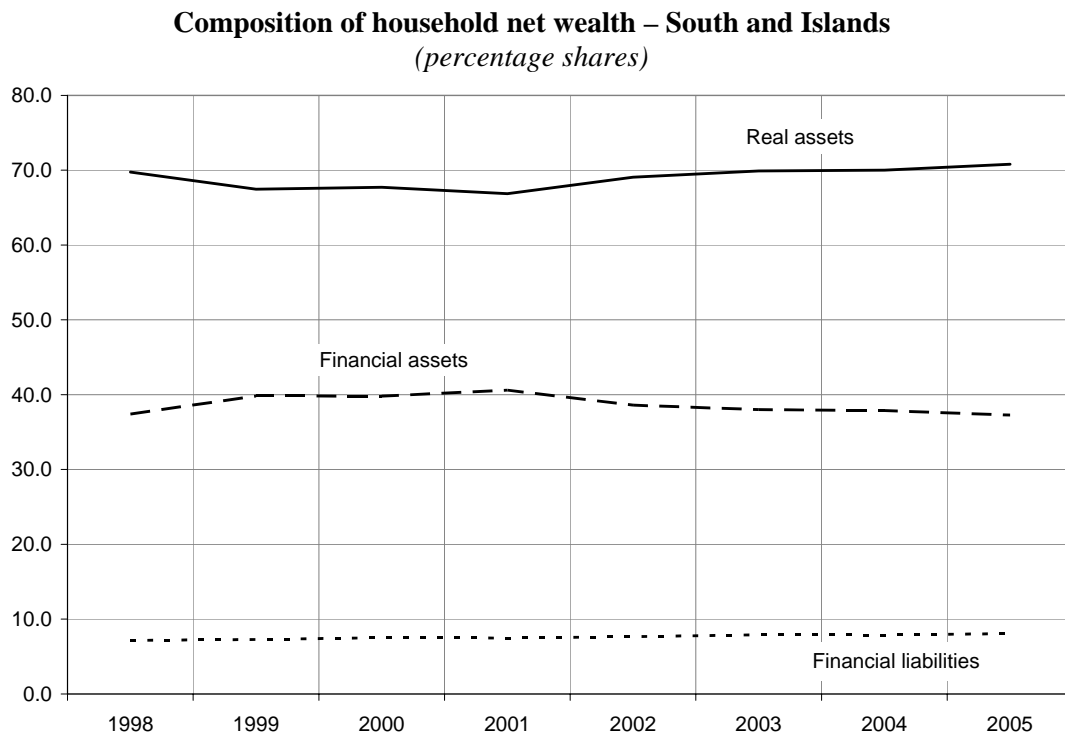


Figure 5

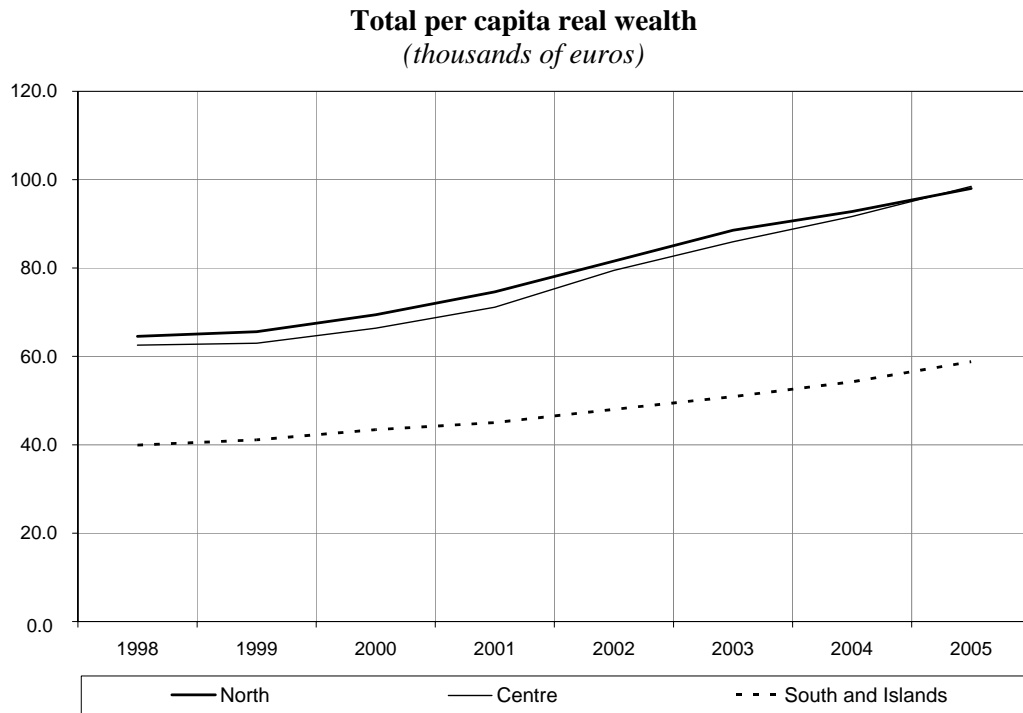


Figure 6

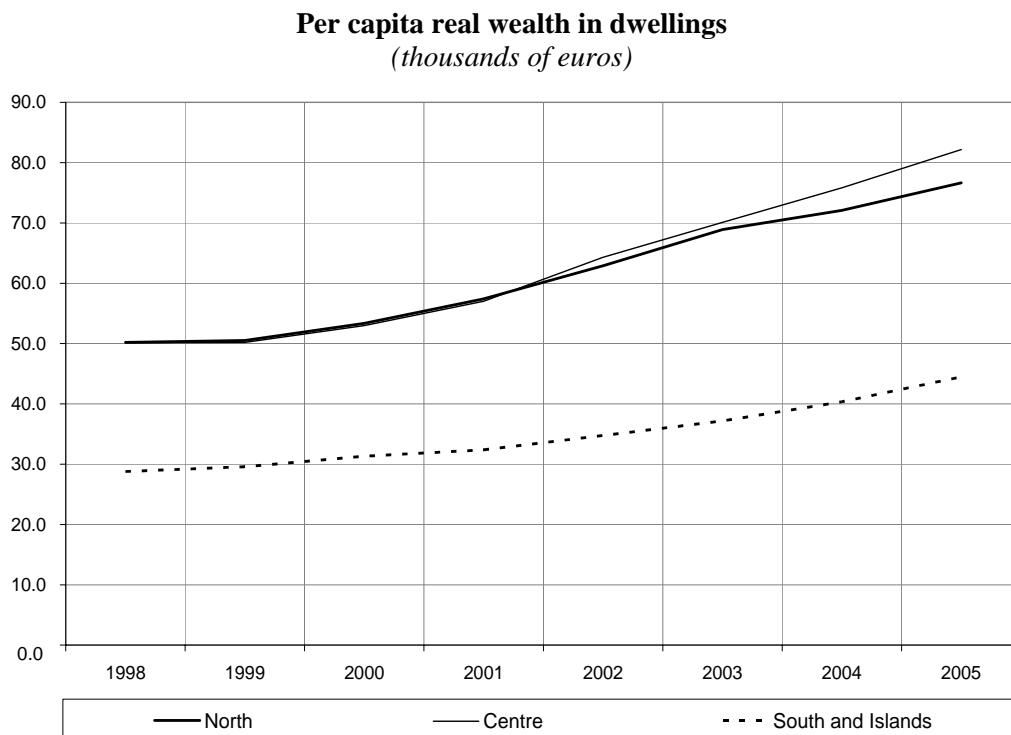
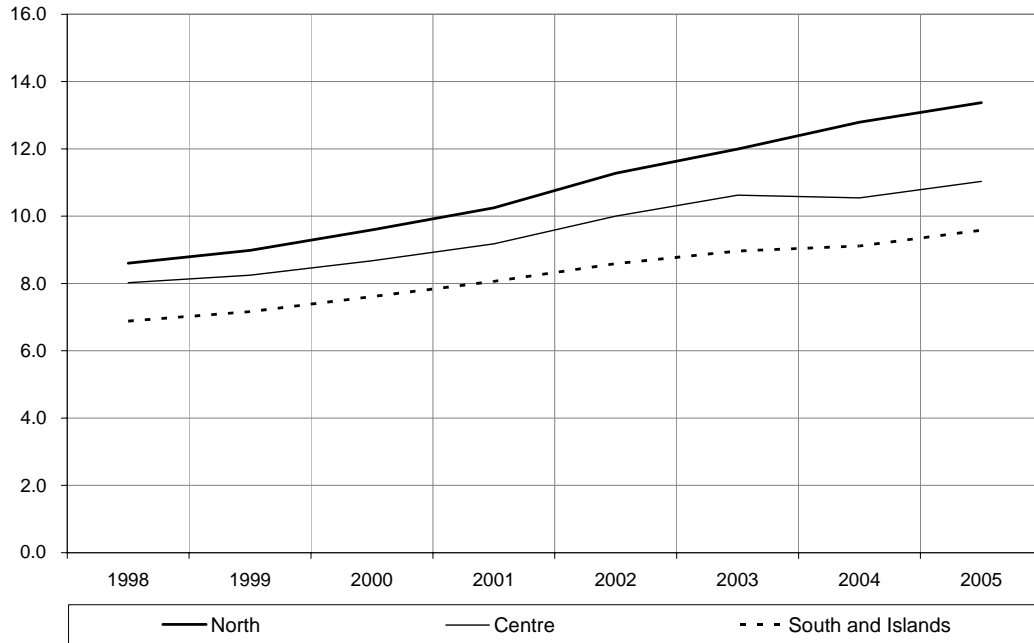


Figure 7

**Per capita real wealth in capital of producer households**  
(thousands of euros; including inventory and goodwill)



## APPENDIX B

### METHODOLOGY OF ESTIMATION OF REGIONAL REAL AND FINANCIAL WEALTH

National statistics on wealth are divided on the basis of homogeneous regional data.

#### A1. Real wealth by region

##### Dwellings

Value of the stock of dwellings occupied by residents: this was obtained multiplying prices by the building area.

*Prices.* The benchmark value at 2002 is based on “Consulente immobiliare” and “Agenzia delle entrate” (Tax agency) prices. It was calculated using Cannari and Faiella (in this volume) methodology. Before 2002 current prices were estimated applying the “Consulente immobiliare” growth rates to the benchmark, while “Agenzia delle entrate” growth rates were used after 2002.

*Dwelling areas.* Relating to 2001 the estimates were based on Istat Census regional statistics. For other years, areas were evaluated using the growth rates of regional stock of net capital of construction sector calculated by the perpetual inventory method (national depreciation rate was used for regional series).

Value of the stock of dwellings unoccupied by residents: building value, obtained as prices multiplied by areas, was divided by region using regional disposable income.

*Building areas unoccupied by residents in 2001.* Unoccupied building areas (square metres) were estimated using (Bank of Italy) SHIW (Survey of Household Income and Wealth) statistics with two adjustments: 1) correcting for the potential bias of the SHIW estimates using Census data. Thus, the estimate of the per-dwelling square meters of unoccupied houses, in 2001, was given by  $Y \cdot X$ , where  $Y$  is the ratio between the mean of the unoccupied dwelling areas and the mean of occupied dwelling areas, both estimated with SHIW data:  $Y = (\text{Total square meter/Number of dwellings})_{\text{unoccupied}} / (\text{Total square meter/Number of dwellings})_{\text{occupied}}$ , while  $X$  is the mean of occupied dwelling areas estimated by Census data:  $X = (\text{Total square meter}_{\text{census}} / \text{Number of dwellings}_{\text{census}})_{\text{occupied}}$ .<sup>21</sup> 2) The second adjustment aims at taking into account that not all unoccupied dwellings belong to physical persons. Therefore, the number of unoccupied dwellings is multiplied by the share of the number of dwellings occupied by physical persons in the total number of dwellings (the share is available only by *Census*, 1991).

Building areas for years different from 2001 were calculated, likewise occupied dwellings, using the growth rates of net capital stock of construction sector calculated by the perpetual inventory method. For the years 2004 and 2005 areas were estimated using 2003 regional shares (regional capital stocks were not available).

Finally, it was necessary to make a distinction between location and property, since not all the unoccupied dwellings are owned by residents (for example some touristic regions, such as Sardinia, have a significant share of unoccupied buildings owned by non-resident people). Therefore, the national value of unoccupied dwellings, calculated as

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<sup>21</sup> For example, if the SHIW data overestimated systematically the area with respect to Census data, the adjustment would lower the estimate.

previously illustrated, was broken down by region using regional disposable income shares.<sup>22</sup>

Total dwelling value: (regional occupied dwelling value)+(regional unoccupied dwelling value).

### **Land**

Regional estimates are provided by INEA statistics.

### **Producer households' (PH) stock of capital**

Regional producer households' stock of capital is divided in two parts: 1) "non-residential constructions" and 2) "plants, machinery and equipment". These are the steps for the estimation:

- 1) First, we calculated the regional PH stock of capital on the basis of the regional shares of employees in that sector (share of sole proprietorships, *de facto* companies and ordinary partnerships with no more than 5 employees), and the stock of regional net capital calculated with the perpetual inventory method. Thus, regional PH capital stock:  $(RPHKTOT) = (\text{PH employees} / \text{total employees}) * (\text{Regional net stock of capital at constant prices})$ , for each region and sector. The calculation is based on Istat data: *Census* and *Regional accounts*.
- 2) In order to obtain the PH regional stock of capital divided into "non-residential constructions" and "plants, machinery and equipment", we used the national shares of these two types of investment goods. Thus, we calculated:  $Q_1 =$  national share of capital in "non-residential construction" for each sector (national net capital at constant price for that sector); and  $Q_2 =$  national capital share in "plants, machinery and equipment" for each sector (national net capital at constant prices for that sector). The shares were calculated as averages over the time period 1995-2005 using Istat data (*National accounts*).
- 3) Finally, we calculated the regional PH capital stock in "non-residential construction" for each sector as:  $(RPHKCons) = (RPHKTOT) * Q_1$ ; and regional PH capital stock in "plants, machinery and equipment" for each sector as:  $(RPHKMach) = (RPHKTOT) * Q_2$ .

### **Producer households' inventory and goodwill**

The partition of regional shares of PH inventory and goodwill was estimated using regional PH value added:  $\text{Regional PH value added} = \sum_{\text{sector}} (\text{Value Added})_{\text{region,sector}} * (\text{PH ratio})_{\text{region,sector}}$ .

### **Valuables**

The regional shares used to estimate valuables were the same as those employed for durable goods.

### **Durable goods**

Durable goods by region were estimated using the regional shares of the stock in durables, the latter calculated using the perpetual inventory method applied to the data of households' regional expenditure in durable goods (source: Istat, *Regional accounts*).

<sup>22</sup> Note that this problem was not considered for occupied houses since we assume that all occupied dwellings are occupied by residents. Even though cases of occupied dwellings owned by non residents could exist (e.g for dwellings owned by non-residents but rented to residents) we predict only a marginal bias in these cases.

## **A2. Financial wealth by region**

### **Financial assets**

#### **Currency**

The national stock is disaggregated using the statistics on GDP (source: Istat, *Regional accounts*; years: 2000-2005).

#### **Bank deposits**

The item includes certificates of deposit. The national stock is disaggregated using statistics on bank deposits (source: Supervisory reports<sup>23</sup>).

#### **Postal savings**

This category comprises postal saving books and certificates and postal current accounts.

The postal saving books and certificates are disaggregated by regional “Cassa Depositi e Prestiti” statistics. As these data are not classified by sectors, we have assumed that the total amount of postal saving books and certificates is owned by households.

Regarding postal current accounts, regional shares are obtained by using postal current accounts by geographical area (source: Poste Italiane spa; years 2001-2005)<sup>24</sup> and bank current accounts within any area.

#### **Securities**

The aggregate contains securities issued by the Italian Government, Italian bonds (issued by enterprises and banks) and foreign securities.

Regional estimates are obtained using the Supervisory reports on both securities held in custody and in individually managed portfolios.

#### **Shareholders’ loans to co-operative societies**

National data are disaggregated by area using the “Lega delle Cooperative” statistics (year: 2004).<sup>25</sup> Within any area, regional estimates are obtained using the number of shareholders in consumers’ co-operative societies (source: Lega delle Cooperative; year: 2005).

#### **Shares and other equity**

The item is disaggregated at the regional level by using both Italian and foreign shares held in custody or in individually managed portfolios. For further information see Banca d’Italia (2003), and the Methodological Appendix section in Banca d’Italia (2007).

#### **Shares in quasi-corporations**

Regional estimates are obtained by using the number of private partnership societies<sup>26</sup> (source: Istat, *Census*, 2001).

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<sup>23</sup> Data from the Supervisory reports always refer to the period 1998-2005.

<sup>24</sup> Poste Italiane’s statistics do not provide sector data by area. We have attributed the total amount to households, since their share represents almost 100 per cent of the aggregate.

<sup>25</sup> The data cover the first 100 co-operative societies, which represent almost 100 per cent of the stock of shareholders’ loans.

<sup>26</sup> They include private, unlimited and limited partnership societies.



**Investment fund units**

The national aggregate contains both Italian and foreign investment fund units.

The national stock is disaggregated using Italian investment fund units held in custody or in individually managed portfolios (source: Supervisory reports).

**Insurance technical reserves**

The aggregate includes pension funds, life and casualty insurance reserves.

Pension funds comprise both new issued funds (occupational and open funds established after the reform of 1993) and pre-existing funds. Regional estimates of the new issued funds are obtained using the number of subscribers by area (source: Covip; years: 1999-2005) and disposable income within any area (source: Istat; years of availability: 1998-2002). As for the pre-existing funds regional estimates are based on the number of bank branches (source: Siotec).

Regional estimates of life and casualty<sup>27</sup> insurance reserves are obtained summing up the last ten-year life insurance premiums (source: Isvap; years: 1990-2005).

**Trade credits**

The national stock is disaggregated on the basis of full-time equivalent self-employment (source: Istat, *Regional accounts*; years: 1998-2005).

**Other financial assets**

The item is disaggregated using statistics on bank deposits (source: Supervisory reports).

**Liabilities****Loans**

The item contains loans to consumer and producer households issued by both banks and special financial intermediaries (*ex art. 107* of the Italian Law on Banking). As for consumer households, mortgage loans represent the main component of medium and long-term loans, while consumer credit has the largest share among short-term liabilities. Loans to producer households represent the residual component. The national stock is disaggregated by means of the statistics on loans issued by both types of intermediaries.

**Technical reserves**

We assume that technical reserves are composed of pension funds held by producer and consumer households' employees.

Regional estimates are obtained using the number by region of producer households' employees working in the industry and services sectors (source: Istat, *Census*, year 2001) and of consumer households' employees (source: INPS, *Osservatorio sui lavoratori domestici*, years: 1999-2004). Weights for consumer and producer households are calculated using the full-time equivalent employment (source: Istat, *Regional accounts*; year 2000).

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<sup>27</sup> The weight of this component on the total amount of insurance reserves is marginal; besides, data on casualty premiums are unavailable.

### **Trade debts**

This stock is disaggregated on the basis of the full-time equivalent self-employment (source: Istat, *Regional accounts*; years: 1998-2005).

### **Other liabilities**

The item, which represents about 15 per cent of total financial liabilities, includes liabilities given by the difference between flows on an accrual basis and those on a cash basis, consisting mainly of taxes and social security contributions and social benefits. The national stock is disaggregated using the statistics on GDP (source: Istat, *Regional accounts*, years: 2000-2005).

## **LIST OF ABBREVIATIONS**

- Consob – *Commissione nazionale per le società e la borsa*  
Companies and stock exchange commission
- Covip – *Commissione di vigilanza sui fondi pensione*  
Pension fund supervisory authority
- INEA – *Istituto nazionale di economia agraria*  
National institute of agrarian economy
- INPS – *Istituto nazionale per la previdenza sociale*  
National social security institute
- Istat – *Istituto nazionale di statistica*  
National institute of statistics
- Isvap – *Istituto per la vigilanza sulle assicurazioni private e di interesse collettivo*  
Supervisory authority for the insurance industry
- Siotec – *Sistema informativo dell'organizzazione territoriale degli enti creditizi*  
Local credit institution information system

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**DISCUSSION OF THE PAPER BY G. ALBARETO, R. BRONZINI, D.  
CAPRARA, A. CARMIGNANI AND A. VENTURINI**

*Giuseppe Della Torre\**

**1. Contents, main results and comparison with previous research**

1. The paper, part of a thirty-year-long research project by the Bank of Italy, puts forward new estimates of the real and financial wealth of Italian households, broken down by region, for the years 1998-2005.<sup>1</sup> Bank researchers have also, more recently, begun to inquire into the geographical distribution of wealth.<sup>2</sup>

The work of Albareto *et al.* offers two major improvements over the preceding literature. First, it covers previously excluded real and financial aggregates (the fixed capital, stocks and goodwill of producer households; pension fund reserves; trade credits; “social loans” of consumer cooperatives; and the equity of “quasi-corporations”). Second, the estimates use a new series of house prices, correcting earlier overestimation.

The authors revise the value of the real component of wealth significantly downward, most sharply for the Centre and the North of Italy, somewhat less so for the South (their estimates are 72, 73 and 81 per cent of those of Cannari, D’Alessio and Paiella (2006) for the three parts of the country). It is worth underscoring that this adjustment occurs notwithstanding the inclusion of the new components.

The reduction in downward adjustment of households’ real wealth at current prices depends on the use of a more accurate house price index than in Cannari, D’Alessio and Paiella (2006, p. 288, note 11). The new index, the authors note, “takes account of the prices of houses in small towns, not just of new houses in provincial capitals”.

2. The paper provides ample material for reflection on a number of significant aspects of regional economic analysis, possible lines of inquiry that I shall not rehearse as they will be covered, in part, in Session 3 tomorrow. Instead, I shall discuss some of the paper’s most interesting conclusions.

The new estimates show the substantial regional disparities in net per capita real and financial wealth. The authors effect a comparison, for 2004, with the estimates of Cannari, D’Alessio and Paiella (2006), which they take as benchmark. Setting the estimate for the North equal to 100, Cannari, D’Alessio and Paiella (2006) get values of 89 for the Centre and 44 for the South, whereas Albareto *et al.* get values of 87 and 50, respectively. That is, they diminish the weight of the Centre (from 89 to 87) and increase that of the South (from 44 to 50). The new estimates, moreover, produce a different ranking of the regions according to per capita real wealth.

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<sup>1</sup> See Ignazio Visco’s introductory remarks in this volume.

<sup>2</sup> As examples, see Magnani (1997), De Bonis and Lovino (1997), Berrettoni *et al.* (1999), Cannari and D’Alessio (2003), Cannari, D’Alessio and Venturini (2003), Cannari, D’Alessio and Paiella (2006). True, the definitions of wealth, the estimation criteria and the time periods in these works are different from those of Albareto *et al.* For a brief review of the studies done within the Bank of Italy, see Cannari, D’Alessio and Paiella (2006), pp. 267-268.

The paper confirms the findings of Cannari, D'Alessio and Paiella (2006) on the sharp geographical disparities within Italy,<sup>3</sup> but with some differences that should be emphasized and fully brought out. For one thing, the disparity between North and South is attenuated. Second, the regional ranking is changed. This is an intriguing point, bringing to mind a question that I should like to put to the authors. The comparison with the data in Cannari, D'Alessio and Paiella (2006) is only for 2004 and thus indicates just the "level" of the discrepancy in that year. It might be interesting to extend the comparison to the entire period that the two works have in common, i.e. 1998-2004, so as to get an idea of the trend in the discrepancy in the values of the real and financial components of wealth over time. In fact, in terms of economic analysis, the process of asset revaluation has significant impact on spending and saving decisions, and the dimensions of the process are significant during this period.

## 2. The geographical distribution of GDP as criterion for liquidity assignment

I was particularly struck by the magnitude of one aspect of the geographical distribution of which my perception had been what you might call "qualitative". This is the North-South gap in the weight of real as against financial assets, risky as against safe financial assets, and liquidity (cash and postal deposits in particular).

There is a substantial literature on this point explaining the importance of real as against financial assets in the South, and among the latter the greater weight of safe and specifically liquid assets. The determinants generally mentioned include such factors as the South's lower level of total wealth, greater perceived uncertainty about future incomes, and low levels of social capital (Guiso, Sapienza and Zingales, which the paper cites). In addition to the social, demographic and economic characteristics of the population, other relevant factors involve the supply of banking services (fewer branches and e-money terminals (Cannari, D'Alessio and Paiella, 2006, pp. 285-286)),<sup>4</sup> which are said to weigh on households' financial choices in the South.

The possible causes of the differing composition of real and financial wealth in the South by comparison with the Centre and North are numerous, so inquiry in this field requires indicators that are targeted to the territorial distribution of financial items that are far removed from the Bank of Italy's supervisory sphere and prudential reporting requirements: in particular, holdings of banknotes.

The procedure adopted by Albareto and his co-authors to disaggregate nationwide holdings of banknotes on a regional basis consists simply in following the distribution of GDP. This criterion, in fact, is standard in the Bank's analyses, such as Magnani (1997, p. 41) and Berrettoni *et al.* (1999, p. 13).<sup>5</sup>

As I see it, using GDP as the gauge of the distribution of cash in circulation could well produce an overestimate of the figure for the Centre and North and an underestimate for the South, although the paper's reference to households as consumers and as producers does constitute an argument in favour of that approach. In my view, the bottlenecks in the supply of financial services – indicated by the importance of postal

<sup>3</sup> Rough-and-ready assessments of my own suggest that the other, earlier works along these lines also confirm the marked geographical polarization in the distribution of household wealth. For net household wealth in proportion to GDP in southern and northern Italy, 1972-1992, see Magnani (1997, Figure 1). For average per capita wealth in 1995-2000 by region, see Cannari and D'Alessio (2003, Table 7). For net wealth, 1991-2001, see Cannari, D'Alessio and Venturini (2003, Table B.1). And for securities in custody with the banking system, 1990-1996, by region, see De Bonis and Lovino (1997, Table 3).

<sup>4</sup> However, Arciero *et al.* (2006, pp. 306, 309) appear to take a less rigid position.

<sup>5</sup> Cannari and D'Alessio (2003, p. 77), however, refer to "the distribution of notes and coin according to a survey [not specified] conducted by the Bank of Italy."

deposits in the South (the geographical attribution of these assets being reliable) – together with the economic, social and demographic factors mentioned, counsels special care in specifying the factors relevant to the geographical assignment of liquidity (Arciero *et al*, 2006, p. 312). I wonder whether we might not do well to consider, in addition to GDP, such things as the share of the illegal and underground components of total output, the diffusion of ATM and POS terminals, and the number of bank and post office branches.

I am well aware that in recent years the item “banknotes” does not weigh very heavily in total financial wealth at national level. At the end of 2005 they represented about 2 per cent of total financial assets in Italy, but this rises to 2.7 per cent in the South and Islands (Tables 4 and 5 in the paper). Given the relatively low level of this item nationally, a different geographical distribution of holdings of banknotes based on alternative criteria is not likely to make a significant contribution, unless there is very marked polarization (which, however, cannot be ruled out in advance).

### **3. A matter of editing, and of substance**

It is important for applied economic researchers to be apprised immediately, in a publication, of the definitions used for macroeconomic variables and the way in which they are constructed statistically. Obviously there are excellent reasons for placing this information in compact form in a statistical or methodological appendix, but this common practice may lead less attentive readers, or those less directly involved in that aspect of the study, into error. Further, there is no denying that the statistical data made available always reflect a mix of the theory that demarcates their content and the operative choices that determine their practical definition in producing statistical estimates. The point here is that Albareto and his colleagues should shift their account of some of the criteria used in determining the geographical distribution of real and financial aggregates from the Appendix to the main body of the text, at least in broad outline.

### **4. Three brief suggestions**

In closing let me express my great appreciation for this essay, which will be the basis for interesting further developments in various branches of economic analysis. This appreciation extends to the other researchers here at the Bank who have made and are still making contributions in this sphere.

To sum up, I think the authors of this work could improve it in three ways:

1. by extending the comparison of their results with those of earlier works (in particular Cannari, D’Alessio and Paiella, 2006) to all the years for which this is possible;
2. by adopting other criteria in addition to GDP to determine the distribution of banknotes in circulation, an item that is of modest size nationally but substantial in some parts of the country;
3. by including a discussion, possibly in the main body of the text, of the most interesting implications of their criteria for the geographical distribution of wealth, which is now found in the Methodological Appendix.

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## **METHODOLOGICAL ISSUES**

*Chairman: Giorgio Calcagnini, University of Urbino “Carlo Bo”*



# HOUSE PRICES AND HOUSING WEALTH IN ITALY

*Luigi Cannari\* and Ivan Faiella\**

## 1. Introduction

Houses constitute a significant share of households' wealth and housing-related expenses are an important part of their expenditure. House-price dynamics are a key factor in the process of reallocation of household wealth (Davies and Shorrocks, 2000) interacting with financial asset prices (Sutton, 2002) and conditioning labour mobility (Cannari, Sestito and Nucci, 2000). This central role notwithstanding, in most industrialised countries statistics on house prices and housing wealth are not readily available (Kennedy and Andersen, 1994; Kneeshaw, 1995; Muzzicato, Sabbatini and Zollino, 2002).<sup>1</sup> This informative gap is especially annoying for countries, such as Italy, where households' preference for housing wealth is very strong (Brandolini *et al.*, 2004; Faiella and Neri, 2004), partly owing to their the marked orientation towards owner-occupation (Paiella, 2001; Di Addario, 2002).

In Italy, official estimates are still not available at the macroeconomic level;<sup>2</sup> micro-level data on family holdings of tangible assets have been gathered since the 1960s in the Bank of Italy's Survey of Household Income and Wealth (SHIW) and constitute a substantial source of information on housing, although survey data are affected by under-reporting of dwellings (Cannari and D'Alessio, 1990). Some recent studies present estimates of Italian housing assets, combining this source of information with estimates from the National Accounts and other data (Brandolini *et al.*, 2004; Cannari, D'Alessio and Paiella, 2006).

The present paper aims to estimate the value of dwellings at both micro and macro level in Italy in 2002, by geographical area. Estimates of the market value of house prices obtained from different sources are presented and compared with the implicit prices obtained from the SHIW. Subsequently, an appraisal of the total surface area derived from estimates based on the figures of the 2001 Italian Census are used to evaluate housing assets by geographical area, and these amounts are compared with the SHIW figures. Finally, the main conclusions are drawn. The Appendix (by A. Bassanetti and F. Zollino) illustrates the method used to reconstruct the annual series of the housing wealth of Italian households, including census-based estimates now available for the years 1991 and 2001.

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<sup>1</sup> Nonetheless the importance of this information is widely recognised. In a recent speech delivered at the Second ECB Conference on Statistics, the President of the ECB remarked that "[...] the ECB attaches great importance to improving further the availability, timeliness and other qualities of the Principal European Economic Indicators and to receiving more elaborate and consistent euro area statistics for assessing and analysing productivity changes, for service activities and for housing, including house prices.", Trichet (2004).

<sup>2</sup> At the time of writing, the Italian National Statistical Office (Istat) is setting up the methodology to produce a national housing price index.

## 2. House prices

### 2.1 Estimates based on market transactions

In Italy, as in many other industrialised countries, there is no official source of macroeconomic information on house prices. Data are collected regularly by an agency of the Ministry of Finance (*Osservatorio Mercato Immobiliare dell'Agenzia del Territorio*) and by two private sources: *Nomisma* and *Il Consulente Immobiliare*. The *Osservatorio Mercato Immobiliare dell'Agenzia del Territorio* (OMI) is the most comprehensive source of information on house prices in Italy; it collects data for a very large number of transactions, more than 750,000 in 2002. *Nomisma*, an economic think-tank, publishes a semi-annual national index of house prices, based on data collected by real-estate agents; *Il Consulente Immobiliare* (CI), an industry-related review published by *Il Sole 24 Ore* media group, gathers information on actual sales of new and recently built houses (not older than 35 years) from real-estate agents in more than 1,000 Italian municipalities. While the *Nomisma* survey may be preferable for aggregate analysis, thanks to its more homogeneous methodology over time, the OMI and the CI have the advantage of deeper geographical coverage. Given that the determinants of house prices mainly operate at local level (ECB, 2003), to estimate the benchmark of house prices we use the OMI and the CI.

Both have their pros and cons. The OMI has the advantage of wider geographical coverage, because it collects data for each Italian municipality, while the CI takes into consideration only a share of municipalities. On the other hand, CI data are likely to be of better quality: data on house prices are based on market transactions surveyed by real-estate agents only, while the OMI relies on information collected by real estate agents, on assessments carried out by technicians of the Ministry's local agencies and on information drawn from contracts of sale, where prices are usually under-reported in order to evade taxes.<sup>3</sup> We therefore resort to both sources to estimate our benchmark of house prices. First, we impute data for the missing municipalities in the CI data set. Second, using each of the two sources separately, we estimate an average house price for each municipality averaging the three prices<sup>4</sup> by location based on the share of households living in each one and classifying the municipalities in four classes according to the population (the shares of households are estimated resorting to the SHIW); finally we combine the filled CI data set and the OMI data set.

#### 2.1.1 Filling the CI data set

In the second half of 2002, the CI collected data on house prices in 1,234 – out of 8,101 – Italian municipalities;<sup>5</sup> 56 per cent of Italian dwellings are located in the municipalities surveyed (Table 1). The CI survey is not based on a random sample. It collects data in the most important municipalities, while small ones are likely to be selected according to the thickness of the market for secondary dwellings (e.g. vacation homes).

<sup>3</sup> Only a small share of information is collected through this channel and the data are somehow adjusted to correct for this under-reporting.

<sup>4</sup> These prices are the simple average of the minimum and maximum quotations. Averaging the minimum and maximum quotation in each area provides an estimator which is not representative of the distribution of house prices given its right-skewness (see Figure 1 in the text). Taking the median should solve this problem when this information is available in the future. According to SHIW 2004, the median value at nuts 1 level amounts to 90 per cent of the average value.

<sup>5</sup> The 103 provincial capitals are included in the CI sample.

Table 1

**Coverage of the CI sample: municipality and total dwellings, 2002**

Municipality size (inhabitants)	Covered by the CI sample		Not covered by the CI sample		Total	
	Dwellings (per cent)	Municipalities	Dwellings (per cent)	Municipalities	Dwellings (per cent)	Municipalities
Under 20,000 .....	13	878	39	6,757	52	7,635
From 20,000 to 40,000.....	10	198	4	91	13	289
From 40,000 to 500,000...	22	152	2	19	23	171
More than 500,000 .....	11	6	-	-	11	6
<b>Total .....</b>	<b>56</b>	<b>1,234</b>	<b>44</b>	<b>6,867</b>	<b>100</b>	<b>8,101</b>

Source: CI data. Data on dwellings are based on estimates of the 2001 Census.

For each municipality, the CI gathers information on the prices of dwellings sited in three locations: town centre, outskirts, between outskirts and town centre. For the provincial capitals the CI collects data on prices of new and recently built houses; for the other municipalities house prices are collected for new houses or completely renovated houses – a slightly different concept.

Using the coefficients provided by the CI, we compute the ratio of the average price of recently built houses to the average price of new and completely renovated houses, and use this ratio (equal to 0.87) to downscale house prices in towns that are not provincial capitals.<sup>6</sup>

Thus, all our estimates are based on the prices of recently built houses (i.e. not older than 35 years). We believe that these prices are good proxies for the average value of the whole stock of houses, because new houses represent only a minor share,<sup>7</sup> while houses older than 35 years are likely to have been renovated in subsequent years (and their prices will not differ very much from those of recently built houses).<sup>8</sup>

Finally, we impute the house prices for the 6,867 municipalities not covered by the CI survey, using the following regression model, estimated on the 1,234 CI survey units:

$$P_i = \alpha_p + \beta_1 DIM_i + \beta_2 TOU_i + \varepsilon_i, \quad (1)$$

where  $P_i$  is the average house price for the  $i$ -th municipality,  $\alpha_p$  is a fixed effect at the provincial level<sup>9</sup> and  $DIM_i$  and  $TOU_i$  are categorical variables at the municipality level, respectively containing information on the population size of the municipality and on the share of firms operating in the tourism industry;  $\varepsilon_i$  is an error term. Data are

<sup>6</sup> In detail, we computed the ratio of the average value per square metre of recently built houses to that of new houses – equal to 0.77 – and inflated it by 13 per cent, using a CI technical coefficient to account for the fact that in the towns not provincial capitals CI prices are collected for new or completely renovated houses (see the annex “Appendice per le stime”, *Il consulente immobiliare*, spring 2003).

<sup>7</sup> According to the Census, in 1991 new dwellings (i.e. built in the last five years) were 4 per cent of the total and in 2001 dwellings built in the last ten years were 8 per cent.

<sup>8</sup> Pooling several waves of the SHIW, we verify that the average price of recently built houses is 99 per cent of the average price of the whole stock of houses.

<sup>9</sup> We used a regional fixed effect when the cell of donors contained less than 10 observations (40 out 103 provincial capitals). If the regional effect is used for those cells with less than 5 observations (7 out 103 provincial capitals), the results remain substantially unchanged.

weighted by the number of dwellings per municipality according to the 2001 Census (Table 2).<sup>10</sup>

Table 2

### Estimates of the house prices (per square metre) in the CI database, 2002

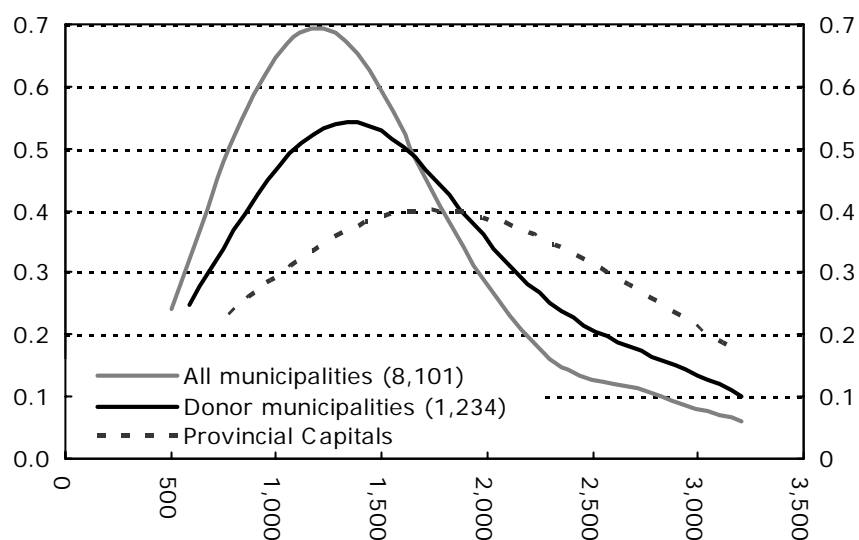
	Parameter estimates <sup>(1)</sup>	Standard errors <sup>(2)</sup>	T Value	Pr >  t
Intercept.....	2,738	321.81	8.51	<.0001
<b>Share of units operating in the tourism industry</b>				
Less than 5 per cent.....	-959	113.54	-8.45	<.0001
From 5 to 10 per cent.....	-838	112.55	-7.45	<.0001
From 10 to 20 per cent.....	-391	138.69	-2.82	0.006
More than 20 percent.....	<i>Base case</i>			
<b>Size of the municipality (inhabitants)</b>				
Less than 20,000.....	-1,093	298.14	-3.67	0.001
From 20,000 to 40,000.....	-913	297.08	-3.07	0.003
From 40,000 to 500,000.....	-681	283.10	-2.41	0.019
More than 500,000.....	<i>Base case</i>			
Number of observations	1,233 <sup>(3)</sup>	Sum of weights	14,838,209	
Adj. R-square	0.7202	Root MSE	367 (Denominator DF 76)	

(1) Fixed effects at the province level not shown in the table. – (2) Robust standard errors clustered at the province level. – (3) One extreme observation was zero-weighted.

Source: Our calculations from the CI database.

Figure 1

### Distribution of house prices: original and reconstructed values (euros per square metre, 2002)<sup>(\*)</sup>



(\*) Non-parametric estimation techniques. A normal function is used as kernel and the bandwidth is selected following a criterion that approximately minimises the asymptotic mean integrated square error (AMISE). See Pagan and Ullah (1999), pp. 49-54.

Source: Our calculations from the CI database.

<sup>10</sup> To test the out-of-sample predictive power of equation (1), a similar regression was estimated on SHIW data at municipality level. The SHIW regression presented the same covariates of equation (1) plus a dummy indicating the SHIW municipality was not covered by the CI (of the 344 SHIW municipalities surveyed in 2002, 112 were not covered by the CI). The coefficient of the dummy was not statistically different from zero (p-value=0.5128).

The distribution of house prices estimated through this equation exhibits a right skewness, with a modal value of around 1,200 euros per square metre. As shown in Figure 1, prices tend to be higher in towns that are provincial capitals than in the other municipalities surveyed. In addition, house prices tend to be lower in non-surveyed municipalities; this result is due to the bias in the CI sample, which under-represents small and non-tourist towns, where prices are lower. The average prices estimated from CI data for the full set of Italian municipalities are shown in Table 3.

Table 3

**House prices at regional level**  
(Average price per square metre, recently built houses, 2002)

	Regions	Provincial capitals	Towns not provincial capitals	Regional capitals	
Piedmont .....	1,289	1,569	1,178	Turin .....	1,667
Valle D' Aosta .....	2,066	1,748	2,124	Aosta .....	1,748
Lombardy .....	1,755	2,651	1,484	Milan .....	3,210
Trentino A.A. ....	1,838	2,108	1,777	Trento .....	1,741
Veneto .....	1,583	1,893	1,494	Venice .....	2,455
Friuli .....	1,271	1,367	1,224	Trieste .....	1,515
Liguria .....	2,254	1,974	2,443	Genoa .....	2,043
Emilia Romagna ..	1,628	1,863	1,494	Bologna .....	2,319
Tuscany .....	1,593	1,799	1,493	Florence .....	2,409
Umbria .....	1,214	1,272	1,188	Perugia .....	1,376
Marche .....	1,365	1,667	1,299	Ancona .....	1,627
Lazio .....	1,971	2,577	1,315	Rome .....	2,712
Abruzzo .....	1,136	1,234	1,115	L' Aquila .....	1,184
Molise .....	891	1,105	851	Campobasso .	1,212
Campania .....	1,275	1,911	1,095	Naples .....	2,058
Puglia .....	962	1,261	891	Bari .....	1,522
Basilicata .....	981	1,292	919	Potenza .....	1,211
Calabria .....	823	1,022	784	Catanzaro .....	1,073
Sicily .....	894	1,194	776	Palermo .....	1,438
Sardinia .....	994	1,136	962	Cagliari .....	1,276
<b>Geographical area</b>					
North-West .....	1,687	2,168	1,509		
North-East .....	1,588	1,820	1,495		
Centre .....	1,712	2,238	1,366		
South and Islands .....	1,014	1,358	919		
<b>ITALY .....</b>	<b>1,436</b>	<b>1,898</b>	<b>1,259</b>	<b>Total .....</b>	<b>2,259</b>

Source: Our calculations from the CI database.

### 2.1.2 OMI data and the combined OMI-CI estimates

House prices based on the OMI data set are displayed in Table 4. For regional and provincial capitals, the OMI average price is about 10 per cent lower than the CI average price; the difference between the two sources is greater when we take into consideration non-provincial capitals (-25 per cent). The discrepancy for non-provincial capitals is probably due in part to the criteria adopted by the CI when selecting the municipalities

surveyed and our adjustment method based on tourism vocation and demographic size of the municipalities is not powerful enough to remove entirely this upward bias; it is also plausible that OMI data are less reliable in small towns, where real-estate agents are fewer and the number of transactions is limited. Thus, we generate our benchmark by averaging the estimates from both sources. At national level we take the simple average from the two sources. At local level the two sources are assigned an equal initial weight. These weights are then modified to account for the relative market thickness using the so-called IMI% (the share of the total housing stock marketed in the year).<sup>11</sup> Where the regional IMI% is above the national measure the OMI relative weight is increased proportionally (and consequently the CI weight is decreased). The reverse happens when the regional IMI% is below the national value.

Table 4

**House prices at regional level**  
(Average price per square metre, all houses, 2002)

	Regions	Provincial capitals	Towns not provincial capitals	Regional capitals
Piedmont .....	1,100	1,469	952	Turin ..... 1,653
Valle D' Aosta .....	1,340	1,547	1,302	Aosta ..... 1,547
Lombardy .....	1,430	2,294	1,169	Milan..... 2,692
Trentino A.A. ....	1,791	2,647	1,597	Trento..... 1,707
Veneto .....	1,143	1,494	1,042	Venice ..... 1,831
Friuli.....	977	1,238	848	Trieste ..... 1,187
Liguria.....	1,524	1,443	1,578	Genoa..... 1,418
Emilia Romagna.....	1,401	1,822	1,161	Bologna..... 2,520
Tuscany.....	1,538	1,844	1,388	Florence ..... 2,352
Umbria .....	1,025	1,110	987	Perugia ..... 1,112
Marche .....	1,116	1,379	1,059	Ancona..... 1,423
Lazio .....	1,726	2,504	884	Rome..... 2,655
Abruzzo.....	777	1,077	710	L' Aquila..... 1,138
Molise .....	671	1,050	600	Campobasso .... 1,113
Campania .....	1,036	1,752	833	Naples ..... 1,920
Puglia .....	674	830	637	Bari ..... 964
Basilicata.....	543	991	454	Potenza..... 1,072
Calabria.....	479	701	436	Catanzaro ..... 723
Sicily .....	695	953	594	Palermo ..... 995
Sardinia .....	828	1,231	737	Cagliari..... 1,436
<b>Geographical area</b>				
North-West.....	1,343	1,859	1,152	
North-East.....	1,286	1,692	1,123	
Centre.....	1,533	2,179	1,107	
South and Islands .....	756	1,125	654	
<b>ITALY.....</b>	<b>1,161</b>	<b>1,712</b>	<b>950</b>	<b>Total ..... 2,034</b>

Source: Our calculations from OMI data.

<sup>11</sup> For the computational details see *Agenzia del territorio* (2002).



The benchmark is displayed in Table 5. The territorial distribution of house prices confirms Italy's dualism: in seven out of eight southern Regions (Abruzzo, Molise, Campania, Puglia, Basilicata, Sicily and Sardinia), house prices are less than 80 per cent of the national average. Higher prices turn out to be correlated with the tourism inclination of regions and the presence of the largest Italian towns (Rome and Milan, above all).

Table 5

**Benchmark for house prices at regional level**  
(Average price per square metre, 2002)

	Regions	Provincial capitals	Towns not provincial capitals	Regional capitals	
Piedmont .....	1,193	1,518	1,063	Turin .....	1,660
Valle D' Aosta .....	1,769	1,666	1,787	Aosta .....	1,666
Lombardy .....	1,549	2,425	1,284	Milan .....	2,882
Trentino A.A. ....	1,815	2,378	1,687	Trento .....	1,724
Veneto .....	1,311	1,646	1,215	Venice .....	2,069
Friuli .....	1,134	1,307	1,049	Trieste .....	1,362
Liguria .....	1,882	1,703	2,002	Genoa .....	1,724
Emilia Romagna .....	1,490	1,838	1,291	Bologna .....	2,441
Tuscany .....	1,561	1,825	1,432	Florence .....	2,376
Umbria .....	1,120	1,192	1,088	Perugia .....	1,245
Marche .....	1,234	1,516	1,173	Ancona .....	1,520
Lazio .....	1,837	2,537	1,079	Rome .....	2,681
Abruzzo .....	990	1,170	950	L' Aquila .....	1,165
Molise .....	813	1,085	762	Campobasso ...	1,177
Campania .....	1,192	1,855	1,003	Naples .....	2,010
Puglia .....	845	1,086	788	Bari .....	1,295
Basilicata .....	839	1,195	769	Potenza .....	1,166
Calabria .....	719	925	678	Catanzaro .....	967
Sicily .....	823	1,108	711	Palermo .....	1,280
Sardinia .....	921	1,178	864	Cagliari .....	1,346
<b>Geographical area</b>					
North-West .....	1,535	2,032	1,352		
North-East .....	1,407	1,743	1,272		
Centre .....	1,603	2,202	1,209		
South and Islands .....	912	1,266	814		
<b>ITALY .....</b>	<b>1,299</b>	<b>1,805</b>	<b>1,105</b>	<b>Total .....</b>	<b>2,147</b>

Source: Data obtained by averaging OMI and CI datasets.

## 2.2 Estimates based on survey data

In Italy the main source of information on household housing wealth at the micro level is the Survey of Household Income and Wealth (SHIW) conducted by the Bank of

Italy since 1965.<sup>12</sup> The sample size is about 8,000 units per year. The basic survey unit is the *household*, defined as a group of individuals linked by ties of blood, marriage or affection, sharing the same dwelling and pooling all or part of their incomes. Institutional population is not included. Data are collected by means of personal interviews conducted by professionally interviewers.<sup>13</sup>

The SHIW data have the merit of being representative of the universe of Italian dwellings owned by households or rented to households (owing to the sampling nature of the survey); they include qualitative characteristics of dwellings (for instance, dwellings rated as luxury, upscale and so on, dwellings having two or more bathrooms, having an independent or centralised heating system)<sup>14</sup> and make it possible to link information on dwellings to the social and economic characteristics of households. On the other hand, the SHIW is affected by non-response and under-reporting; as in many other surveys, wealth is underestimated due to its high concentration and the low propensity of the wealthy to participate in the survey (Davies and Shorrocks, 2000; D'Alessio and Faiella, 2002). Therefore, the comparison between survey results and macroeconomic estimates can be useful to shed light on the quality of SHIW data.

We focused on the sub-sample of 5,679 households that own at least one dwelling (primary residence or not). Data on the value of rented houses are provided by the owners. Sampling weights were post-stratified according to the distribution of population by region, municipality size, sex and age of the household head (the main income-earner within the family).

In Figure 2 house prices per square metre resulting from the SHIW (with a 95 per cent confidence interval<sup>15</sup> and upper bound of the bias of the estimator, i.e. the coefficient of variation of the surface area estimates<sup>16</sup>) are compared with our OMI-CI benchmark.

Overall, survey-based estimates seems to conform very closely with OMI-CI prices. The price per square metre of the average Italian house in 2002 is 1,382 euros according to the SHIW and 1,299 euros according to OMI-CI-based estimates (-6 per cent). The coefficient of correlation between regional series is 0.82 and the root mean square error is 244 euros per square metre. Excluding four regions that present a limited sample size in the SHIW (for Valle d'Aosta, Basilicata, Molise and Trentino there are less than 90 households surveyed in each domain) the correlation coefficient rises to 0.93

<sup>12</sup> Information is publicly available since 1977. The reference is to the year for which, not in which, the survey is conducted.

<sup>13</sup> Further methodological details on the SHIW are given in Banca d'Italia (2004a) and Brandolini (1999).

<sup>14</sup> In the SHIW, dwellings are subjectively evaluated by respondents. All interviewees are asked the following question: "In your opinion, what price could you ask for the dwelling in which you live (if sold unoccupied)? In other words, how much is it worth (including any cellar, garage or attic)? Please give your best estimate". For home-owners and tenants, the answer provides the value of their principal residence.

<sup>15</sup> In computing those intervals, the standard error of the ratio estimator was calculated according to the SHIW sampling design.

<sup>16</sup> When a ratio  $R$  of two unknown population totals is estimated by the corresponding sample totals ( $r = \sum w_i v_i / \sum w_i s_i$ ), the resulting estimator is biased, but with an upper bound proportional to the relative variance of the estimator of the auxiliary variable (see section 5.6 of Särndal, Swensson and Wretman, 1992) computed as:

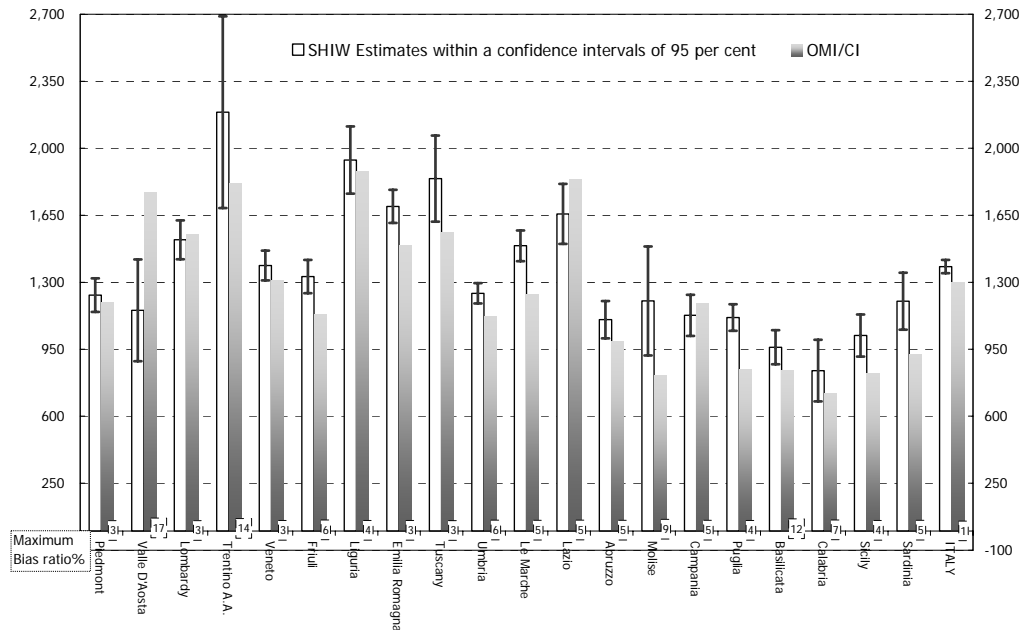
$$\frac{Bias(r)^2}{Var(r)} \leq \frac{Var\left(\sum_{i=1}^n w_i s_i\right)}{\left(\sum_{i=1}^n w_i s_i\right)^2}$$

the right-hand term tends to zero as sample size increases as will the left-hand term (the square of the bias ratio).

and the root mean square error falls to 178 euros per square metre.<sup>17</sup>

Figure 2

**House prices: survey estimates and their sampling variability**  
(euros per square metre, 2002)



Source: Our calculations based on SHIW and OMI-CI database.

Table 6

**House prices by location of the recently built dwellings**  
(euros, 2002)<sup>(\*)</sup>

	Outskirts	Between outskirts and centre	Centre	Total
<b>North</b>				
OMI-CI .....	1,270	1,577	1,800	1,483
SHIW.....	1,454	1,522	1,623	1,518
-/+ 1.96 standard errors.....	1,374 - 1,533	1,461 - 1,584	1,536 - 1,710	1,474 - 1,561
<b>Centre</b>				
OMI-CI .....	1,298	1,815	2,117	1,603
SHIW.....	1,476	1,704	1,853	1,646
-/+ 1.96 standard errors.....	1,383 - 1,569	1,593 - 1,815	1,648 - 2,058	1,564 - 1,727
<b>South</b>				
OMI-CI .....	748	923	1,068	912
SHIW.....	957	1,073	1,158	1,059
-/+ 1.96 standard errors.....	873 - 1,040	1,002 - 1,143	1,084 - 1,232	1,015 - 1,104
<b>Italy</b>				
OMI-CI .....	1,088	1,376	1,599	1,299
SHIW.....	1,305	1,396	1,474	1,382
-/+ 1.96 standard errors.....	1,253 - 1,357	1,352 - 1,441	1,411 - 1,537	1,351 - 1,412

(\*) Standard errors of ratios computed according to the sampling plan. The location of the dwelling in the SHIW refers to the principal residence.

Source: Our calculations based on SHIW and OMI-CI database.

<sup>17</sup> In those domains, the narrow size of the sample results in large confidence intervals; furthermore, a high bias ratio indicates that those intervals are not fully reliable.

The SHIW estimates appear to approximate OMI-CI prices well when the breakdown by location of the dwelling within the municipality is taken into consideration (Table 6).<sup>18</sup> The relative difference between SHIW point estimates and OMI-CI house prices is, on average, about +4 per cent, except for houses located in the centre where the SHIW underestimates OMI-CI prices and for dwellings sited in the outskirts or in southern part of Italy, where SHIW estimates are, on average, 15 per cent higher a OMI-CI values.

### 2.3 House-price dynamics

In the last decade there has been a sharp increase in house prices in the majority of developed economies. In the period 1995-2002, *The Economist* house-price index increased by 51 per cent in the US and by 35 per cent in the Euro area (corresponding changes in real terms were 27 and 19 per cent) (The Economist, 2003). What were the house-price dynamics in Italy? To answer this question we look again at the SHIW and other sources.

The first OMI data set on house prices was released in 2002 and therefore we cannot use this source before then. The CI has collected data on house prices in municipalities that are not provincial capitals since 2000. For the preceding years, data on house prices are available for provincial capitals only. The index estimated by Muzzicato, Sabbatini and Zollino (MSZ) and published by the Bank of Italy (Banca d'Italia, 2004b, p. 115) relies on these data; in particular, the MSZ index is based on the prices of new houses located in provincial capitals (for further details see Muzzicato, Sabbatini and Zollino, 2002).

As shown in Figure 3, according to the MSZ index, in the provincial capitals house prices (deflated by the consumer price index) increased by more than 60 per cent between 1987 and 1992; after a reduction, they exhibited little variation until mid-2000, when they reverted to a new phase of steep progression. The rise in house prices in the early years of the current decade has been fostered by several factors: the poor performance of share prices, which fell abruptly from 2000 to 2002, the low level of long-term interest rates, the tax credits for house renovation, the lengthening of the average duration of loan contracts, and the increase in financing as a proportion of the value of the property.<sup>19</sup>

Where regional differences are concerned, house prices exhibited stronger dynamics in the North and in the Centre than in the South and Islands. Although the pattern of house prices level is geographically differentiated, intra-regional differences tend to weaken. In 1992, when the real-estate market peaked, the variance of average house prices among the regions reached a maximum. In comparison with 1987, when house prices gained momentum, the coefficient of variation of prices had increased by more than a half. The dispersion among regional house prices tended to shrink thereafter; in 1996 the coefficient of variation returned to the 1987-88 values, showing moderate changes in the following years.<sup>20</sup>

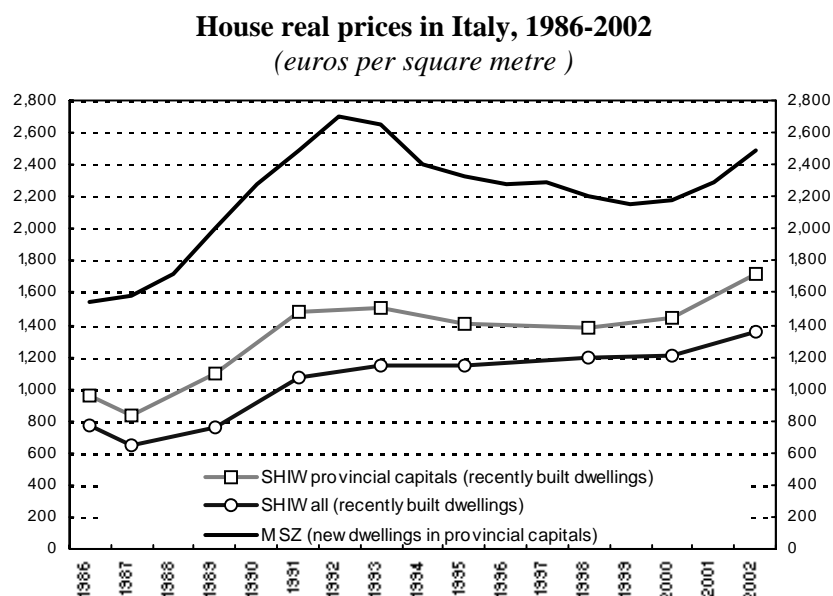
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<sup>18</sup> Due to the small number of observations resulting from the combination of dwelling location and region, the analysis is limited to three macro-region.

<sup>19</sup> For a general discussion on the main determinants of house prices see Fleming and Nellis (1990), Kennedy and Andersen (1994) and Tsatsaronis and Zhu (2004).

<sup>20</sup> Muzzicato, Sabbatini and Zollino (2002) point out that house price dispersion in the main towns tends to increase during market recessions; the phenomenon is evident particularly in the provincial capitals of the North and Centre of Italy. The authors focused on the variation between house price rates of change. Considering instead the variation between house price levels, the dispersion tended to diminish in the years following the 1992 peak.

Figure 3



Source: Muzzicato, Sabbatini and Zollino (2002) and our calculations based on SHIW. Data are deflated using the CPI.

For provincial capitals, SHIW data (Figure 3) draw a picture that is close to that of the MSZ index. The level of house prices is lower – because the SHIW is representative of the whole stock of houses while the MSZ index is based on new houses only – but the patterns of the two series are very similar.

For the whole set of municipalities, on the other hand, the SHIW time series is smoother and there is no reduction after 1992. These results suggest that the time variability of house prices may be greater in the provincial capitals than in small municipalities. The house-price dynamics shown by the MSZ index, might therefore not be fully representative of the changes in the average house price.

Therefore, we propose a new index, based on our calculation from the 2002 OMI-CI dataset, MSZ index and SHIW data. In particular, we establish a benchmark for 2002 based on OMI-CI data: the level of house prices per square metre in 2002 for the provincial capitals is set equal to 1,805 euros; that of towns that are not provincial capitals is set to 1,105 euros (Table 7). The time series for the provincial capitals is estimated backward multiplying the level of house prices in 2002 by the MSZ index; the time series for towns that are not provincial capitals is estimated backwards by multiplying the level of house prices in 2002 by the respective SHIW index.<sup>21</sup> The resulting series is a weighted average of these two series, with the relative number of dwellings – according to 2001 census estimates – as weights. Results are shown in Table 7. As far as the time profile is concerned, house prices in real terms increased by almost 60 per cent between 1986 and 1992, when they reached their peak. Afterwards prices remained substantially stable until 2000, when they started to pick up once more.

<sup>21</sup> For intra-survey years an interpolation combining SHIW and MSZ dynamics was used.

Table 7

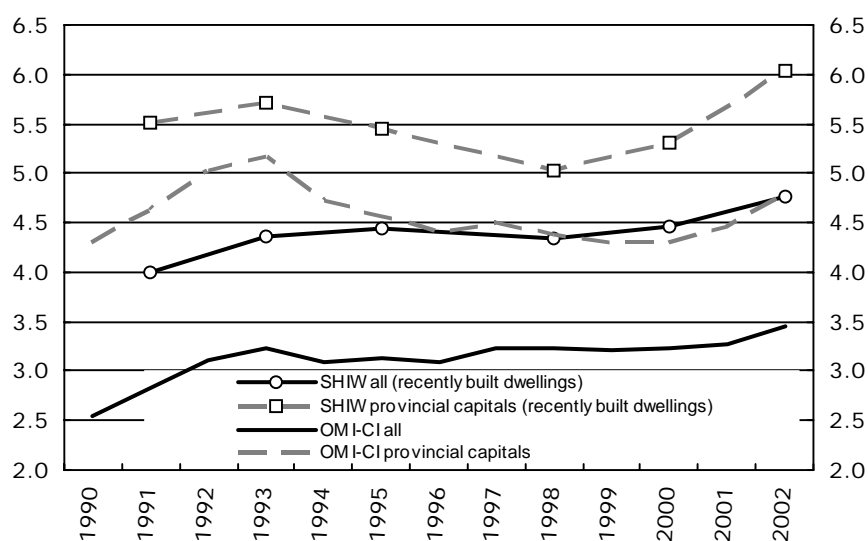
**House prices: reconstructed series**  
(Average price per square metre, recently built houses, 1986-2002)

	Provincial capitals	Towns not provincial capitals	Total			
	Weights according to Census 2001 (27.8 per cent of dwellings) (72.2 per cent of dwellings)		Nominal	Real	Nominal	Real
	<i>euros per square metre</i>			<i>percentage changes</i>		
1986	593	335	407	762	-	-
1987	635	295	389	696	-4.3	-8.7
1988	722	312	426	724	9.4	3.9
1989	896	361	509	814	19.6	12.5
1990	1,087	470	641	963	25.9	18.3
1991	1,262	586	774	1,094	20.7	13.6
1992	1,441	679	891	1,199	15.1	9.6
1993	1,476	707	920	1,188	3.3	-0.9
1994	1,394	723	909	1,127	-1.2	-5.1
1995	1,421	800	972	1,141	6.9	1.2
1996	1,447	849	1,015	1,155	4.4	1.2
1997	1,486	909	1,069	1,196	5.3	3.5
1998	1,454	927	1,073	1,181	0.4	-1.3
1999	1,444	935	1,076	1,161	0.3	-1.7
2000	1,500	987	1,129	1,187	4.9	2.2
2001	1,619	1,027	1,192	1,223	5.5	3.0
2002	1,805	1,105	1,299	1,299	9.0	6.3

Source: Our calculations based on SHIW and OMI-CI database.

Figure 4

**Ratio of house prices to household disposable income, 1990-2002**  
(percentages)



Source: Our calculations based on SHIW and OMI-CI database. Disposable income per household at the macro level is estimated using National Accounts data, at micro level it is estimated using SHIW data.

In the provincial capitals the ratio of house prices to household disposable income, after declining from almost 6 in 1992-93 to 4.5 in 2000, then began to rise anew; in 2002 it was close (according to OMI-CI data) or above (according to the SHIW) to the level of the previous peak. For the whole set of municipalities the profile is smoother; even in this case, the house-price-to-income ratio in 2002 was higher than in the previous decade (Figure 4).

### 3. Housing wealth in Italy

We consider the price index presented in the previous section to be the best benchmark available to track house prices in Italy until 2002.<sup>22</sup> Therefore, in this section we use this series to obtain macro estimates of housing wealth, evaluating the total dwelling surface area owned by Italian households in 2002 and extending the results to the 1991-2002 period.

The macro estimates of the main components of housing wealth (prices, number of dwellings and average surface area) are compared with those derived from the SHIW, and subsequently the time pattern of housing wealth according to the two sources is presented.

At the end of this section the distribution of housing wealth is evaluated after adjusting for the under-reporting of secondary dwellings in the SHIW.

#### 3.1 Estimates of dwelling surface area

In the previous sections we reached the conclusion that SHIW estimates of house prices compare very closely with those obtained from the OMI-CI database. In this section we look at the other two components of housing wealth: the average surface area of dwellings and the number of dwellings owned by households.

Information on the average surface area of occupied dwellings is provided by the 2001 Population Census.<sup>23</sup> According to the Census, the average surface area in square metres of occupied dwellings ranges from 82 in Val d'Aosta to 111 in Veneto, with a limited regional variance (the coefficient of variation is around 7 per cent). In comparison with census data, SHIW estimates tends to overestimate slightly the size of the occupied dwellings. While the Census presents an average surface area of 92 square metres (96 for occupied dwellings), the same measure according to the SHIW is about 13 per cent higher (12 per cent higher for occupied dwellings) (Table 8).<sup>24</sup> This outcome can be partly ascribed to the fact that dwellings occupied by persons other than the owner are more affected by under-reporting and, on average, are smaller than those that are owner-occupied.

In order to assess how SHIW data estimate the number of dwellings owned by households, we compare those figures with the numbers derived from the population

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<sup>22</sup> OMI data are available from 2002 onwards.

<sup>23</sup> OMI-CI prices correspond to the house value per Gross Internal Area (i.e. areas occupied by internal walls and partitions, columns, piers and other internal projections, internal balconies, stairwells, etc.), whereas we applied these prices to Census information (referring to Net Internal Area only). This method implies an underestimation of the total surface areas using Census information, the more reliable information that can be currently used as a benchmark.

<sup>24</sup> According to 2001 Census data, the average surface area of unoccupied dwellings corresponds to 80 per cent of the average surface area of occupied houses. The same ratio estimated on SHIW 2004 data is about 79 per cent.

Census.<sup>25</sup>

As shown in Table 9, the SHIW estimates are affected by a severe underestimation of secondary dwellings, as pointed out by Cannari and D'Alessio (1990) and Brandolini *et al.* (2004), who indicate that the total number of dwellings reported in the SHIW were about 75 per cent of census estimates (both referring to 1991). For 2002 this ratio is substantially unchanged. The figure is an average of the lower under-reporting (about 20 per cent) of occupied dwellings and the severe under-reporting (about 60 per cent) of dwellings that are not occupied.

Table 8

**Average dwelling surface estimate**  
(square metres, percentages)

Geographical areas	SHIW 1991			SHIW 2002			Occupied			
	Occupied	Not occupied	Total	Occupied	Not occupied	Total	Census 1991	Census 2001	SHIW coverage 1991	SHIW coverage 2002
	square metres						square metres		Percentages	
North-West .....	99.8	80.9	95.9	102.5	78.0	100.1	90.1	91.9	110.8	111.5
North-East.....	113.6	90.3	111.0	117.1	79.7	112.9	102.2	103.9	111.2	112.7
Centre.....	99.4	75.7	96.0	100.9	78.9	98.1	93.9	95.2	105.9	106.0
South and Islands.....	109.3	87.9	107.6	108.3	87.7	105.8	93.0	95.4	117.5	113.5
Italy .....	105.6	82.6	102.4	107.1	82.1	104.2	94.1	96.0	112.2	111.6

Source: Estimates based on SHIW 1991, 2002 and Census 1991, 2001.

Table 9

**SHIW coverage of dwelling units**  
(thousands of units and percentages)

Condition of dwellings	Census 1991	Census 2001	SHIW 1991		SHIW 2002	
	Dwelling units	Dwelling units	Dwelling units	Reporting rate	Dwelling units	Reporting rate
Occupied .....	18,104	19,863	15,171	83.8	16,001	80.6
<i>of which: by the owner .....</i>	13,798	15,454	13,745	99.6	14,636	94.7
Not occupied .....	4,855	5,172	1,776	36.6	2,080	40.2
Total.....	22,959	25,035	16,947	73.8	18,081	72.2

Source: Estimates based on SHIW 1991, 2002 and 1991, 2001 Census data.

### 3.2 Housing wealth decomposition: macro versus survey data

An estimate of gross housing wealth (HW) can be obtained by multiplying the average house price (P) by the average surface area (S) and the number of dwellings (N).<sup>26</sup> This calculation has been carried out for 2002 on OMI-CI and Census data (macroeconomic estimates) and SHIW data (microeconomic estimates).

<sup>25</sup> The number of non-occupied dwellings owned by households was estimated by applying at regional level the 1991 proportion to the total number of non-occupied dwellings in 2001.

<sup>26</sup> Housing wealth is corrected so as to include the sales of Government-owned housing to the household sector.



The discrepancy between the two sources can be broken down into its components, considering that the log of the ratio of SHIW to macroeconomic estimates can be expressed as:

$$(hw)^{micro}-(hw)^{macro}=(p^{micro}-p^{macro})+(s^{micro}-s^{macro})+(n^{micro}-n^{macro}) \quad (2)$$

where  $hw=log(HW)$ ,  $p=log(P)$ ,  $s=log(S)$  and  $n=log(N)$ .

The results of this breakdown show that SHIW data are unable to properly estimate the number of dwelling units, while average surface area is overestimated and prices are close to market values (Table 10). As the coverage for occupied dwellings is satisfactory, the weakness of the SHIW is concentrated in the under-reporting and non-reporting of secondary dwellings.

Table 10

**Decomposition of the discrepancies between  
micro and macro estimates of housing wealth, 2002**  
(percentages)

	Average surface	Number of dwellings	House prices	Total difference	Total difference (percentage changes)
	(log-difference)				
North-West .....	12.3	-39.2	-4.1	-31.0	-26.7
North-East.....	12.8	-27.2	10.4	-4.1	-4.0
Centre .....	6.2	-30.2	3.4	-20.6	-18.6
South and Islands.....	14.7	-32.9	16.0	-2.2	-2.2
Italy.....	12.6	-33.0	6.2	-14.2	-13.0

Source: Estimates based on SHIW 2002, 2001 Census data, CRESME and OMI-CI database.

### 3.3 Housing wealth in 1991-2002

The value of dwellings for the years 1991-2002 is estimated as follows. To the 1991 Census-based stock we add an estimate of the newly built dwellings in each year.<sup>27</sup> The resulting stock is then multiplied by the average surface of dwellings and finally appraised using our house price index.

According to macro estimates, in 2002 housing wealth amounted to about 3 trillion euros (an average value of around 143,000 euros per household), 3.6 times households' disposable income. This value, based on a better price estimate, is 23 per cent lower than the one estimated by Brandolini *et al.* (2004).<sup>28</sup>

As indicated by the SHIW, housing wealth was equal to 2.6 trillion euros, 14 per cent lower than the corresponding macro estimate (table 11). Over the years, the ratio of SHIW estimates to macroeconomic figures has increased from 78 per cent (in 1991) to

<sup>27</sup> The number of newly built dwellings is based on estimates from CRESME, an Italian non-profit association for studies on construction industry. This number is multiplied by the share of dwellings owned by natural persons according to 2001 Census data (91.7 per cent of the total) and should include an estimate of illicitly built dwellings. For details see Annex A.

<sup>28</sup> This difference can be accounted for if we consider that in Brandolini *et al.* (2004) 1) the authors used a set of housing price estimates based on a sample of provincial capitals (the original MSZ series corrected with the SHIW ratio of the average value per square metre for all houses to the corresponding value for recently built houses) and 2) instead of the 2001 Census data, they used estimates of the surface areas and number of dwellings based on extrapolation of the 1991 Census.

more than 90 per cent (in 2000). This result is partly due to the decrease in the ratio of secondary dwellings – severely under-reported in the SHIW – to the total number of dwellings.

Table 11

**Housing wealth in Italy, 1991-2002**  
(billions of euros, percentages)

	Housing wealth (macro estimates) (a)	Housing wealth (micro estimates) (b)	Ratio (b)/(a) * 100
1991.....	1,598	1,251	78.3
1992.....	1,865		
1993.....	1,950	1,515	77.7
1994.....	1,952		
1995.....	2,113	1,819	86.1
1996.....	2,232		
1997.....	2,375		
1998.....	2,407	2,023	84.0
1999.....	2,436		
2000.....	2,580	2,395	92.8
2001.....	2,753		
2002.....	3,033	2,604	85.9

Source: Estimates based on the SHIW, OMI-CI database, Istat (Census 1991, 2001) and CRESME. SHIW estimates for the period 1991-2002 are derived from the Historical Archive, vers 4.0.

### 3.4 Housing wealth distribution

In the previous section we have shown that the main shortcoming of the SHIW is the underestimation of secondary dwellings. In this section we evaluate how this under-representation can influence the distribution of housing wealth. To shed light on this issue we compare the survey estimate with adjusted estimates.

Following the adjustment method discussed by Cannari and D'Alessio (1990) and recently applied by Brandolini *et al.* (2004), we correct for the under-reporting of dwellings caused by non-sampling errors. The empirical distribution of the number of houses recorded in the SHIW, excluding those where the household lives, is well approximated by a discrete Poisson distribution, identified by the parameter  $\lambda_d(x)$ , where  $x$  is a vector of household characteristics (including sex, age and squared age of the household head, income, squared income, place of residence, municipality size, household size, home-ownership, annual dummy). Lacking more precise information, we assume that all dwellings not used as principal residence are equally likely to be declared by the owners. The probability that one of these dwellings is declared in the SHIW can then be described by the binomial distribution:

$$\Pr(D = d | S = s) = \binom{s}{d} p^d (1-p)^{(s-d)}, \quad (3)$$

where  $s$  is the number of dwellings owned (excluding the household's residence),  $d \leq s$  is the number of those declared and  $p$  is the proportion of these dwellings recorded in the SHIW. Equation (3) implies that the probability distribution of houses actually owned (excluding the household's residence) is the same as that of declared houses or, more precisely, it is a Poisson distribution with parameter  $\lambda_s(x) = \lambda_d(x)/p$ . By

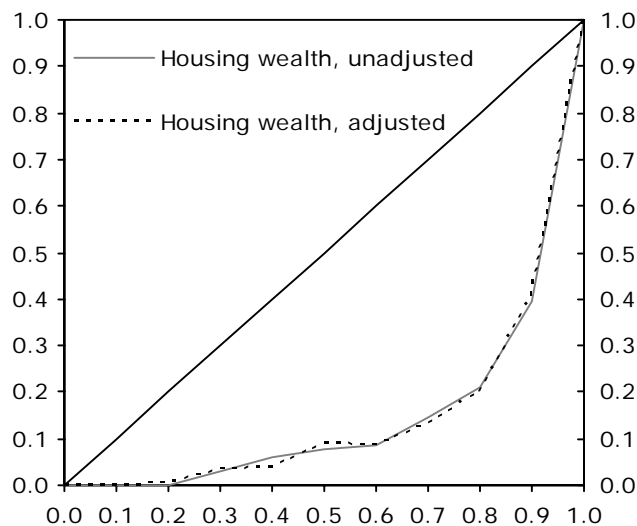
computing  $\Pr(S = s | D = d)$ , it is then possible to impute the ownership of non-reported dwellings. Characteristics and value are assigned by a hot deck method controlling for geographical area and income brackets. For each year, the proportion  $p$  is computed as the ratio of the number of dwellings owned by the households (excluding the household's residence) recorded in the SHIW, after adjustment for non-response, to the corresponding true figure derived from the Census for 2001.

Since in the SHIW respondents are requested to complete a separate sheet for each dwelling they own, failing to report certain assets is a way of reducing the questionnaire burden. The method described above – which can be seen as the equivalent of a proportional adjustment rule for a discrete variable – can account for such non-reporting behaviour, but relies on the crucial assumption that the degree of reticence of respondents is constant across socio-economic characteristics and, in particular, wealth classes. Some indirect evidence that the adjustment works satisfactorily is provided by the similarity of the distributions of rental incomes in the adjusted SHIW data and in tax returns, although it may still slightly underestimate the under-reporting of the richest households.

According to unadjusted data, the Gini index for housing wealth is equal to 0.594, indicating a lower degree of concentration compared with financial assets and total net wealth (that exhibit a Gini index respectively of 0.800 and 0.619). The share of housing wealth held by the top 10 per cent of households is 39.3 per cent. After adjusting data, the Gini index increases to 0.599 (statistically not different from 0.594) and the share of housing wealth held by the top 10 per cent is 40.8: thus the adjustment process leaves the housing wealth distribution basically unchanged (Figure 5).

Figure 5

**Housing wealth concentration: original and adjusted data, 2002**  
(percentages)

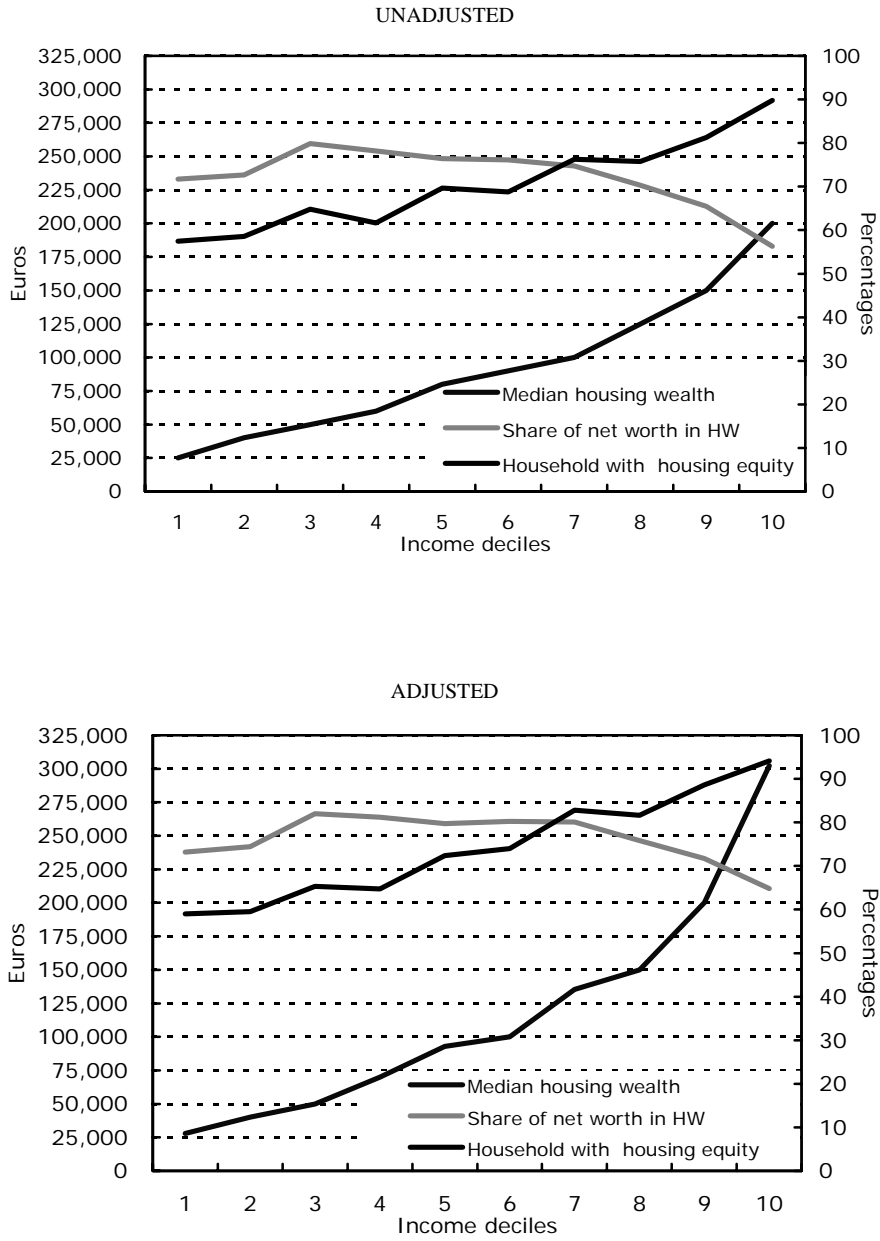


Source: Our calculations based on SHIW.

Looking at the breakdown by income deciles, we see that the share of home-owners increases rapidly with income, while the ratio of housing wealth to total net worth gradually declines after reaching a maximum in the third decile of households. After adjustment, the share of housing wealth and that of home-owners increase, but the profile by income deciles shows minor changes (Figure 6).

Figure 6

**Housing wealth by income decile<sup>(\*)</sup> original and adjusted data, 2002**  
*(euros, percentages)*



(\*) Income from dwellings is excluded.  
 Source: Our calculations based on SHIW.

#### **4. Conclusions**

In Italy there is no official source of information on house prices. Data on this issue are collected by several sources, each of them with its own advantages and disadvantages. Data for a representative but small sample of households are collected by the Bank of Italy's Survey of Household Income and Wealth.

In this paper we present a method for estimating the price per square metre of the average Italian house – resorting to OMI and CI data – and compare the results with the SHIW estimates. According to our findings, the SHIW estimates for 2002 turn out to be very close to market values.

For provincial capitals, the SHIW and CI time series on house prices show a similar pattern. For towns that are not provincial capitals, CI data are not available; SHIW data show a time dynamic that is smoother than the one for provincial capitals, suggesting that house-price dynamics may differ across municipalities of different size. Using the 2002 OMI-CI estimates as a benchmark, the MSZ index for the provincial capitals and SHIW data for towns that are not provincial capitals we compute a new house-price index, more relevant to the estimation of Italian households' housing wealth.

We then compare the SHIW estimates with census data, showing that the survey overestimates the average surface area of houses while it strongly underestimates the number of secondary dwellings. Overall, in 2002 SHIW-based housing wealth was about 14 per cent lower than macroeconomic estimates. The adjustment for under-reporting and non-reporting of dwellings brings about changes in the share of home-owners and the ratio of housing wealth to total net worth; from a qualitative point of view, the profiles of these shares by income deciles show minor changes after adjustment. The Gini index of housing wealth remains almost unchanged.

## APPENDIX

### MEASURING THE ANNUAL HOUSING WEALTH OF ITALIAN HOUSEHOLDS

*Antonio Bassanetti\* and Francesco Zollino\**

#### 1. Introduction

This section illustrates the method used to reconstruct the annual series of the housing wealth of Italian households, including census-based estimates now available for the years 1991 and 2001. Following a comparison of the results of some possible options, it emerges that using the annual flow of new houses onto the market gives the best estimate based on the following criteria:

- compliance with the double bind imposed by the two census-based estimates for the years 1991 and 2001, while maintaining the cyclical variability signalled by other housing market indicators, such as residential investment and house prices;
- consistency between the methods for inter-census interpolation and for projecting all the years after 2001 (until the new census estimates for 2011 are available) with negligible discontinuities for the imputed rates of change in the 1990s and the current decade;
- transparency and ease of access to the basic data.

#### 2. Comparison of alternative methods

Method A, the procedure adopted, is compared with Method B, based on the net stock of residential capital in the national accounts, and with Method C, based on the housing stock recently published by the *Osservatorio del Mercato Immobiliare* (OMI).<sup>29</sup>

##### 2.1 Method A

The annual change in housing wealth is estimated on the basis of the flow of new houses onto the market. More specifically, we use the series calculated by CRESME,<sup>30</sup> publicly available from 1982 and coinciding, from 2005 onwards, with the official series the OMI started to publish.

The method proceeds in two distinct stages, namely interpolation and projection:

- 1) *Interpolation between 1991 and 2001*: taking the census estimate of the dwelling surface area in square metres for 1991, the figure for each successive year is obtained as follows:<sup>31</sup>

$$\begin{aligned} \text{dwelling surface area}_{(t)} &= \\ &= (\text{dwelling unit stock}_{(t-1)} + \text{new houses}_{(t)}) \cdot \text{average size}_{(t)} \end{aligned} \quad (1)$$

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\* Bank of Italy.

<sup>29</sup> The *Osservatorio* is part of the *Agenzia del Territorio* (the Land Agency).

<sup>30</sup> *Centro Ricerche Economiche Sociali di Mercato per l'Edilizia e il territorio*; column A, Table 1.

<sup>31</sup> In equation (1) the estimate of average size is the same as that indicated in the paper (column B, Table 1).

The resulting annual estimates produce a value for 2001 that is 3 per cent higher than the census-based value (see columns D and E, Table 1). To maintain exact equality with the census-based value, we adjusted the estimated annual rates of change according to (1) subtracting the adjustment parameter  $x_i$ , or the gap between the average annual changes of the compared series, calculated as follows:

$$x_i = \left( \frac{K_{i,2001}}{K_{i,1991}} \right)^{1/10} - \left( \frac{K_{census,2001}}{K_{census,1991}} \right)^{1/10} \quad (2)$$

The result is the series given in the first column of Table 2.

Table 1

### Dwelling surface area according to flows of new houses

Year	No. of houses put on the market	Average surface sq. m.	Dwelling surface area (thousand sq. m.)		
			Variation	CR_stock	Pre_stock
	(A)	(B)	(C)	(D)	(E)
1991 .....	251,000	93.30	23,419	<b>2142155</b>	<b>2142155</b>
1992 .....	278,000	93.09	25,879	2168034	2156547
1993 .....	270,536	92.87	25,124	2193159	2171036
1994 .....	281,317	92.65	26,063	2219222	2185623
1995 .....	265,394	92.43	24,529	2243751	2200307
1996 .....	245,727	92.21	22,657	2266409	2215090
1997 .....	222,012	91.99	20,422	2286831	2229972
1998 .....	200,499	91.77	18,399	2305230	2244954
1999 .....	192,848	91.55	17,655	2322885	2260037
2000 .....	198,458	91.33	18,125	2341010	2275221
2001 .....	222,463	91.11	20,269	2361279	<b>2290508</b>
		Percentage change 1991-2001		<b>10.23</b>	<b>6.92</b>
		Adjustment parameter (*)		<b>0.31</b>	
2001 .....	222,463	91.11	20,269	<b>2290508</b>	<b>2290508</b>
2002 .....	242,677	90.89	22,058	2312566	2312906
2003 .....	251,807	90.68	22,833	2335399	2336001
2004 .....	277,815	90.46	25,132	2360530	2359855
2005 .....	296,201	90.25	26,731	2387261	2386695
2006 .....	317,391	90.03	28,575	2415836	2415694
		Percentage change 2001-2006		<b>5.47</b>	<b>5.47</b>

(A) Gross flows of new houses going onto the market; CRESME; since 2005, OMI. (B) Estimates given in the paper. (C) Product (A)\*(B). (D) Upper panel: for each year t different from 1991, sum of (D) at time t-1 and (C) at time t; for 1991 census estimate. Lower panel: as for upper panel for t different from 2001; for 2001, census estimate. (E) Area in sq. m. implicit in the housing wealth estimates provided in the paper, obtained by assuming an annual rate of change equal to the average annual rate between 1991 and 2001; after 2001 equal to the change in the net stock of residential capital in the national accounts. (\*) Identifies the annual adjustment of the rate of change in CR\_Stock ensuring equality with the accumulated change between the two census estimates for 1991 and 2001.

Table 2

<b>Dwelling surface area stock</b>				
	Adjusted CR_ Stock *		Pre_Stock **	
	Level	Percentage change	Level	Percentage change
1991 .....	<b>2142155</b>	-	<b>2142155</b>	-
1992 .....	2161462	0.90	2156547	0.67
1993 .....	2179879	0.85	2171036	0.67
1994 .....	2199096	0.88	2185623	0.67
1995 .....	2216656	0.80	2200307	0.67
1996 .....	2232239	0.70	2215090	0.67
1997 .....	2245504	0.59	2229972	0.67
1998 .....	2256681	0.50	2244954	0.67
1999 .....	2267041	0.46	2260037	0.67
2000 .....	2277774	0.47	2275221	0.67
2001 .....	<b>2290508</b>	0.56	<b>2290508</b>	0.67
Var. 1991-2001 .....		6.93	-	6.93
2001 .....	<b>2290508</b>	-	<b>2290508</b>	-
2002 .....	2305538	0.66	2312906	0.98
2003 .....	2321228	0.68	2336001	1.00
2004 .....	2339086	0.77	2359855	1.02
2005 .....	2358397	0.83	2386695	1.14
2006 .....	2379391	0.89	2415694	1.22
Var. 2001-2006 .....		3.88	-	5.47

\* Estimates adjusted by the parameters used in Table 1. \*\* See column E in Table 1.

- 2) *Projecting for the years after 2001*: taking the census estimate for 2001, the process is the same as 1) above, applying the same adjustment parameter calculated for the period 1991-2001 even for the most recent years, in the absence of any evidence of changes in the previously recorded distortion.<sup>32</sup>

The time series obtained in this way shows that in the mid-1990s there was a temporary slowing down in the accumulation of dwelling surface area, included between the lagged effects of the cyclical peak preceding the 1992 crisis and the beginning of the new expansionary phase towards the end of the decade.

Compared with the linear trend that can be taken as a first attempt at interpolating between the two census estimates over the 1990s the series based on flows of new houses has the advantage, for example, of enhancing the informative content of the wealth estimate in interpreting households' consumption behaviour.

<sup>32</sup> Estimates obtained in this way show a lower rate of change than that calculated on the basis of the stock of residential capital in the national accounts (Table 1, lower panel).



## 2.2 Method B

The annual variation in dwelling surface area is taken as equal to the change in the net stock of residential capital estimated in the national accounts, duly deflated. The choice of deflator is important given that the deflator for chain-linked prices of residential investments, according to the national accounts, follows a different trend from that of the market prices for houses.<sup>33</sup>

Table 3

### Dwelling surface area according to the national accounts stock of residential capital

	Residential capital stock and house prices (percentage change)				Dwelling surface stock (level in thousand sq. m.)			Adjusted dwelling surface stock (level in thousand sq. m.)			
	stock at substitution prices	Istat	C-F	MSZ	based on			Pre_Stock	based on		
		deflator	prices	prices	(A) / (B)	(A) / (C)	(A) / (D)		(A) / (B)	(A) / (C)	(A) / (D)
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(L)	(M)
1991...	10.27	8.18	20.75	13.86	<b>2142155</b>	<b>2142155</b>	<b>2142155</b>	<b>2142155</b>	<b>2142155</b>	<b>2142155</b>	<b>2142155</b>
1992...	7.00	5.00	15.12	19.63	2182930	1991091	1915989	2156547	2165391	2006626	1894537
1993...	4.53	2.73	3.25	2.45	2221080	2015619	1954751	2171036	2185506	2045898	1913894
1994...	5.21	3.55	-1.20	-7.20	2256813	2146326	2216284	2185623	2202773	2193406	2150794
1995...	3.56	1.97	6.93	2.07	2292090	2078667	2248688	2200307	2219171	2140169	2160703
1996...	3.99	2.51	4.42	-0.27	2325182	2070072	2344812	2215090	2233041	2146841	2231428
1997...	3.79	2.46	5.32	2.44	2355399	2040026	2375777	2229972	2243778	2131250	2238550
1998...	2.70	1.47	0.37	-2.05	2384027	2087383	2491150	2244954	2252678	2196181	2324842
1999...	2.89	1.67	0.28	-1.00	2412708	2141742	2589042	2260037	2261335	2269300	2392918
2000...	5.95	4.63	4.93	6.08	2443231	2162655	2585976	2275221	2271429	2307916	2366121
2001...	3.60	2.32	5.58	6.37	2473767	2122051	2518672	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>
		Percentage. change 2001-1991			15.48	-0.94	17.58	<b>6.92</b>	<b>6.92</b>	<b>6.92</b>	<b>6.92</b>
		Adjustment parameter *			0.82	-0.72	1.01				
2001...	3.60	2.32	5.58	6.37	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>	<b>2290508</b>
2002...	5.35	4.08	8.98	13.67	2309035	2205264	2114258	2312906	2290358	2221808	2091414
2003...	4.19	2.92	8.54	13.01	2337665	2116973	1949212	2336001	2300005	2148968	1907208
2004...	5.52	4.20	6.26	11.89	2367182	2102320	1838273	2359855	2310215	2149678	1779560
2005...	5.47	4.04	7.28	8.04	2399827	2066928	1794490	2386695	2323160	2129078	1719355
2006...	4.62	3.12	6.54	7.90	2434793	2030474	1740003	2415694	2337988	2106969	1649932
		Percentage. change 2006-2001			6.30	-11.35	-24.03	5.47	2.07	-8.01	-27.97

(A) Net stock of residential capital at substitution prices in the national accounts. (B) Chain-linked prices in the national accounts. (C) House prices given in the paper. (D) House prices in Muzzicato, Sabbatini and Zollino (2002). (E) For each year different from 1991 in the upper panel and each year different from 2001 in the lower panel, estimates based on the variation in net stock of residential capital deflated with chain-linked prices in the national accounts; census estimates for 1991 in the first panel and for 2001 in the second. (F) and (G) as in column (E), using the prices given in the paper and those given by Muzzicato, Sabbatini and Zollino (2002) respectively as the deflator. (H) See column E in Table 1. (I), (L) and (M) adjusted estimates of the stock given in (E), (F) and (G), respectively, on the basis of the corresponding adjustment parameter. (\*): calculated according to formula (2) in the text.

<sup>33</sup> The size of the gap varies with the state of the housing cycle (columns B-D, Table 3).

Also in this case, a two-stage procedure is considered:

- 1) *interpolation between 1991 and 2001*: taking the 1991 census-based estimate of dwelling surface area, for the following years we apply a rate of change equal to that for the net stock of residential capital published by Istat, deflated using three different prices (columns E-G, Table 3): i) the official deflator at chain-linked prices as in the national accounts; ii) the house prices covering the whole country presented in the paper; iii) house prices covering only the provincial capitals given in Muzzicato, Sabbatini and Zollino (MSZ; 2002).<sup>34</sup>

Whichever alternative is chosen for the deflator, the overall variation between 1991 and 2001 in total dwelling surface area, estimated in this way, is significantly different from the value inferred from the census data. For this reason, as in Method A, it is necessary to apply an adjustment parameter calculated according to (2), which for any of the three options under consideration here will be relatively high in terms of absolute values. The corresponding adjusted series show, in some years, negative changes where the Istat deflator is not applied (see columns L and M, Table 3). Since the result does not seem consistent with the trend for new housing, it is reasonable to reject both options based on market prices.<sup>35</sup>

- 2) *Projecting for the years after 2001*: for consistency with the indications given in the previous stage, a rate of change equal to that of the net stock in the national accounts at chain-linked prices is imputed, to which the usual adjustment coefficient is then applied.

The series obtained in this way is more variable than that given by Method A, probably in line with the marked amplitude of the cycle indicated by the house prices and by residential investment. However, against the choice of this method, significant adjustment must be made in order to respect the double bind coming from the two census-based estimates, with the indirect effect of depressing the rate of increase over the current decade, if compared with the results of Method A.

### 2.3 Method C

The OMI annual report gives an estimate of the stock of dwelling units based on the electronic database of the land registry. This database, which has only been updated since 2000, contains information on: i) the flow of new buildings; ii) changes in the subdivision and use of existing buildings; iii) new entries following the conversion of the backlog of data still recorded in paper files. In terms of method, the OMI series evaluates the stock of dwelling units at the end of every first semester and the corresponding flow includes all the changes that have taken place in the twelve months up to June in the reference year. Given the short time coverage, for our purposes the use of these data can only be evaluated in terms of projecting the census estimates for the years after 2001.

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<sup>34</sup> Muzzicato S., Sabbatini R. e Zollino F. (2002) *I prezzi delle abitazioni in Italia: una rassegna dei temi metodologici e la costruzione di un nuovo indice*, mimeo, Banca d'Italia.

<sup>35</sup> The inconsistency is due to the double bind of the census estimates for 1991 and 2001; in the old wealth estimates calculated by the Bank of Italy only one benchmark was adopted and the use of market prices did not produce anomalous results.

From an operational point of view, the series of the stock of dwelling units is first reduced by the share of property owned in sectors other than households (column A, Table 4), and then expressed in square metres on the basis of the average size used in Method A. This produces a series of the dwelling surface area which is greater, and increasingly so over time, than that inferred from the rate of change in the stock of residential capital in the national accounts. Equalizing the two series in 2001, for the following years the estimated values according to OMI data are greater, by almost 2 per cent in 2006 (columns B and D, Table 4).

Table 4

**Dwelling surface area according to OMI stock of dwelling units**

	No. of dwelling units (OMI)	Dwelling surface stock			
		OMI		Pre_Stock	
		thousand sq. m.	var.	thousand sq. m.	var.
	(A)	(B)	(C)	(D)	(E)
2001 .....	25551300	<b>2290508</b>	-	<b>2290508</b>	-
2002 .....	25977519	2323162	1.43	2312906	0.98
2003 .....	26421604	2357242	1.47	2336001	1.00
2004 .....	26857660	2390432	1.41	2359855	1.02
2005 .....	27300171	2424023	1.41	2386695	1.14
2006 .....	27840317	2466088	1.74	2415694	1.22
Var. 2006-2001		7.67		5.47	

(A) Number of residential buildings owned by households (91.7% of the total). (B) Product of (A) and the average size in sq. m., linked to the census surface area estimate for 2001. (D) See column E, Table 1.

The series reconstructed using Method C has the advantage of regularly incorporating land registry data and it is accessible to the public. On the other hand, it has the drawback of recording very broad annual variations, on average equal to almost double the flow of new buildings. According to the available information, about 2 per cent of the extra changes is on average due to a backlog in converting data still in paper files, while the rest is largely attributable to the subdivision of existing units.

Besides any doubts concerning the quality of the land registration data at the present state of the electronic database, it is probable that such an intensive process of subdivision will lead to a reduction in the actual size of dwelling units in relation to the estimates available from the different sources (see data given in the paper and by Cresme). In the absence of information allowing us to update this data correctly, it is likely that Method C will overestimate dwelling surface area.

### 3. The choice of method

After comparing the various options it was decided to use Method A. Apart from the advantages described earlier, the resulting yearly rate of increase in dwelling units is very close to that of residential investment in the national accounts, net of the expenditure on extraordinary maintenance (which does not basically alter the dwelling stock; Figure 1).

Figure 1

**Residential investment and new houses put on the market**

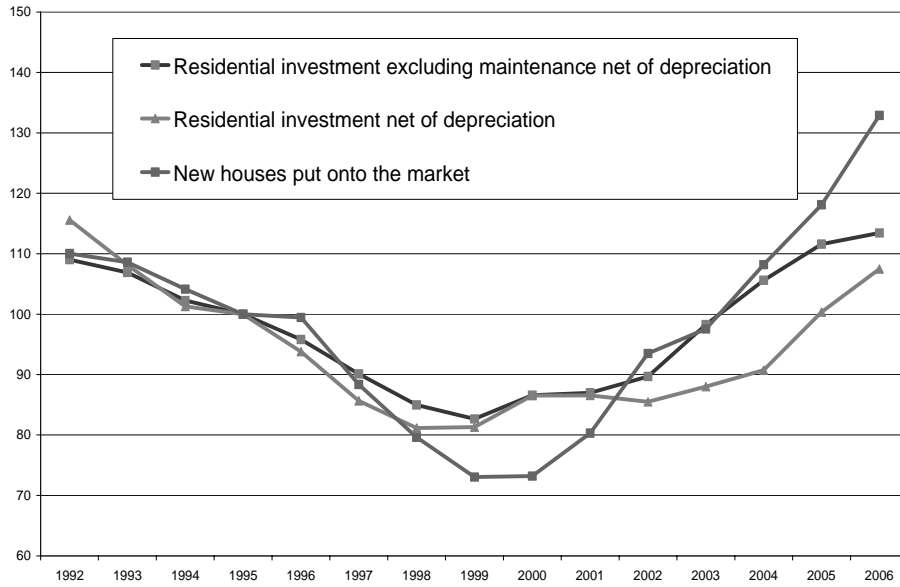
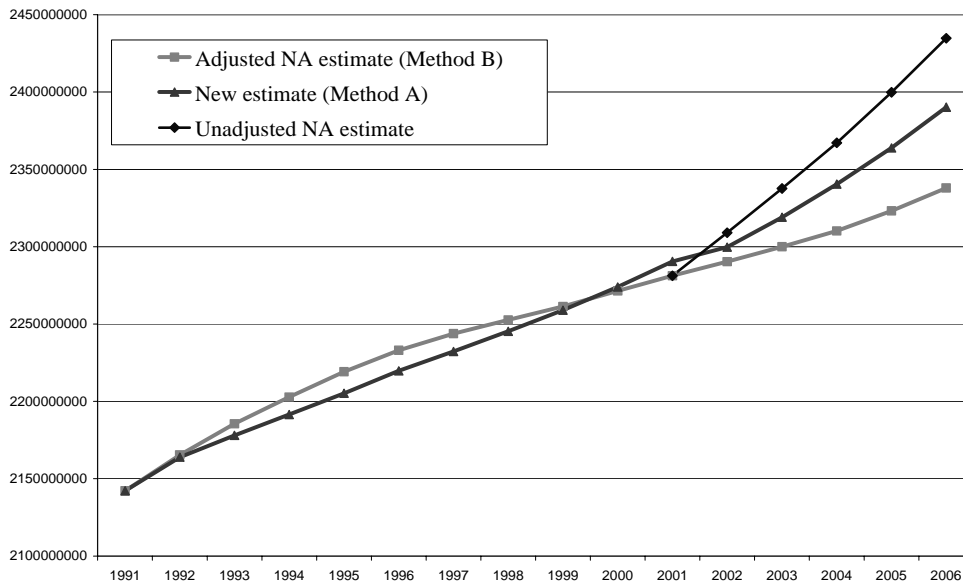


Figure 2

**Dwelling surface area in square metres**



As for the dwelling surface area for the current decade, our estimate offers the closest approximation, in terms of level and change, to the estimate based on the rate of increase in the net stock of residential capital in the national accounts, and plausibly adjusts for the expected overestimation implicit in the latter.<sup>36</sup>

The method adopted does not produce large discontinuities between the rate of change in the current decade and the rate imputed throughout the 1990s in compliance with the requirement of a 6.9 per cent cumulative increase measured on the basis of the two census estimates (see Figure 2).

A further advantage is the simplicity of calculation and ease of access to the information used. The annual estimates of dwelling surface area remain virtually unchanged if, instead of using the adjustment parameter proposed here in order to compare the methods, the flow of new housing is reduced by the share of property owned by sectors other than households (equal to 8.3 per cent in the 2001 Census). This variant of Method A is used in the estimates presented in the paper in order to improve the transparency of the methodology and of the data employed.

A last point to be made concerns the comparison with the estimates of housing wealth previously computed by the Economic Research Department of the Bank of Italy, which have been used sometimes in the updates to the Annual Report and which have been sent to the OECD since 1998. They were obtained using the permanent inventory method based on changes in the net stock of residential capital, deflated by house prices in the provincial capitals (MSZ) and anchored to a benchmark calculated for *one year only* (1991 in the latest figures).

Table 5

**Consumer households - Link between the old and new estimates of housing wealth**

	Old Series (OS)	OS at new prices	OS at new prices and benchmark	OS at new prices benchmark and rate of change
	(A)	(B)	(C)	(D)
2001 .....	3771723	2594883	2730285	2730285
2002 .....	4140151	2730809	2873305	2994558
2003 .....	4428713	2805429	2951817	3272070
2004 .....	5161085	3104775	3266784	3502993
2005 .....	5370074	3207554	3374926	3788209
	(D)-(A)	(B)-(A)	(C)-(B)	(D)-(C)
2005* .....	-1581865	-2162520	167372	413283
2005** .....	100	-136.7	10.6	26.1

\* Differences in levels. \*\* Percentage of total difference between old series (A) and new series (D).

<sup>36</sup> In the national accounts the stock of housing wealth is estimated using the permanent inventory method based on the flow of residential investment, half of which consists of extraordinary maintenance. However, this should affect only market evaluations, and not dwelling surface area. Moreover, the deflator used in the national accounts is based on production costs, which have risen at a much slower pace than the market house prices in the recent expansionary phase.

Estimating dwelling surface area by Method A and applying the new price measures referred to in the paper produces an annual series of housing wealth that is substantially lower in the more recent period (columns A and D of Table 5).<sup>37</sup> In particular, in 2005 the new measure was almost 30 per cent lower than the previous one, simply because house prices throughout the country were much lower than those in just the provincial capitals (by about €1000 per square metre).

As a ratio of consumer households' disposable income, the new value of housing wealth was 3.9 per cent in 2005, some 1.6 percentage points lower than with the old method. As the paper demonstrates for total households, also for consumer households the decline in the housing component of wealth is the main determinant of the downward revision in total wealth in the new estimates.

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<sup>37</sup> The series in column D is the one presented in the paper.

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## THE REAL ASSETS OF ITALIAN HOUSEHOLDS

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### 1. Introduction

No official macroeconomic data are available in Italy on the value of real assets held by Italian households (or by the other institutional sectors). Unofficial estimates of several components of households' real wealth have been produced in the past by Tresoldi and Visco (1975), Pagliano and Rossi (1992), and more recently by Brandolini *et al.* (2004). The latter focuses exclusively on consumer households and therefore does not consider several wealth components linked to the entrepreneurial activities of producer households (sole proprietorships, informal partnerships and companies with up to five employees).<sup>1</sup>

In a country like Italy, where small firms are prevalent, these components can account for a significant proportion of total wealth. According to the most recent Survey on household wealth and income (SHIW) conducted by the Bank of Italy, in 2004 business wealth accounted for almost 10 per cent of households' real assets (and as much as one third of total real assets for entrepreneurs and the self-employed).

This paper differs from previous macroeconomic estimates of real wealth by introducing an assessment of wealth components that refer to the producer household sector. These estimates are then compared with those reported in the SHIW. Though the literature offers studies on the quality of the SHIW data,<sup>2</sup> this paper provides the first analysis of the quality of sample data relative to the wealth components of producer families.

Turning to the comparison of micro and macro estimates, it should be remembered that the definitions adopted in the survey are not easily reconciled with those of the national accounts. Several sub-aggregates of wealth will accordingly be redefined to make the definitions comparable with the macroeconomic estimates. The results of the Survey of Household Income and Wealth presented here may therefore differ from those published by the Bank of Italy.

The paper is organized as follows. Section 2 presents the results of the macroeconomic estimates of the components of real wealth. Section 3 compares these with the appropriately reclassified SHIW data. Section 4 presents our main conclusions.

### 2. Households' real assets

As noted in the introduction, there are no official estimates of households' real assets in Italy. This section illustrates the method used to reconstruct these wealth components, which will then be compared with the SHIW data.

The estimates are based on the definitions used in the national accounts, in other words the ESA95 standard.

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\* Bank of Italy. Our thanks to Romina Gambacorta and Alessandra Agostinelli for their helpful comments.

<sup>1</sup> See Dabbicco (2003).

<sup>2</sup> See Brandolini and Cannari (1994), Brandolini (1999), Cannari and D'Alessio (1990; 1992; 1993).

*The definition of “households”* – The ESA95 sector classification system rests on the concept of institutional unit.<sup>3</sup> The institutional units are grouped into homogeneous sets, called institutional sectors. The Households’ Sector comprises individuals or groups of individuals in their capacity as consumers or possible producers. Accordingly, this sector includes informal partnerships, de facto companies and sole proprietorships, whose primary function is to produce non-financial goods and services for the market, with up to five employees (sub-sector: Producer Households). The upper limit of five employees to distinguish producer households from quasi-corporations is not imposed by ESA95; Istat chose to adopt it as a working criteria, clearly a decision that was in line with the general principles of ESA95 (Dabbicco, 2003).<sup>4</sup> Finally, this sector includes non-profit institutions serving households. This is primarily because: first, households are ultimately the beneficiaries of the goods and services offered to them at particularly advantageous conditions by the non-profit institutions; and second, because of this their social/non-profit function and economic behaviour can be easily assimilated with that of the households themselves.

*The components of real assets* – Based on the indications of ESA95, the values of assets held and outstanding liabilities must be calculated at current market prices. Table A1 presents the breakdown of the instruments. Economic assets are divided into two major aggregates: non-financial assets (AN), corresponding to real assets; and financial assets. Real assets in turn are subdivided into non-financial produced assets (AN.1) and non-financial non-produced assets (AN.2). Non-financial produced assets comprise: fixed assets (AN.11), inventories (AN.12) and valuables (AN.13). Non financial non-produced assets comprise: tangible non-produced assets (AN.21), for example lands and subsoil assets, and intangible non-produced assets (AN.22), such as patents and business goodwill.<sup>5</sup>

It follows that the real assets of households, which we propose to estimate (whenever the Households Sector is defined as above), comprises the following items: dwellings, valuables, plant, machinery and equipment, inventories and goodwill, and lands.

## 2.1 Dwellings

Estimates of the residential property holdings of households in any given year comprise three elements: a) the price of dwellings per square meter representing the households’ stock of dwellings; b) the number of dwellings held; c) and, the average floor area of the dwellings in square meters. The estimate of residential dwellings wealth for a given year will therefore be obtained by multiplying these three elements.

<sup>3</sup> ESA95 considers the following institutional units: a) public and private corporations; b) co-operatives or partnerships recognized as independent legal entities; c) households, deemed to be institutional units even if they do not keep a complete set of accounts; d) notional resident units, even if they keep only partial accounts and may not always enjoy autonomy of decision; e) public producers which by virtue of special legislation are recognized as independent legal entities; f) non-profit institutions recognized as independent legal entities; g) agencies of general government; h) quasi-corporations, that is, entities not having independent legal status that keep a complete set of accounts and by convention are deemed to have autonomy of decision inasmuch as their economic and financial behaviour is distinguished from that of the owners.

<sup>4</sup> The classification criteria used for the institutional sectors interact with the accounting scheme for assets and liabilities. As Bonci *et al.* (2007) demonstrate, the composition of household wealth depends on the operative criteria used for the statistical breakdown between producer households and quasi-corporations: raising the threshold (currently 5 employees) beyond which sole proprietorships, informal partnerships and de facto partnerships are classified as quasi-corporations would increase the share of households’ real assets; lowering it would increase the share of financial assets.

<sup>5</sup> Financial assets are subdivided into: monetary gold and SDRs (AF.1); currency and deposits (AF.2); securities other than shares (AF.3); loans (AF.4); shares and other equities (AF.5); insurance technical reserves (AF.6); other accounts payable and receivable (AF.7).

- a) The price estimate is based on the methodology proposed by Cannari and Faiella (in this volume). The benchmark index is established by means of a composite estimator that uses data from the Italian Property Observatory (OMI) of the Ministry of Finances and the twice-yearly survey of real estate agents published by Italian media group *Il Sole 24 Ore*, the “Consulente Immobiliare”, extrapolated to the whole universe of Italian municipalities.
- b) The number of dwellings is based on the Census data on the stock of houses owned by natural persons in 1991. This stock is updated for subsequent years based on data on new buildings (again owned by natural persons).<sup>6</sup> CRESME data, that includes an estimate of illicitly built dwellings, are used up to 2004, and subsequent years employ data provided by the Property Market Observatory.<sup>7</sup> The estimate excludes the value of buildings owned abroad by Italian households and buildings owned in Italy by non-resident households.
- c) The average floor area of occupied dwellings is taken from the Census data for 1991 and 2001 and is estimated based on the data trends for subsequent years.

Housing wealth is corrected so as to include the sales of Government-owned housing to the household sector.

Following this methodology the dwelling stock of Italian households in 2005 is estimated at €3,887 billion, equal to almost 80 per cent of total real assets (Table A3).

## 2.2 Valuables

Valuables are non-financial goods that do not deteriorate over time under normal conditions and that are acquired and held primarily as stores of value. They consist of precious metals and stones, non-monetary gold, antiques, and art and other objects belonging to households (Siesto, 1996). Their value is obtained by applying an estimator given by the ratio between the valuables and the stock of durable goods owned by households based on SHIW data.<sup>8</sup> This ratio is then applied to the estimated stock of durable goods based on the method developed by Pagliano and Rossi (1992).<sup>9</sup>

The stock of valuables estimated in this way amounted to €134 billion in 2005 (Table A3).

## 2.3 Non-residential buildings

This category comprises the market value of the stock of property owned by households and set aside for working purposes, including offices, shops/workshops and warehouses. The total value of the stock held by producer households was obtained by multiplying the estimates of the following components: (1) average price per square meter, (2) average floor area, and (3) the total number of buildings. The prices, computed as the average value of minimum and maximum prices per square meter reported at

<sup>6</sup> The stock of dwellings estimated in this way is in line with the number of dwellings reported in the 2001 Census.

<sup>7</sup> Rapporto sulle nuove costruzioni nel 2005. Available online ([www.agenziaterritorio.it/servizi/osservatorioimmobiliare/rapporto\\_costruzioni](http://www.agenziaterritorio.it/servizi/osservatorioimmobiliare/rapporto_costruzioni)).

<sup>8</sup> The ratio is calculated after having Winsorized the numerator and denominator, using as threshold values the 1<sup>st</sup> and 99<sup>th</sup> percentile of their distribution.

<sup>9</sup> The stock of durable goods is computed by applying the perpetual inventory method to reconstructed series for the expenditure at constant prices on four different categories of durables, assuming exponential depreciation and retirement of the goods after a fixed number of years (20 years for furniture and furnishings, and 10 years for household equipment, transport, and TV, HI-FI and computer equipment). As standard in national accounts, the current values of the stock are expressed at substitution prices by multiplying the series at constant prices by the deflator of the corresponding expenditure.

municipal level for each category of building, and the units are based on data from the Property Market Observatory,<sup>10</sup> while area estimates were based on data from the 2004 Survey of Household Income and Wealth. The data available permit a time series to be constructed from 2002 onwards only; for previous years, the value of non-residential buildings is obtained by calculating their proportion of the overall value of dwellings and lands. Equal to about 7 per cent, this proportion remains unchanged in the period 2002-2005 and is in line with the SHIW estimates.

In 2005, the value of non-residential buildings based on the estimates used amounted to €312 billion, equal to one third of the total stock of real assets of producer families (Table A3).

#### 2.4 Machinery and equipment

Fixed capital goods, excluding non-residential buildings, comprise machinery and equipment, transport equipment, computer software and other intangible assets owned by producer households. The reconstruction takes data on investments in this sector as the starting point.<sup>11</sup> First, an initial value of the net capital stock of producer households at current prices is estimated for 1990, the base year. Producer household investments are then added to this value and depreciation subtracted, calculated by Istat at current prices for producer households and deflated using the National Accounts implicit deflators of fixed investment and of depreciation.<sup>12</sup> In this way an estimate is obtained of the stock of net capital at constant prices for the producer household sector in each of the years considered. The net capital stock series at substitution prices is then reconstructed using the relevant deflators calculated by Istat for the whole economy.

The following method is adopted to calculate the initial value of net fixed capital assets (in machinery and equipment) in the base year (1990): first, the ratio between producer households' investments and the overall amount of investment other than in building is computed; the mean of this ratio, calculated for the 1980s, gives an indication of producer households' share of total investment in the economy (excluding investment in building). This weighting is then applied to the stock of net fixed assets calculated by Istat for the economic system as a whole (excluding building).

This method relies on an arbitrary assumption but we have two reasons to believe that the estimate obtained in this way for the base year (1990) is sufficiently reliable: first of all, throughout the 1980s the share of producer household investment in total investment (excluding buildings) varied only modestly (fluctuating at around 16 per cent), so that the investment behaviour of producer households was not very dissimilar to that of the entire economic system; secondly, we think it's plausible that the exclusion of buildings aligns producer household investment portfolios more closely with those of the other productive sectors. In any event, from 1990 onwards the capital stock of producer households is reconstructed by adding investment (and subtracting depreciation) as calculated by Istat for that specific sector to the initial value of the capital stock; for this

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<sup>10</sup> The number of non-residential buildings owned by producer households is estimated applying the transaction's share made by natural persons to the different categories of buildings.

<sup>11</sup> The estimates are based on the July 2007 National Accounts.

<sup>12</sup> In 2006 Istat presented a methodological review of the series of fixed investments by ownership branch, capital stock and depreciation. The new data are the result of the general review of the national accounts undertaken in accordance with EU rules, (see *Bollettino Economico*, No. 46, March 2006: "Revisione delle metodologie di calcolo dei conti nazionali nell'Unione europea"; and, "La revisione delle serie degli investimenti fissi per branca proprietaria, dello stock di capitale e degli ammortamenti"). One consequence of this review was the introduction of chained price indexes to substitute fixed base indexes (taking 1995 as the base year). Given that the new indexes do not allow the quantities to be added at constant prices (additive properties), we have used indexes that retain this property.

reason the quality of the estimates tends to improve as the end of the reference period is approached.

The results, listed in Table A3, show that in 2005 the value of machinery and equipment came to €229 billion, equal to 5 per cent of all real assets.

## 2.5 Inventories and goodwill

The value of the stock of inventories relative to the entire economic system is obtained using a benchmark provided by Istat with reference to 1989, and adding, for each year, the variation in inventories at constant prices contained in the national accounts.<sup>13</sup> The data at constant prices were later converted to current prices using the GDP deflator.

The share of inventories attributable to the producer households was calculated based on the ratio of output at base prices of producer households to that of all non-financial enterprises (non-financial companies plus producer households), assuming that the size of the inventories is commensurate with the volume of production. In the 1990s this ratio averaged 21 per cent.

The goodwill estimate is based on data from the Cerved for smaller-sized companies, i.e. those with turnover below a certain threshold. The turnover threshold was chosen rather than number of employees because the latter is often not present in the Cerved data, while the turnover (given that this is accounting data) is always reported. For each year, the threshold was predetermined based on the average turnover per employee that emerges from the Istat surveys of profit-and-loss accounts of small-sized enterprises (up to 9 employees). For example, in 2002, this average was approximately €4,000, so we felt that enterprises with a turnover of less than €470,000 could constitute a reasonable proxy of those with up to 5 employees. Using this Cerved survey subset the average ratio of goodwill to fixed assets was estimated for the period 1995-2002.<sup>14</sup> This proportion, equal to 9 per cent, was then applied to the stock of capital goods reconstructed according to the national accounts data.

The method used has two main limitations: first, the Cerved data refer to private and public companies and public corporations only, so extending the goodwill and tangible fixed asset ratio to producer households is certainly arbitrary. Second, balance-sheet tangible assets are carried at cost less depreciation, so the application of this ratio to the value of capital stock in the national accounts is likely to produce an overestimation of goodwill. Indicating the order of magnitude by share of goodwill in gross tangible fixed assets (in other words before depreciation), revalued to take account of price changes, one gets an estimate of 5.5 per cent (1999).<sup>15</sup> Applying this percentage to the data on the fixed capital goods stock in the national accounts should lead to an underestimate of the value of goodwill, because the revalued gross fixed assets do not take account of capital depreciation.

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<sup>13</sup> As recalled earlier, chained price indexes do not allow quantities to be added at constant prices (additive properties). Accordingly, the variation series of the inventories at constant prices which, prior to the 2006 review, was calculated as a residual, is now no longer available. The GDP deflator was used to deflate the series at current prices.

<sup>14</sup> The estimate was made in two stages. First, the Company Accounts Data Service was used to calculate the share of goodwill in total intangible assets by class of intangible asset investment; then the estimates were applied to the Cerved data to estimate the total value of goodwill.

<sup>15</sup> This assessment is possible only for the reconstructed data of the Company Accounts Data Service for a sample of medium-sized and large industrial accounting units. For this sample, the ratio of intangible to tangible fixed assets valued at cost net of depreciation is 13 per cent, basically equivalent to that measured using the Cerved data.

By this method, inventories in 2005 were estimated at €89 billion and goodwill at €48 billion (Table A3).

## 2.6 Lands

The total value of lands is calculated as the sum of the value of agricultural lands and lands set aside for other purposes. The value of lands used for agriculture is based on the overall amount of agricultural lands per region drawn from the annual survey of the property market compiled by the National Institute of Agricultural Economics (INEA).<sup>16</sup> To evaluate non-agricultural lands, their value as a percentage of the value of agricultural lands in the SHIW estimates was applied to the foregoing estimate (in the period 1991-2004, this percentage averaged around 11 per cent). The value thus obtained was used to estimate the share of producer households only,<sup>17</sup> applying the percentage of farm area that they use according to the latest agricultural Census. This share, equal to 80.4 per cent, was assumed to be valid also for non-agricultural land area and to be substantially stable over time.

In 2005, the value of the lands amounted to €237 billion, equal to approximately 5 per cent of all real assets (Table A3).

## 3. Micro and macro estimates: the principal conceptual differences

Before proceeding to compare micro and macro estimates it must be remembered that the national accounts and the Survey of Household Income and Wealth (SHIW) respond to different aims, principles and criteria. In the national accounts, for example, the need to distinguish between the consumption and production functions leads to a subdivision between “consumer” and “producer” households; from this requirement there follows an operational criteria based upon the legal form and the number of producer employees of households’ businesses. In a microeconomic study this distinction can be made for survey items (for example sources of income), but it is not suitable for classifying households as such (the same household can perform both the consumer and producer functions); what is more, some items that serve to reconcile the consumer household sector with that of producer households (e.g. the share of mixed income transferred from producer households to consumer households) or that of quasi-corporations (income deriving from the members of quasi-corporations) are based upon operational (and in some respects conventional) criteria that are hard to use in a research study.

The survey, moreover, tries to distinguish assets in respect of which the household plays an active managing or controlling role from assets that merely make up an investment portfolio, whereas the financial accounts distinguish only between types of financial instrument. In other words, for the purposes of the survey it does not matter whether a household business in which the head and spouse work is a *de facto* company or a private limited company, what matters is the value of the asset (and the income that flows from it). But for the financial accounts these are two different forms of wealth.

It should also be noted that, while ESA95 includes not-for-profit organizations in the definition of the household sector, in a sample survey it would not make sense to give

<sup>16</sup> The survey results are available online at: [www.inea.it/progetti/mercato\\_f.cfm](http://www.inea.it/progetti/mercato_f.cfm).

<sup>17</sup> The general census on agriculture provides data on the farm area used according to the owner’s legal form. The producer household sector was reconstructed taking into account sole proprietorships, agricultural associations and joint leases and some informal partnerships.

them the same questionnaire as that designed for the households.

As to methodology, the comparison between survey data and macroeconomic data requires us to examine two issues: (i) the definition of the field of observation, and (ii) the definition of each asset.

### 3.1 *The field of observation*

The SHIW has been conducted by the Bank of Italy since 1962, with the objective of acquiring a deeper insight into the economic behaviour of households. The reference population for the study consists of households listed in the civic register of residents, excluding persons who reside in institutionalized settings (such as hospitals, rest homes, prisons or military buildings). The sample, equal in the last study to about eight thousand households, is chosen using a two-stage<sup>18</sup> sample design, where the first-stage units (municipalities) are stratified to take account of population distribution and by city size in terms of population.

There is no great difficulty in reclassifying the survey data by distinguishing between households and quasi-corporations based on the number of employees and the legal form, as happens in the national accounts. This information is in fact gathered for households that carry on a productive activity and for persons who manage companies. The principal differences between the survey and the macroeconomic estimates, as far as the definition of the households sector is concerned, are therefore two: the inclusion, in the household sector of macroeconomic accounts of non-profit institutions serving households, which are excluded from the SHIW; and the survey's exclusion of the population resident in institutions, which are included, at least in principle, in the macroeconomic estimates.

The first problem can be overcome by separating out the non-profit institutions.<sup>19</sup> The problem of the population resident in institutions is insoluble but the impact of its exclusion from the total population is modest (of the order of 0.7 per cent according to census data), so the comparison can be made on a relatively homogeneous basis.

### 3.2 *The components of real wealth*

In the survey the real wealth of the household is given by the sum of property – i.e. dwellings, non-residential buildings and land – valuables and “wealth in businesses”. The components are generally valued at realizable prices, estimated subjectively by the interviewee.<sup>20</sup>

In the SHIW, “wealth in businesses”, of which there is no direct equivalent in ESA95, is given by the sum of three components:

- 1) the value of the businesses of professionals, sole proprietors and self-employed workers, discovered by the question “How much do you believe your business would be worth if you were to sell it, ceasing to be involved in the business,

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<sup>18</sup> Starting with the 1989 study a part of the sample (around 50 per cent in the last few surveys) has consisted of households that had already participated in surveys (panel households), making it possible to study the evolution of such phenomena such as mobility of households between income or different employment statuses.

<sup>19</sup> This strategy was adopted for the financial accounts by Bonci, Marchese and Neri (2005).

<sup>20</sup> For financial assets the questionnaire does not specify the criteria of valuation: while for shares, investment funds and other listed assets respondents presumably reported market prices for the year end in question, some instruments (government securities for example) are more likely to be given at face value (see Bonci, Marchese and Neri, 2005).

counting the equipment used in the activity, inventory and goodwill but not the value of the buildings used?";<sup>21</sup>

- 2) the value of the businesses of the household, drawn from a question similar to the one above;
- 3) the value of equity in partnerships and companies, where the household member has a managing or controlling role. In this case the value taken is the answer to the question "What is the market value of your share of the partnership/company?".

There is an important difference between the first two components and the third: in the former the value of the business is calculated with direct reference to the tangible assets (capital assets and inventory) and intangible assets (goodwill) of which it is constituted; in the latter the value is indirect, in that, one refers to a financial asset that itself represents the value of the business (an equity holding).

In principle this distinction is consistent with the representation of economic assets typical of the system of national accounts, which is founded upon the concept of institutional units and their grouping into "sectors of activity". According to these principles, a business that is not identifiable as an institutional unit separate from its possessor<sup>22</sup> – in our case a person classified in the household sector – cannot be considered as an equity asset of the proprietor. But the company's tangible and intangible assets will appear as assets of the proprietor. This is the case of components 1 and 2 of the "wealth in businesses" according to the survey's taxonomy. In the proprietor's balance sheet these components are added to his other assets, irrespective of his role as "producer"; similarly no distinction is made between the liabilities he has incurred to operate the business and others that he may have contracted, for example in his role as consumer.

A business that can be identified as an institutional unit separate from the household that owns it will instead be classified in the national accounts under "corporations and quasi-corporations". Since the two institutional units belong to different sectors, transactions between them will be recorded in the sectoral accounts and the interests in the capital of the business will be shown among the balance-sheet liabilities of the "corporations and quasi-corporations" sector and among the balance-sheet assets of the household sector, under the financial instrument heading "shares and other equity", as for component 3 of the survey's definition of "wealth in businesses".<sup>23</sup>

Although the underlying conceptual framework is the same, the survey definitions and those of the national accounts do not coincide perfectly. For the second, not only are partnerships and companies to be classified under "corporations and quasi-corporations" (and not under households) but so are sole proprietorships and informal and *de facto* partnerships with more than 5 employees, which are conventionally assumed to have autonomy of decision and which the survey instead considers to be indistinguishable from the households that own them.

If the aim is to compare the survey data with the macro estimates, the SHIW data on "wealth in businesses" must be reclassified taking account of the legal form and size

<sup>21</sup> Data on the value of the property used in the business is gathered in another part of the questionnaire.

<sup>22</sup> That is, it has no power of decision apart from its owner and no separate accounts for it can be reconstructed.

<sup>23</sup> Another peculiarity of the definition of "wealth in businesses" used in the survey compared with the national accounts is that component 3 includes only equity interests in firms in which the household performs a controlling or managing role. Other equity interests are considered components of the financial portfolio and thus part of households' financial wealth, a clear analogy with the distinction between "direct" and "portfolio" investment in balance-of-payments statistics. No such distinction is to be found however in the theoretical basis of the European System of Accounts, where all assets of this kind, regardless of the purpose for which they are held, are included among financial assets under the heading Shares and other equity.



of the businesses owned by households. The reclassification to be carried out for this paper is detailed in Table A2; very briefly, only the value of sole proprietorships and informal and de facto partnerships will be included among households' real assets, while the value of the remaining businesses apart from companies should be included among financial assets, under the instrument heading "shares and other equity".

### 3.3 *The comparison between the two sources*

As indicated in the preceding sections, to compare the macroeconomic estimates and those of the SHIW, the latter's data on "wealth in businesses" must be reclassified by adopting definitions that are more consistent with those of ESA95. Carried out on the data for 2004, this reclassification gives the results shown in Table A4. Of the "wealth in businesses" in 2004, equal on average to €20,363, real assets were allocated 63 per cent and financial assets the remainder.<sup>24</sup>

Table A5 shows the comparison between the values obtained from the 2004 survey and the estimate based on macroeconomic sources. For the real assets taken together the ratio between the two estimates is 88 per cent. The survey thus appears able to capture a large part of this component of household wealth. For dwellings the rate of overlap is about 93 per cent. The discrepancy between the two sources can be attributed to the survey's underestimation of the number of other than owner-occupied dwellings, which is offset, however, by an overestimate of the surface areas (Cannari and Faiella, in this volume).

Lower rates of overlap are found for land and non-residential buildings (63 and 52 per cent respectively) (Table A5). As far as the latter are concerned, it should be noted that in the sections of the survey devoted to "wealth in businesses" interviewees are requested to exclude the value of the buildings used in their business activities. Such buildings are included in another section of the survey, but it is possible that when interviewees come to this section they focus their attention on residential buildings and overlook those used in their business activities.<sup>25</sup> Indications regarding the importance of this phenomenon can be obtained by comparing the survey estimates of non-residential buildings with the figures published by the Ministry of Finances on the stock of non-residential buildings divided by type (offices, shops and workshops, and warehouses). Exclusively for transactions carried out during the year, it also provides a breakdown by the legal form of the seller and the buyer. Assuming that the proportion of individuals who carried out transactions in 2000 can be taken as a proxy for the proportion of individuals owning the stock of buildings, the OMI data can be used to obtain an estimate of the number of non-residential buildings owned by individuals, equal to 3.5 million in 2004, compared with the estimate of 1.7 million obtained on the basis of the data of the SHIW for the same year. Thus, for non-residential buildings, as for unoccupied residential buildings, the difference between the sources is due more to an underestimation of the stock than to a difference in its valuation.

The other components of "wealth in businesses" (machinery, inventories and goodwill) have rates of overlap around 90 per cent. As far as these forms of wealth are concerned, more accurate evaluations of the quality of the individual sub-components can

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<sup>24</sup> The average value of this item is €7,663, corresponding to about €170 billion for the entire population. The value with which to supplement the estimates of the financial accounts is comparable with the estimates obtained by Rodano and Signorini (in this volume).

<sup>25</sup> Starting from the survey referring to 2004, a question was introduced into the section of the questionnaire on the household's business activities concerning the use of buildings owned by the household in such activities. In the event of a positive answer, in the section of the questionnaire on real estate wealth the household is asked to give an estimate of the value of such buildings.

be made by using the data of the survey referring to 2004, in which interviewees were asked to provide information on some individual items of “wealth in businesses” (in particular, the value of plant and machinery, inventories and goodwill). In the survey on 2004 plant and machinery accounted for about 34 per cent of the total survey value of “wealth in businesses” (excluding buildings), inventories accounted for 22 per cent and goodwill for the remaining 44 per cent.

#### 4. Conclusions

Official estimates of households’ real assets are not available in Italy. Earlier research that reconstructed this component of wealth overlooked the components related to the activities of producer households.

This paper presents a method for obtaining a valuation of the components of the real assets related to households business activities. Moreover, for the first time valuables were estimated by means of a relationship with the stock of durable goods.

Using this new methodology, the value of households’ real assets was found to be €4,936 billion in 2005. The bulk of these assets consisted of dwellings (€3,887 billion) while nearly 20 per cent consisted of assets belonging to producer households. A substantial proportion of these assets were found to consist of buildings used in households’ business activities (land and non-residential buildings and other components of fixed capital). Valuables accounted instead for less than 3 per cent of the total value of households’ real assets.

The macro estimates of real wealth were then compared with the SHIW data available for 2004 after reconciling the definitions adopted in the survey and redefining some aggregates that go to make up wealth, so as to render them comparable with the macroeconomic estimates. In particular, only the value of sole proprietorships and informal and de facto partnerships with up to 5 employees was included among households’ real assets, while the value of the remaining businesses apart from companies was included among financial assets. After the reclassification the SHIW estimate of “wealth in businesses”, equal to €20,363 per household in 2004, was divided as follows: 69 per cent to real assets and the remainder to financial assets.

The comparison with the macroeconomic estimates shows that the survey can estimate them with a fair degree of accuracy. For 2004 the sample estimates were equal to about 88 per cent of the macro estimates. The “rate of overlap” was particularly high for dwellings (93 per cent), the stock of capital, inventories and goodwill (89 per cent) and valuables (81 per cent). By contrast, the SHIW estimates were less able to capture the property component linked to the activities of producer households. In fact land and non-residential buildings had rates of overlap of 63 and 52 per cent respectively.

**APPENDIX**  
**STATISTICAL TABLES**

Table A1

**Nomenclature of assets in ESA95**

<b>AN.</b>	<b>NON FINANCIAL ASSETS</b>
<b>AN.1</b>	<b>Produced assets</b>
AN.11	Fixed capital
AN.111	Produced tangible goods
AN.1111	Dwellings
AN.1112	Non-residential buildings and other works
AN.1113	Plant and machinery
AN.1114	Crops and livestock
AN.112	Produced intangible goods
AN.12	Inventories
AN.13	Valuables
<b>AN.2.</b>	<b>Non-produced assets</b>
AN.21	Non-produced tangible goods
AN.211	Land
AN.212	Deposits
AN.213	Non-cultivated biological resources
AN.214	Water resources
AN.22	Non-produced intangible goods
AN.221	Patents
AN.222	Leasing contracts and other transferable contracts
AN.223	Goodwill of commercial activities
AN.229	Other non-produced intangible goods
<b>AF.</b>	<b>FINANCIAL ASSETS</b>
AF.1	Monetary gold and special drawing rights (SDRs)
AF.2	Notes, coins and deposits
AF.3	Securities other than shares
AF.4	Loans
AF.5	Shares and other equity
AF.51	Shares and other equity, shares/units of investment funds
AF.52	Shares/units of investment funds
AF.6	Technical provisions of insurance companies
AF.7	Other asset and liability accounts
AF.71	Trade credits and advances
AF.79	Other

Table A2

**Reclassification of “wealth in businesses”**

<b>Survey items subject to reclassification</b>	<b>Survey definition</b>	<b>Definition consist with macroeconomic estimates</b>
Non-residential buildings	Included in “wealth in buildings”	Reallocated to the item <i>Capital stock, inventories and goodwill</i>
Value of the business for professionals, sole proprietors, self-employed and quasi-employees (Annex B2 of the questionnaire)	Included in “wealth in businesses”	For businesses with up to 5 employees the component is reallocated to the item <i>Capital stock, inventories and goodwill</i>  For businesses with more than 5 employees the component is reallocated to the item <i>Shareholdings in corporations and quasi-corporations</i>
Value of the business for household businesses (Annex B3 of the questionnaire)	Included in “wealth in businesses”	For businesses with up to 5 employees the component is reallocated to the item <i>Capital stock, inventories and goodwill</i>  For businesses with more than 5 employees the component is reallocated to the item <i>Shareholdings in corporations and quasi-corporations</i>
Shareholdings in companies (Annex B4 of the questionnaire)	Included in “wealth in businesses”	For (all) the companies the component is reallocated to the item <i>Shares and other equity</i>  For the remaining businesses with up to 5 employees the component is reallocated to the item <i>Capital stock, inventories and goodwill</i>  For the remaining businesses with more than 5 employees the component is reallocated to the item <i>Shareholdings in corporations and quasi-corporations</i>

Table A3

**Households' real assets**  
(billions of current euros)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Dwellings .....	2,113	2,232	2,375	2,407	2,436	2,580	2,753	3,033	3,328	3,578	3,887
Valuables.....	79	82	85	88	95	104	111	118	124	130	134
Non-residential buildings ..	177	186	197	200	203	215	229	255	277	291	312
Plant, machinery, equipment.....	115	122	132	143	155	170	184	198	209	219	229
Inventories.....	63	67	69	72	74	77	78	81	84	87	89
Goodwill.....	26	28	29	31	32	34	37	41	44	46	48
Land .....	179	182	188	194	198	206	215	223	231	236	237
<b>Total real assets</b>	<b>2,751</b>	<b>2,898</b>	<b>3,076</b>	<b>3,135</b>	<b>3,195</b>	<b>3,386</b>	<b>3,606</b>	<b>3,950</b>	<b>4,297</b>	<b>4,587</b>	<b>4,936</b>
<i>Memorandum item:</i>											
Durable goods .....	405	428	446	469	486	506	527	546	565	580	598

Source: OMI, CRESME, Inea, Istat and SHIW data. For the details of the methodology used, see the text.

Table A4

**SHIW estimates and reconciliation with the ESA95 definitions**  
(year 2004, averages per household in euros)

Definitions aligned with ESA95		SHIW definitions		
		Real assets <b>187,410</b>		
		Buildings <b>162,336</b>	Businesses <b>20,363</b>	Valuables <b>4,711</b>
Real assets <b>180,948</b>	Dwellings <b>148,972</b>	148,972		
	Land <b>6,493</b>	6,493		
	Non-residential buildings <b>6,737</b>	6,737 <sup>(1)</sup>		
	Plant, machinery, equipment, inventories and goodwill <b>14,035</b>	14,035 <sup>(2)</sup>		
	Valuables <b>4,711</b>	4,711		

(1) Non-residential buildings. (2) Value of the businesses excluding buildings.

Source: SHIW 2004 annual archive data.

Table A5

**Real assets of households: comparison of  
macroeconomic estimates and survey results**  
(year 2004, billions of current euros)

	Macro estimates	Survey results <sup>(1)</sup>	Rate of overlap
Dwellings .....	3,578	3,327	93.0
Valuables .....	130	105	80.8
Non-residential buildings.....	291	151	51.9
Plant, machinery, equipment, inventories and goodwill ...	352	313	88.9
Land.....	231	145	62.8
<b>Total real assets.....</b>	<b>4,587</b>	<b>4,041</b>	<b>88.0</b>
<i>Memorandum item:</i>			
Durable goods.....	580	441	76.0

(1) SHIW 2004 annual archive data.

Source: OMI, CRESME, Inea, Istat and SHIW data. For the details of the methodology used, see the text.

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**DISCUSSION OF THE PAPER BY L. CANNARI,  
I. FAIELLA, G. MARCHESE AND A. NERI**

*Alessandra Agostinelli\**

## **1. Introduction**

First of all, I wish to congratulate my colleagues at the Bank of Italy for their outstanding work, which went well beyond the call of duty. I applaud their unflinching commitment to this project.

I also wish to thank the conference organizers, who gave me this opportunity to comment on the excellent work of Cannari, Faiella, Marchese and Neri. The analysis of household wealth and its financial and non-financial components is a highly interesting field and crucial to understanding economic realities. As the authors recall in their introduction, however, Italy still does not have official macroeconomic data on the value of the real assets held by households and the other institutional sectors. There is a significant information vacuum, which Istat is now addressing. In fact, based on the revised ESA95 transmission programme referred to in a regulation, starting in 2010 the national accounts must include annual wealth data for all the institutional sectors: households, non-profit institutions serving households, financial corporations, non-financial corporations and general government. Countries must also provide a historic series covering the period 1995-2009.

The most ambitious objective would be to construct a complete set of accounts for each sector (comprising the opening balance sheet, the real, financial and cumulative accounts, and the closing balance sheet), in other words to complete the entire sequence of accounts prescribed under the European System of National Accounts. The desirability of starting work on the completion of the accounts was recently recalled in the 2007 EFC Status Report on Information Requirements in EMU, endorsed by Ecofin and prepared by Eurostat and the ECB. This is certainly an important area of common research for the Bank of Italy and Istat.

Stronger cooperation between our institutes is therefore vital in order to provide increasingly detailed statistical data for economic analysis and policy-making purposes. A first important result of this cooperation is the reduction in the discrepancies between the balances of the real and financial accounts in the latest annual data.

National accounts researchers are conducting a preliminary study aimed at defining a set of wealth accounts for a single year, probably 2005, for which more reliable data are available. We received funding for this project from Eurostat, to which we have pledged to report our findings by June 2008. Our aim is to estimate the principal real assets for the household sector and for financial and non-financial corporations. As regards produced assets, we are focusing on the valuation of dwellings, non-residential buildings, machinery and equipment, telecommunication devices, personal property and means of transport. For non-produced assets, the aim instead is to estimate land and software. It was agreed that estimates of inventories and the stock of valuables would only be made at a later stage.

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An assessment of fixed capital stock is already available for general government. Although highly desirable, a lack of resources means it is not currently possible to extend the estimates to include other real assets.

The work presented today by the Department for Structural Economic Analysis, which is part of a long tradition of research into the real wealth of households at the Bank of Italy,<sup>1</sup> makes an important contribution to the branch of research concerned with defining wealth accounts. Not only does it broaden the area of inquiry in assessing the wealth components of producer households, but it also offers some very interesting conceptual and methodological food for thought. Indeed, the interpretation and analysis of the document stimulated lively debate among the group of national accounts researchers responsible for developing the wealth accounts in Istat. I will confine my observations to just some of the many interesting issues discussed. My remarks are not to be taken as criticisms; rather my aim is to provide some ideas on how to further refine estimates of the real assets of households.

The authors begin by observing how the classification criteria used for the institutional sectors interact with the accounting scheme for assets and liabilities. They recall that although the setting of the threshold of five employees<sup>2</sup> to distinguish producer households from quasi-corporations is not imposed by ESA95, Istat chose to adopt it as a working criterion in line with the system's general principles. The classification criteria were agreed by the working group comprising representatives from the then Ministry of the Treasury and Finance, Italy's supervisory body for private insurance companies (ISVAP), the Italian Exchange Office (UIC) and the Bank of Italy. The question now arises as to the advisability of reviewing the classification criteria, perhaps in light of new data collected in the last ten years that ought to be taken into account for the purposes of classification by institutional sector.

The main parameter used to define the classification scheme was based on the consideration that due to labour-saving manufacturing processes, which evolve over time, a firm with over 5 employees develops a relatively high volume of business requiring complex accounting procedures and separate management with respect to its owners. We can be reasonably certain that the corporate/organizational policies which emerged at that time have neither come to a halt nor been reversed in the past decade. If this element continues to be important in distinguishing between the producer household and quasi-corporation sectors, it may prove advisable to move towards a more restrictive definition of the sector. Still, it is difficult to express any definite opinion on this issue without inquiring into how the relationship between the volume of business and the input of labour in small enterprises developed over the last decade.

Other interesting questions emerge from a comparative analysis of the annual accounts by institutional sector of EU countries, which show how overall the household sector in Italy (consumer and producer households) shows broadly similar characteristics to those of the same sector in other member states and is in keeping with the spirit of ESA95. These data are included in the Appendix.

The authors note that non-profit institutions serving households are included in the household sector “...*primarily because households are ultimately the beneficiaries of the goods and services offered to them at particularly advantageous conditions by the non-*

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<sup>1</sup> As demonstrated by the work of Tresoldi, Visco, Pagliano, Rossi and Brandolini.

<sup>2</sup> The paper does not specify that the upper limit is defined in terms of employees and that accordingly the firms to be classified in the producer households sector may have a total of over five workers: This clarification is necessary above all for the criteria adopted in the data processed by the authors in the SHIW survey, because the difference in micro-data could lead to significant distortions.

*profit institutions and accordingly their social/non-profit function and economic behaviour can be easily assimilated with that of the households themselves*". I wish to underline how the economic behaviour and recent evolution of this sector merit a specific analysis, and in fact a complete set of non-financial accounts is constructed for these operators, as distinct from the non-financial accounts of households. While it is true that the beneficiaries of the services produced are households, the processes for their provision cannot be completely assimilated with those that characterize households acting as consumers or producers. These operators avail of resources they obtain in the form of transfers by enterprises, households and general government, or from their own resources (for example, the 56 banking foundations that completed the transformation processes established under the Ciampi law and are accordingly classified in the non-profit institutions category).

Awareness of the statistical importance of these economic actors is growing. In this connection I wish to recall Istat's commitment to improving statistical reporting in this area: twice-yearly sector surveys for voluntary organizations (since 1996) and social cooperatives (since 1999) are now standard practice. Moreover, the institute is about to publish the results of a survey of over 4,700 foundations.

## 2. Dwellings

Let us now turn to the heart of the matter: dwelling estimates. The scope of the assessment is to calculate the value of all the dwellings owned by households defined as individuals. The estimate is based on the Census data of the stock of dwellings owned by natural persons in 1991. This appears to confirm the hypothesis according to which for sole proprietorships (i.e. for producer households), residential property holdings may not be included in the assessment. This assumption, moreover, is entirely in line with the hypothesis adopted in the national accounts when assigning investment income to consumer households and producer households, in other words that financial wealth is held by consumer households.

Note that in order to conform with the ESA95 rules, which considers rental revenue a product sold on the market, the proportion of owner-occupied dwellings should be assigned to the consumer household stock while the share of rented dwellings should be assigned to the producer household stock. Indeed, non-financial accounts assign actual rents to the output of producer households, while only imputed rents<sup>3</sup> are assigned to consumer households, whose output is destined exclusively for self-consumption. The research estimates the total number of dwellings and does not make any further subdivision. However, there is currently no data source enabling us to distinguish between dwellings occupied by owners (or in any event maintained by them and not rented out) and those that are rented out. Nonetheless, a distinction could be attempted by employing a series of indicators. For example, taking the cadastral data as a starting point, duplicate tax code numbers could be extracted to identify who owns more than one dwelling and from there some hypothesis could be formulated as to additional dwellings, possibly based on location or other criteria.

Turning to the estimation methodology, the results reported are based on calculations from another research paper by Cannari and Faiella presented at this seminar, entitled "House Prices and Housing Wealth in Italy". This includes an Appendix prepared by Bassanetti and Zollino illustrating the method for estimating the historical series of the stock of property owned by households.

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<sup>3</sup> Those relating to owner-occupied dwellings.

To define the number of dwellings and related surface areas, the authors took as their starting point the 1991 Census of the population and dwellings, which distinguishes between occupied and unoccupied properties. The number of dwellings was subsequently updated to 2001 on the basis of CRESME data on new buildings; an average surface area value was then applied, obtained by interpolating data from the two censuses. The difference between the resulting annual estimates and the value for the 2001 Census was rectified using an adjustment parameter. CRESME data are used up to 2004; beginning in 2005 the data are those provided by the Property Market Observatory. The method used to define the average surface area for the years after 2001 is not very clear.

I have two observations to make in this respect.

The first concerns the use of only data on new buildings to increase the stock of dwellings owned by households: this does not take account of property transfers across sectors. True, these transactions are difficult to identify, but account should at least be taken of the disposal of real estate assets by general government, in particular in 2002 and 2003 under the securitization transaction known as SCIP 1.<sup>4</sup> Based on our estimates, in these two years SCIP 1 transferred dwellings equal to around €1,600 and €700 million respectively to households; a series of other disposals were also made of less substantial amounts, which are nonetheless available.

Moreover, the use of data from the Property Market Observatory instead of those from CRESME on the number of new dwellings ought to be supported by demonstrating the consistency of the two series.

To conclude, it is useful to reflect on the inclusion in the calculations of illegally built residential properties, an estimate of which could be included in the data provided by CRESME, but is certainly not in those provided by the Property Market Observatory. The problem of reductions due to the destruction of buildings is clearly less significant.

My second observation regards the average surface area estimates. As in the Survey of Household Income and Wealth (SHIW), the surface areas reported in the 2001 Census are confined to the interior of the dwelling: it therefore excludes the boundary walls, appurtenances and any adjacent terraces, balconies or gardens. This leads me to conclude that the use of census data risks underestimating the actual stock of residential wealth.

Furthermore, the surface areas of unoccupied dwellings are estimated taking as a starting point the average surface areas of occupied dwellings in the SHIW. It is a method that causes some puzzlement, essentially to do with the actual representativeness of the sample survey and especially with regard to some variables. Even if they are not published, the census data on the average surface areas for both occupied and unoccupied dwellings are available on request.

In Istat we began work on the estimate of dwellings and received very interesting data from the Property Market Observatory on the number of dwellings, rooms, square metres and the unitary market value, classified according to the owner (natural person or "other"). We have just verified that as of the 2001 Census data there were a little over 27 million occupied and unoccupied dwellings; those owned by natural persons totalled around 20 million, to which, however, must be added some of the unoccupied dwellings whose ownership is not known. In 2005 the Property Market Observatory reported a total of just under 30 million dwellings, of which almost 28 million owned by natural persons. Even if the number of unoccupied dwellings at the time of the Census is probably underestimated, the Property Market Observatory data appear to overestimate residential

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<sup>4</sup> The state property securitization company established to conduct the operation.

wealth and the difference is so large that it cannot be explained exclusively with reference to ruins and abandoned buildings in the cadastral data not registered as dwellings. It is essential that the reasons for such a large discrepancy between the two data sources be analyzed.

Regarding the prices applied to value the residential stock owned by households, the results of Cannari and Faiella's research is most interesting, insofar as they succeed in reconstructing a homogenous time series by integrating a number of sources. It is well known that the retrospective reconstruction of data is one of the thorniest problems faced by statisticians, who are often challenged by the creation of new data sources whose emergence can significantly improve the quality of the estimates produced but for which no retrospective data exist. Their reconstruction, in fact, can only be accomplished using complex procedures.

This is the case of the unitary market values calculated by the Property Market Observatory, which as is known, are a combination of three elements: the transfer prices based on the exchange of contracts, the offering prices provided by real estate agencies, and market assessments made with the help of professionals and other experts. As of 2006 the Property Market Observatory has increased the proportion of house sales measured based on the related transfer deeds for its price calculations, and accordingly the quality of the data has greatly improved. The new rules in the 2006 Finance Law envisage that the registration tax in real estate transfers must be calculated on the basis of the cadastral value and not the market value of the property. This should bring out the true prices of the properties being exchanged, eliminate the phenomenon of underestimation and enable the property market to be constantly monitored. Istat sees this as a highly important development for the purposes of the EU project to construct an experimental residential property price index. Amongst other initiatives, an agreement has been reached with the Property Market Observatory for the collection of the data needed for the construction, joint production and publication of the indices.

One significant problem in the estimate of dwellings, and in general of buildings, has to do with the distinction made between them and the value of the underlying land, which should be classified in the non-financial non-produced assets category (Land under buildings and structures, AN2111). It is clear that an estimate based on an area to which market prices are applied includes the value of the land. The issue was recently addressed at the OECD meeting of national accounts experts held in early October. In fact, for the purposes of estimating wealth this does not appear to be a vital issue: what matters is that the value of the land is included, irrespective of whether this is together with the value of the property or not, and not duplicated when the stock of land owned by the sector in question is assessed.

### **3. Valuables**

Estimating valuables owned by households presents several difficulties. In the National Accounts the net flow of acquisitions of valuables is estimated using the commodity flow approach and is confined to households' purchase of jewels and banks' purchases of non-monetary gold to loan. While the proposed methodology is undoubtedly interesting, it should be borne in mind that deriving information on the possession of valuables from the SHIW can lead to an underestimation. In fact, it is no secret that household surveys tend to underestimate the revenue and wealth of the top percentiles. Clearly this has a stronger impact on the wealth components, which are more highly concentrated.

#### 4. Non-residential buildings

Estimates of non-residential buildings could be improved. First, it is not very clear from which year the Property Market Observatory data are available or to which cadastral categories reference is made. In fact, for the A10 (public and private offices), C1 (shops and stores) and C2 (workshops) categories, the reference property unit for cadastral registration is the individual apartment, office or shop, for which both the number and average surface area are known. On the contrary, for category D (functional buildings), the property unit registered is the entire building, whether it is a factory or group of offices; of these units only the number is known and in this instance it is extremely difficult to define an accurate average surface value to be applied.

In this context use of 2001 Industry and Service Census data appears desirable.

#### 5. Plant, machinery and equipment

The authors' chosen approach for estimating the stock of plant, machinery and equipment belonging exclusively to producer households is based on several rather strong hypotheses. Note that the sector's investment flows estimated by Istat include residential dwellings owned by households and rented out, and not only non-residential dwellings and plant and machinery used for productive activities, as the paper assumes.

Furthermore, for producer households the share of plant and machinery available as a proportion of total fixed assets is not necessarily analogous to its ratio in the economy as a whole. This is because the proportion may be larger when small enterprises fail to exploit economies of scale, and smaller in some economic activities that are more labour intensive.

In any event, a retrospective reconstruction from 1980 onwards was recently begun for sector investments divided by institutional sector, economic activity and 11 types of good, on the basis of which, using a suitable backward calculation from 1970 onwards, the permanent inventory method for defining the stock can be applied.

Regarding implicit deflators for fixed investment and depreciation allowances in national accounts, the question of the use of chained price indexes now arises. These indexes recently substituted fixed base indexes (1995 was the base year). Given that the new indexes do not allow the quantities to be added at constant prices (additive properties), the work used indexes that retain this property.

The problem of deflation when using chained price indexes was also raised at the last meeting of the Canberra group. The most recent version of the OECD's *Manual on measuring capital* addresses this issue in section 15.6, where it is stated that: "*The more detailed the asset classification that constitutes the starting point for revaluating investment series, the less important the issue*", in other words the greater the degree of disaggregation, the more accurate the chained price indexes.

#### 6. Inventories and goodwill

As I mentioned at the beginning, I have not yet had time to deal with the issues related to estimating the value of stock of inventories or of goodwill, and am therefore unable to comment in detail on the methodological choices presented in the paper. I can, however, support the hypothesis made by the authors that enterprises with a turnover of less than €470,000 could constitute a reasonable proxy of those with up to 5 employees: in fact, the data we have from the statistical business register (ASIA) for 2004 show that

out of 4 million enterprises with up to 5 employees, more than 3.8 million report a turnover of less than €500,000; of these more than 3.4 million were not classified as companies.

## **7. Land**

To estimate the stock of land is certainly a very complex matter, especially if extended to include non-agricultural land.

The work avails of a combination of data from the National Institute of Agricultural Economics (INEA), the latest agricultural Census, and the ratio between the agricultural land and the total land held by households drawn from the SHIW.

It would be extremely interesting to explore the possibility of using Land Registry Office data.

The INEA prices could turn out to be scarcely representative because they relate to land that is bought and sold, and therefore the underlying quantities change over time. The values reported refer to land and/or entire farms with a significant sales or rental activity. It is therefore likely that marginal categories of land are underrepresented, insofar as they are normally subject to only very modest transaction activity. However, Germany, Canada and Australia, whose methodologies were illustrated at the meeting of the OECD National Accounts meeting referred to above, also use prices referring to land transfers.

It may prove useful, at least in order to set a lower limit on the value of the stock, to compare the estimate based on the surface area times price ratio, with the results of the estimate-based models that obtain the value of land by discounting land revenues (gross saleable production minus sundry costs).

## APPENDIX DEFINING THE HOUSEHOLD SECTOR IN EURO-AREA COUNTRIES

*Stefania Cuicchio\**

The process of European integration originally called for, and is now the driving force behind the production of timelier, better structured and more detailed aggregate economic indicators for the euro area, in order to satisfy the requirements of political and monetary authorities. This is the backdrop to the relatively recent institution of annual and quarterly economic and financial accounts for the institutional sectors of euro-area countries, published by Eurostat and the ECB at t+4 months, beginning respectively in 2005 and 2006.

The production of aggregate indicators for the euro area poses several serious problems regarding the comparability of the definitions and estimation methodologies adopted by the member states, which, in adapting to the requirements of Community regulations, are obliged to take account of the specific traits of national economies. The greater the level of detail and the more structured the aggregate indicators produced, the greater is the need for comparability.

For the non-financial accounts by institutional sector it is vital to assess the comparability of national statistics, especially in light of the operational criteria used to classify economic agents in conformity with the approved ESA95 definitions. The household sector is particularly difficult to define clearly: despite their having economic elements in common, the units classified in the various EU countries differ both in terms of organization and size.<sup>5</sup> On the other hand, the application of a single criterion would not necessarily improve comparability: despite its responding to different classificatory criteria, the household sector of many EU countries shows similar behaviour and broadly comparable characteristics across economic units. Even when taking very different economic realities as a starting point, the definition of the institutional sectors appears in many instances to be in accordance with the spirit of ESA95.

Undoubtedly the household sector<sup>6</sup> in Italy is among the largest in Europe. As can be seen in Table 1, it accounts for over 33 per cent of gross value added of the Italian private sector,<sup>7</sup> on a par with Spain and well ahead of the Netherlands and Finland (which report shares of less than 20 per cent). The proportion in Italy is also higher than in Belgium (around 20-23 per cent), Slovenia, France and Germany (around 25-26 per cent) and Austria and Portugal (around 29 per cent).

The relative dominance of the household sector in Italy is explained by the large proportions of self-employed workers and small-sized enterprises. Tables 2 and 3 show the percentage distribution of firms and their workers based on their size and legal form. The data are drawn from the statistical business register (ASIA) and updated each year by Istat. Some 90 per cent of firms have up to 5 workers and of these about 65 per cent are sole proprietorships, classified in the household sector together with larger firms that

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\* Istat, Rome.

<sup>5</sup> A review of the classification criteria used to define institutional sectors adopted by several European countries was carried out in 2003 in the context of the Task Force on Quarterly European Accounts by Institutional Sector, coordinated by Eurostat and the European Central Bank; the survey's initial findings were reported in the document, "Sector delineation - Results of the questionnaire" presented at the Task Force meeting of October 2003.

<sup>6</sup> In this analysis the household sector comprises non-profit institutions serving households.

<sup>7</sup> The comparison is made with respect to the total of national private sectors, excluding general government.



have up to 5 employees. These enterprises account for around 40 per cent of all the workers surveyed, 25 per cent of whom work in small sole proprietorships.<sup>8</sup>

### Productive units classified in the household sector of several European countries

Belgium	The market producers in the sector are enterprises without any independent legal status: these are units with just a few employees, since for administrative and tax reasons larger firms tend to be organized as moral persons classified in the non-financial corporations sector (which does not contain quasi-corporations).
Germany	Market producers in the sector are sole proprietorships, self-employed workers and partnerships without any independent legal status (private companies are classified in the non-financial corporations sector as quasi-corporations).
France	Market producers in the sector comprise all sole proprietorships; these units have no independent legal status (the non-financial corporations sector does not contain quasi-corporations).
Italy	Market producers in the sector comprise all sole proprietorships and informal and de facto partnerships that employ up to 5 employees.
The Netherlands	Market producers in the sector comprise self-employed workers and all undertakings other than companies owned by households with less than 100 workers (undertakings with no legal personality with over 100 workers are classified as quasi-corporations in the non-financial corporations sector).
Portugal	Market producers in the sector comprise self-employed workers, structures that envisage the activity of the independent founder only that also includes the equivalent of Italy's private limited companies with a sole shareholder.
Finland	Market producers in the sector comprise self-employed workers and undertakings other than companies with less than two employees including the owner.

Source: Task Force on Quarterly European Accounts by Institutional Sector.

<sup>8</sup> The ASIA archive is one of the main data sources for estimating the input of labour from the firm side. Estimating labour input in terms of National Accounts full time equivalences is based on a complex procedure, which by comparing and integrating various data sources on firms and households ensures that the non-observed components of labour in the underground and unrecorded economies are also estimated, with the aim of ensuring comprehensive GDP data.

Table 1

**Percentage ratio of gross value added of the household sector to that of national private sectors<sup>a</sup> in the principal euro-area countries**

	Italy	France	Germany	Belgium	The Netherlands	Slovenia	Portugal	Spain	Austria	Finland	Euro area
1999	33.6	25.7	27.0	22.8	20.0	-	-	-	28.6	17.8	28.4
2000	33.3	25.4	27.0	22.5	20.0	25.5	29.1	32.5	28.5	17.3	28.3
2001	32.9	25.8	26.6	22.4	19.8	24.8	28.8	32.7	28.4	17.2	28.2
2002	33.4	25.7	26.7	21.8	19.1	25.9	28.5	33.1	28.8	17.7	28.3
2003	33.8	25.4	26.3	21.7	18.7	24.5	28.6	33.5	28.7	18.3	28.3
2004	34.0	25.5	25.8	21.1	18.7	24.3	-	33.8	28.7	18.1	28.2
2005	34.0	25.8	25.5	20.6	18.5	24.1	-	-	28.8	18.1	28.3
2006	34.1	26.1	25.3	20.4	19.3	-	-	-	28.4	17.3	28.5

Source: Eurostat.

<sup>a</sup> National private sectors refer to the total private sector, excluding general government.

Table 2

**Percentage distribution of firms in the ASIA register by size and legal form**

Size	Legal form	1996	1997	1998	1999	2000	2001	2002	2003	2004
1-5	IND <sup>a</sup>	-	69.1	68.1	68.2	67.9	67.0	66.4	65.5	65.5
	SP <sup>b</sup>	-	14.2	15.1	15.0	15.3	15.5	15.0	14.8	14.6
	SK <sup>c</sup>	-	8.0	8.2	7.6	8.3	8.9	9.1	9.5	9.8
	Total	-	91.2	91.3	90.8	91.4	91.3	90.5	89.9	89.9
6-9	IND <sup>a</sup>	-	1.3	1.2	1.3	1.2	1.2	1.4	1.5	1.5
	SP <sup>b</sup>	-	1.8	1.9	2.0	1.7	1.7	1.9	2.0	2.0
	SK <sup>c</sup>	-	1.2	1.2	1.3	1.3	1.4	1.5	1.7	1.7
	Total	-	4.3	4.3	4.6	4.2	4.3	4.8	5.2	5.2
10-19	IND <sup>a</sup>	-	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5
	SP <sup>b</sup>	-	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.0
	SK <sup>c</sup>	-	1.2	1.2	1.4	1.3	1.4	1.6	1.7	1.7
	Total	-	2.8	2.8	3.0	2.8	2.8	3.0	3.2	3.2
20-	IND <sup>a</sup>	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SP <sup>b</sup>	-	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
	SK <sup>c</sup>	-	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4
	Total	-	1.7	1.6	1.7	1.6	1.6	1.6	1.7	1.7
Total	IND <sup>a</sup>	-	71.0	69.8	70.1	69.5	68.6	68.3	67.6	67.5
	SP <sup>b</sup>	-	17.3	18.3	18.3	18.2	18.4	18.2	18.1	17.9
	SK <sup>c</sup>	-	11.7	11.9	11.6	12.2	13.0	13.6	14.2	14.7
	Total	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Istat

<sup>a</sup> IND = sole proprietorship (impresa individuale); <sup>b</sup> SP = partnerships (società di persone); <sup>c</sup> SK = companies (società di capitali).

On analysing the relative importance of labour inputs by employee earnings (Table 4), the differences compared to the other EU countries appear less marked and the country groups based on the value added aggregate are modified. The proportion of revenues from salaried employment paid by the sector is around 10 per cent of that paid

by national private sectors; similar to the proportion in Slovenia and slightly higher than in France and the Netherlands (where it is close to 9 per cent). In Belgium and Finland the input of salaried labour in the household sector is much lower, accounting for around 4.5 per cent and 7 per cent respectively. The picture is very different in Portugal and Spain, where the household sector's share of employee earnings paid by national private sectors is 12-14 per cent. In Germany and Austria it is over 17 per cent. The classification criteria adopted in these countries include in the household sector productive units whose structure incorporates a substantial component of salaried employment.

If we go on to compare the ratio for the household sector of gross operating profits and mixed income to gross value added the similarities become greater. The ratio in Italy, around 86 per cent, is not significantly different from those in Belgium (around 85 per cent) and Finland (around 88 per cent). Nor is it very far removed from those of Spain, France, Portugal and Slovenia (around 78-80 per cent). Irrespective of the classification criteria used, the economic behaviour of operators in the household sector of the countries considered is in keeping with the spirit of ESA95, which aims to include productive activities primarily carried out through forms of independent labour and self-employment in the household sector. By contrast, for Germany, Austria and the Netherlands, the share of value added that remunerates the entrepreneurial factor is significantly lower, equal respectively to around 63 per cent, 65 per cent and 74 per cent, indicating highly-structured productive units that rely on a relatively greater amount of salaried employment.

Table 3

**Percentage distribution of workers of active enterprises in  
the ASIA register by size and legal form**

Size	Legal form	1996	1997	1998	1999	2000	2001	2002	2003	2004
1-5	IND <sup>a</sup>	29.6	27.7	27.2	27.1	27.0	26.4	25.7	25.0	24.6
	SP <sup>b</sup>	9.7	9.3	10.1	9.7	9.9	10.0	9.5	9.3	9.2
	SK <sup>c</sup>	4.3	4.2	4.3	4.1	4.5	4.8	4.7	4.8	5.0
	Total	43.7	41.2	41.6	40.9	41.4	41.1	39.9	39.1	38.7
6-9	IND <sup>a</sup>	2.9	2.7	2.4	2.5	2.4	2.3	2.5	2.7	2.7
	SP <sup>b</sup>	3.7	3.7	3.9	3.8	3.5	3.5	3.7	3.7	3.7
	SK <sup>c</sup>	2.4	2.5	2.5	2.6	2.7	2.8	3.0	3.2	3.3
	Total	9.0	8.9	8.9	8.9	8.6	8.6	9.2	9.6	9.7
10-19	IND <sup>a</sup>	2.0	1.9	1.8	1.8	1.6	1.6	1.6	1.7	1.7
	SP <sup>b</sup>	4.0	4.0	4.0	4.0	3.7	3.5	3.6	3.6	3.5
	SK <sup>c</sup>	4.6	4.8	4.9	5.2	5.2	5.4	5.8	6.1	6.3
	Total	10.6	10.6	10.6	10.9	10.6	10.5	11.0	11.4	11.5
20-	IND <sup>a</sup>	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.5
	SP <sup>b</sup>	2.3	2.4	2.3	2.2	2.0	1.8	1.8	1.8	1.8
	SK <sup>c</sup>	33.4	36.2	35.9	36.3	36.9	37.3	37.6	37.5	37.9
	Total	36.7	39.3	38.9	39.2	39.4	39.7	39.9	39.8	40.1
Total	IND <sup>a</sup>	35.5	33.0	32.1	32.1	31.5	30.8	30.3	30.0	29.4
	SP <sup>b</sup>	19.7	19.4	20.3	19.7	19.1	18.9	18.6	18.5	18.2
	SK <sup>c</sup>	44.8	47.6	47.6	48.2	49.3	50.3	51.1	51.5	52.4
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Istat.

<sup>a</sup> IND = sole proprietorship (impresa individuale); <sup>b</sup> SP = partnerships (società di persone); <sup>c</sup> SK = companies (società di capitali).

Table 4

**Employee earnings paid by undertakings in the household sector as a percentage of those of total national private sectors <sup>a</sup> in the principal EMU countries**

	Italy	France	Germany	Belgium	The Netherlands	Slovenia	Portugal	Spain	Austria	Finland	Euro area
1999	10.3	9.1	17.2	4.6	8.9	-	-	-	20.3	6.9	13.4
2000	10.0	9.1	17.1	4.5	8.9	10.2	12.4	14.2	20.4	6.8	13.4
2001	10.0	9.0	17.0	4.3	9.0	10.0	12.6	14.1	19.8	6.7	13.3
2002	10.6	8.9	17.0	4.4	9.1	11.3	12.5	14.3	20.0	6.9	13.3
2003	10.4	8.7	17.0	4.5	9.0	9.8	12.3	14.4	20.0	7.2	13.2
2004	10.2	8.7	16.7	4.4	9.0	9.5	-	14.5	20.1	7.3	13.1
2005	10.9	8.7	16.4	4.3	9.0	9.4	-	-	20.1	7.3	13.1
2006	11.1	8.7	16.5	4.3	8.9	-	-	-	20.2	7.3	13.2

<sup>a</sup> National private sectors refer to the total private sector, excluding general government.

Table 5

**Percentage ratio of the gross operating profits to gross value added in the household sector in the main euro-area countries**

	Italy	France	Germany	Belgium	The Netherlands	Slovenia	Portugal	Spain	Austria	Finland	Euro area
1999	85.7	77.8	63.7	84.6	75.7	-	-	-	62.6	87.6	74.6
2000	86.1	78.1	63.1	85.1	75.6	77.4	79.5	77.3	63.1	88.2	74.6
2001	86.1	78.8	63.0	84.9	75.1	77.2	79.7	77.7	63.8	87.8	74.8
2002	85.3	78.5	63.3	83.8	73.7	75.5	79.4	78.0	64.3	87.8	74.9
2003	85.7	78.5	62.9	83.6	73.1	78.5	79.2	78.4	64.7	87.0	75.0
2004	86.0	78.5	63.5	83.5	73.0	79.2	-	78.6	65.7	86.2	75.4
2005	85.0	78.4	64.5	83.9	73.4	79.8	-	-	66.9	85.9	75.6
2006	84.6	79.3	64.5	83.9	74.7	-	-	-	66.8	87.2	76.0

## MEASURING THE VALUE OF MICRO-ENTERPRISES

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### 1. Introduction and summary

Census data show that in Italy about 3.4 million nonfinancial enterprises (out of a total of 4 million) are sole proprietorships or other unincorporated businesses<sup>1</sup>. Virtually all are very small “micro-enterprises”. Such enterprises account for just less than one half of employees<sup>2</sup> in the nonfinancial sector and therefore contribute significantly to the overall economic activity. Likewise, their value is likely to account for a significant share of national wealth. However, the unavailability of direct statistical sources such as balance sheet data makes the measurement of their value a tricky task.

According to international statistical standards, unincorporated businesses belong to either the households sector (“producer households”) or the non-financial corporations sector (“quasi-corporations”), depending on size and other characteristics. This distinction makes a difference to how their assets and liabilities are recorded in macroeconomic accounts (financial accounts and balance sheets). In the case of producer-households firms, their financial assets and liabilities, such as bank accounts or loans received, are recorded in the financial accounts as assets/liabilities of households; their real assets, such as buildings or machinery, are considered as part of households’ (real) wealth but are ignored in financial accounts. The standard is different for quasi-corporations. Since quasi-corporations are treated as separate entities, their assets and liabilities should be reported in the sector “nonfinancial corporations and quasi-corporations”; their total net worth should appear in the financial accounts both in the households sector, as an asset in the form of “shares and other equity”, and in the non-financial corporations sector, as the counterpart liability in the same financial instrument. However, assets and liabilities of quasi-corporations are usually difficult to estimate. Consequently, the value of equity in quasi-corporations appears to be missing in the financial accounts for many countries—including, so far, Italy; this means that households’ total assets and wealth are underestimated.

This paper explains the strategy that the Bank of Italy is developing for estimating the net worth of nonfinancial quasi-corporations,<sup>3</sup> in order to fill the gap in the financial accounts and in the statistics on households’ wealth. This strategy is mainly based on survey data from the Bank of Italy Survey on Household Income and Wealth (SHIW),

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<sup>1</sup> Sole proprietorships are defined in Italian law as “*ditte individuali*”. We use the term “unincorporated businesses” to mean “*ditte individuali*” plus all types of business partnerships, as defined by Italian law, where partners (or some of them) have unlimited liability: *società in nome collettivo*, *società in accomandita semplice*, *società semplici*, *società di fatto*. Certain types of unincorporated businesses (*società in nome collettivo*, *società in accomandita semplice*) are required to hold a complete set of accounts whereas others are not. None is required to publish accounts.

<sup>2</sup> In this paper we use the word “employee” as synonymous of “worker”. This usage is a bit loose, as the employer and his/her family may also count as workers in firm statistics even if they are not employees. The distinction can make a significant difference in micro-enterprises.

<sup>3</sup> In principle, a similar method could be used (with a number of caveats) also to estimate the net worth of micro-enterprises that do not qualify as quasi-corporations, i.e., for producer households. However this is not necessary, because the assets (and liabilities) of producer households can be estimated in other ways, on the basis of sources that are available for producer households but not for quasi-corporations (see Cannari, Faiella, Marchese, Neri, in this volume). Anyway, we plan to develop an application to producer households of the methods described here as a countercheck on other estimates.

which contains questions on households' equity holdings in all types of businesses. It also makes use of banking statistics and other financial statistics.

Using micro data on micro-enterprises for the estimation of macro statistics presents some difficult conceptual and practical problems. We discuss, among other things, issues of definition, the treatment of non-reporting behaviour, as well as the compatibility of estimated totals with independent macroeconomic information.

## 2. Background

Italy is a country of small firms. According to census data, the average number of employees of firms engaged in nonfinancial activities was 3.7 in 2001. About 4 million nonfinancial enterprises were actively operating in Italy in the same year, about 90 per cent of which had 5 employees or less. Enterprises with up to 5 employees accounted for nearly 40 per cent of total employment in nonfinancial businesses, thus representing a very significant share of economic activity. Figures have been evolving only very slowly over time, with the average number of employees increasing by 0.1 percentage point in four years, thus the most recent updates largely confirm this fact. Fully accounting for micro-enterprises in macroeconomic statistics, including financial statistics, is therefore very important. It is also a challenging task.

For financial and wealth accounts, it is not too difficult to account for small enterprises as long as they take the form of corporations. However, a large majority of micro-enterprises are constituted as sole proprietorships or some forms of unlimited partnership. About 3.4 million nonfinancial enterprises are unincorporated; virtually all unincorporated businesses are small. Legally, such entities are not required to publish their balance sheets or in many cases even to keep a separate set of accounts in any form. One way or the other, they escape statistical recording, hence their value is unknown and needs to be estimated.

Unincorporated businesses fall into two categories for the purposes of statistical classification. According to international recording standards as set out in ESA95, some of them are called "quasi-corporations" and are included in the non-financial corporations sector. Quasi-corporations are defined as organizations not having independent legal status, that keep a full set of accounts, and whose economic and financial behaviour is different from that of their owners. This is a rather general description and it has to be operationalised at the national level. In Italy, the operational definition of nonfinancial quasi-corporations includes all firms that take the more formal types of unlimited partnerships (*società in nome collettivo*, *società in accomandita semplice*) regardless of size; it also includes simpler partnerships (*società semplici*, *società di fatto*) and sole proprietorships (*ditte individuali*), provided they have more than five employees.<sup>4</sup> Enterprises falling within this category are assumed to possess the character of a quasi-corporation and are therefore to be recorded in the non-financial corporations sector. The rest (i.e., simple partnerships and sole proprietorships with up to five employees) are to be recorded in the producer households sub-sector.

This distinction makes a difference to financial accounts (FA), and more generally to macroeconomic statistics. In the case of producer-household firms, no separation is assumed to exist between the firm and its owner(s). Consequently, the financial assets and liabilities of such firms, such as bank accounts or loans received, are recorded in the FA as assets/liabilities of households. On the other hand the real assets of the same firms,

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<sup>4</sup> The 5-employee threshold is a national convention. Other countries may use different thresholds and/or criteria.

such as buildings or machinery, do not enter the financial accounts; they are considered as part of households' real wealth.

The standard is different for quasi-corporations. Quasi-corporations are treated as separate entities with respect to their owners. Their total net worth should therefore appear in the FA in the form of "shares and other equity", the financial instrument representing items associated with property rights on corporations and quasi-corporations. In line with double-entry accounting rules, this value has to be recorded twice: as an equity holding (asset) of the households sector, and as the counterpart liability of the non-financial corporations sector, i.e., as the net equity (or own funds) component of the liability side of the micro-enterprise's notional balance sheet. However, the value of the net equity of quasi-corporations is usually difficult to estimate, as its estimation presents some nontrivial conceptual and practical problems. Consequently, it appears to be missing in the published FA for many countries. At the moment, the value of quasi-corporations' equity is not recorded in Italian financial accounts.

In Italy, according to the national definition, quasi-corporations comprise nearly 850.000 firms, 77 per cent of which are "micro-enterprises" with up to five employees. These firms account for one third of total employees in the nonfinancial sector and are mainly engaged in trade and other services. Table 1 presents more data on the significance and distribution of these firms.

Table 1

### Quasi-corporations in Italy in 2001

Nonfinancial quasi-corporations	
Number .....	849,168
of which: with up to 5 employees .....	77.1%
Employees .....	3,465,301
Share of quasi-corporations in total for non-financial corporations and q-c	
Number of units .....	58.2%
Number of employees .....	29.0%
Value of output .....	22.1%

Source: Istat (Census data, ASIA archive, national accounts).

### 3. Methodology and results

How much are quasi-corporations worth? As we mentioned earlier, balance sheets of unlimited partnerships, as well as those of sole proprietorships, to the extent that they exist at all, are not publicly available. Therefore there is no direct information even on the order of magnitude of their value. In what follows we examine three independent methods for estimating this value, and suggest an overall strategy that combines two of them.

The first two methods are based on data from the Bank of Italy's Survey on Household Income and Wealth (SHIW),<sup>5</sup> which contains direct questions on the value of households' equity holdings in all types of businesses. The third method exploits information, available from supervisory statistics, about the financial debt of quasi-corporations towards the banking system, and makes an attempt to assess the value of quasi-corporations in an indirect manner.

<sup>5</sup> Banca d'Italia (2006).

All three methods involve consistency checks with available macroeconomic information. Each method has advantages and drawbacks; comparing estimates obtained using different sources and criteria gives the benefit of independent appraisals. It turns out that, for the year 2004, the range of estimates is quite small, which is an encouraging sign that reasonably reliable statistics may be compiled by making use of this information.

*Method 1: SHIW-based, net equity per enterprise.* In the Bank of Italy Survey on Household Income and Wealth, households are directly asked to give an estimate of the value of any enterprise(s) they own. Since the survey also contains information on the legal type and the number of employees of such enterprises, in principle it is possible to identify the subset  $QC$  of households whose firms qualify as quasi-corporations, based on the national definition explained above. The total value of quasi-corporation could then be estimated by using the following straightforward formula:

$$\text{Total value of quasi-corporations} = \sum_{i \in QC} VAL_i \cdot WGHT_i, \quad (1)$$

where  $VAL_i$  is the market value of quasi-corporations owned by household  $i$ , as declared by the same household, and  $WGHT_i$  is the population weight<sup>6</sup> of the household. In other words, once households owning a quasi-corporation are identified, the value of their firm is simply expanded to the population total.

However, not all households who declare ownership of a business specify its legal type, therefore it is likely that  $QC$  is in fact a subset of quasi-corporation owners, and that the estimator (1) has a downward bias. The evidence also points in this direction. The number of quasi-corporations actually reported in the SHIW, once expanded, is 44 per cent lower than the number of active quasi-corporations provided on a macro basis by the National Statistical Institute figures (ASIA archive). It is thus reasonable to assume that the total value of quasi-corporations is underestimated. Moreover, among those households that do declare the legal type of their firm, there are some who do not report the firm's value, which must be estimated.

Estimates have therefore to be adjusted for two types of item non-response:<sup>7</sup> non-reporting of the legal form and non-reporting of the value of the business. There are two ways to adjust the estimates for non-reporting of the legal form: (a) re-weighting the survey data to match the population totals by means of a post-stratification procedure, or (b) imputing omitted responses through hot-deck methods. Both procedures increase the variance of the estimates, but this is unavoidable. In this paper we use the second procedure.

Hot-deck imputation requires that a subset of eligible "donor" households be identified. "Donors" are households that (a) own a business, (b) did not specify the legal type of their business, but (c) did specify other features of that business (such as type of business, branch of economic activity and number of employees), which are similar to those of quasi-corporations identified for other households. Once a sub-sample of suitable records is selected, a number of donors is randomly drawn. Random draws are constrained to match the total number and the geographic composition of quasi-corporations resulting from macroeconomic data compiled by the National Institute of Statistics, Istat. In this way a new subset of households is defined,  $QC^* = QC \cup$

<sup>6</sup> The population weight is the inverse of the probability of inclusion for a given household in the sample. When it is applied to the whole survey, it reflects the sampling design and it reproduces the whole Italian population. See Faiella (2007).

<sup>7</sup> On non-reporting behaviour in the SHIW, see Cannari and D'Alessio (1993).



randomly drawn “donors”. Estimates adjusted for non-response can be obtained by replacing  $QC$  with  $QC^*$  in (1).

Concerning the second type of non-response, i.e., declared quasi-corporations with unreported value, we imputed a value given by a weighted average of the value of similar firms in SHIW, controlled for branch of activity and geographic location.

Table 2 reports the total estimated value of quasi-corporations before and after the adjustments. The estimate is about 108 billion euro before any correction. This rises to 167 billion after the first adjustment and to 187 billion after the second.

Table 2

**Method 1: estimates**  
(millions of euro)

Total value of quasi-corporations	2004	
Before any adjustment .....	107,800	
After adjustment for non-reporting of legal type .....	167,600	
After further adjustment for non-reporting of business value .....	187,800	
<i>Memorandum items: geographic distribution of firms</i>	Istat	SHIW
North .....	58.2%	58.8%
Centre.....	20.5%	17.4%
South .....	21.3%	22.8%

Source: SHIW, Istat (ASIA archive).

*Method 2: SHIW-based, net equity per employee.* As mentioned above, both hot-deck imputation and post-stratification increase the variance of the estimator (1). An alternative way to estimate the value of quasi-corporations by means of a more efficient estimator involves the so called “ratio estimation”.<sup>8</sup>

As in the previous exercise, the set of households declaring ownership of a quasi-corporation,  $QC$ , is selected from SHIW. Then the average net equity per employee is computed on  $QC$  by means of the following formula:

$$\left( \frac{\text{Net Equity}}{\text{Employees}} \right) = \frac{\sum_{i \in QC} VAL_i \cdot WGHT_i}{\sum_{i \in QC} EMPL_i \cdot WGHT_i} = \frac{\sum_{i \in QC} VAL_i \cdot WGHT_i}{\sum_{i \in QC} WGHT_i} \quad (2)$$

where  $EMPL_i$  is the number of employees in quasi-corporation  $i$ , and other variables are as in (1). Hence the estimated net equity to employees ratio (left hand side of the formula)

<sup>8</sup> Even though slightly biased, ratio estimation can be more accurate than number-raised estimation if the auxiliary variable is correlated with the variable of interest. Basically, the ratio estimator is in principle more efficient than the simple estimator (1) because its variance is lowered by the effect of the covariance between the numerator and the denominator. Furthermore, it does not require hot-deck imputation of missing data, as will shortly be explained.

is the ratio of two weighted averages: the weighted average value of quasi-corporations in the numerator and the weighted average of the number of employees in the denominator.

In this case we make no correction for unreported holdings of quasi-corporation. Indeed, unlike under Method 1, such a correction would only be necessary in case of selection bias, i.e., if unreported quasi-corporations had systematically larger or smaller net equity per employee than reported quasi-corporations. While this cannot be ruled out in principle, there is no obvious reason why they should, nor would there be an indication of the size or even direction of such a bias. On the other hand, computing the ratio on  $QC^*$  instead of  $QC$  would increase the variance of the estimator.

To check whether this procedure gives plausible results, we compute the ratio (2) separately for 5 size classes, and we compare the results with the same ratio for other types of firms for which the value of the ratio is known. For this purpose we choose unquoted corporations (which may be assumed to be somewhat closer in their financial structure to quasi-corporations than quoted corporations, so that such a comparison is meaningful). Table 3 reports evidence on net equity per employee.<sup>9</sup>

For all size classes, the ratio is similar in magnitude in unquoted corporations and quasi-corporations, but somewhat smaller in the latter. This seems reasonable; the choice of organising a firm as a corporation rather than an unlimited partnership, other things equal, is likely to be determined in part by the easier access to capital enjoyed by more structured entities; it is therefore to be expected that corporations should have on average a higher capital ratio than simpler partnerships of similar size.

Table 3

**Net equity per employee**  
(thousands of euro)

	Unquoted corporations	Quasi-corporations
<i>Firm size (employees)</i>		
1-5 .....	59	59
6-9 .....	43	37
10-30 .....	49	29
31-100 .....	64	31
>100 .....	134	n.a.
Average net equity per employee.....	94	54

Source: Bank of Italy, SHIW; CEBI/CERVED for unquoted corporations.

Having established the plausibility of the estimates based on (2), we proceed to estimate the total value of quasi-corporations by multiplying the average value of equity per employee in  $QC$  by the total number of employees of quasi-corporations given by macroeconomic sources (i.e., Istat's "ASIA" archive). The results are presented in Table 4. The estimate is very close to that given by Method 1, which is encouraging.

One caveat is however in order. While SHIW underestimates the number of quasi-corporations (as explained above under Method 1), it *overestimates* the number of workers that quasi-corporations employ, compared to the macro-total provided by Istat. In other words, those quasi-corporations that households in the SHIW do report in full are on average larger than the population mean in terms of number of employees. In principle, this is a further potential source of bias. We leave the investigation of this point to future research.

<sup>9</sup> We use Italian Central Balance Sheet Office (*Centrale dei Bilanci*) data. Balance sheet data do not actually report the number of employees. We estimate their number by means of total compensation per employee.

Table 4

**Method 2: estimates**  
(millions of euro)

	Quasi-corporations
Number of workers in quasi-corporations.....	3,533,670
Net equity per employee (*)	53.7
Net equity of quasi-corporations (Method 2).....	189,659
<i>Memorandum item:</i>	
Net equity of quasi-corporations (Method 1) .....	187,800

Source: Bank of Italy, SHIW ; (\*) Thousands of euro.

*Variance of SHIW-based estimators.* It is useful to get an idea of the sampling variability of the two estimators based on the SHIW by deriving standard errors of the estimators and confidence intervals around the point estimates. Following the procedure developed by Faiella and Gambacorta (2007), we use a set of 325 jack-knife replicates of the sampling design scheme to compute the variance for both the number-raised estimator of method 1 and the ratio-estimator of method 2.

The basic idea behind the jack-knife technique involves constructing a number of sub-samples (replicates) from the original sample by leaving out one observation at a time. The statistic of interest is computed for each replicate and then an estimate for the variance of the statistic can be derived. The main advantage provided by jack-knife with respect to alternative techniques, such as bootstrapping, is that it allows to build the new samples in a manner that is consistent with the sample design. Such a property is particularly desirable when the sampling design is not an equal probability one, as is the case of the SHIW.<sup>10</sup>

Our computations yield a standard error of  $\pm 24$  billion euro for method 1 and  $\pm 28$  billion for method 2. We used these values to build confidence intervals around the point estimates: with a 90 per cent confidence level, the true value should not fall outside a range of 143-235 billion euro (Figure 1); with 80 per cent the range is 154-225.

By jack-knifing we account for sample variability. However the adjustment for item non-response increases the total variance of the estimator used in Method 1. Specifically, the hot-deck procedure adds to the sampling variance of the estimator because of the random draw of “donors”. In order to account for this additional source of variability caused by the hot-deck procedure, we performed a Monte-Carlo simulation by iterating the process of estimation 1000 times. The outcome is reported below in Figure 2.

It turns out that the additional variability is not large. As the chart shows, most estimates are concentrated within a range of 175-195 billion euro, while their distance from the mean is on average 6 billion euro.

*Method 3. Banking data, equity/bank credit ratio.* Methods 1 and 2 both rely on SHIW data. SHIW is unique in providing direct information on the net worth of quasi-corporations; on the other hand such information may be biased, as the survey sample is designed to be representative of households, not firms owned by them. Indeed, as shown above, even estimating the number of quasi-corporations or their employees on the basis of SHIW alone would lead to biased results. In order to provide an independent check of them it is therefore useful to search for evidence, albeit indirect, that is based on totally different sources.

<sup>10</sup> For details on the sampling design of the SHIW see Faiella (2007).

Figure 1

**Confidence intervals around point-estimates**

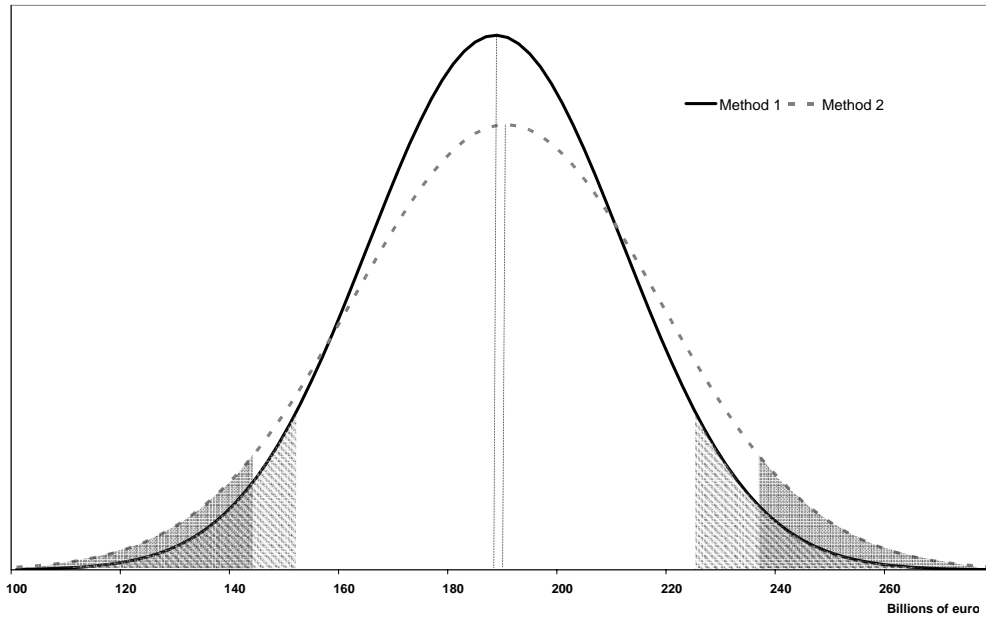
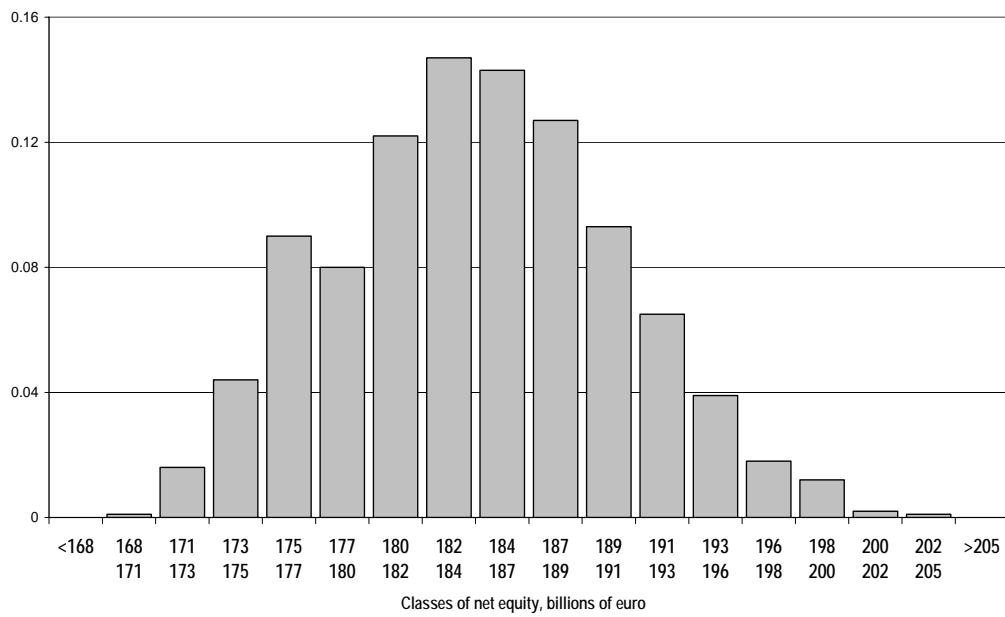


Figure 2

**Distribution of outcomes of 1000 iterations**



As banking supervisor, the Bank of Italy regularly collects a rich set of data from credit institutions. This includes information on bank credit broken down by counterparty (sub-)sector. Data on the debt of quasi-corporations towards (Italian-based<sup>11</sup>) banks is thus available.

The idea behind the third approach is to estimate the total value of equity for quasi-corporations from total bank credit, by assuming that the average ratio between the two (which we term, somewhat loosely, the “banking leverage ratio”) is the same for quasi-corporations as for some set of corporations that can be assumed to be reasonably similar to them, and for which data are available. Again, we choose unquoted corporations. Given that the average number of employees of quasi-corporations is 4, we compute the banking leverage ratio for unquoted corporations with 1-5 employees, based on balance-sheet data.<sup>12</sup> Then we compute:

$$\text{Total value of quasi-corporations} = \frac{\text{Banking debt of quasi-corporations}}{\text{Banking leverage}}, \quad (3)$$

Where *Banking leverage* is computed on small unquoted corporations, as was just explained.<sup>13</sup> As Table 5 shows, the point estimate (179 billion euro) is again very close to those of Methods 1 and 2.

Table 5

**Method 3: estimates**  
(millions of euro)

	2004
Banking debt of quasi-corporations .....	81,419
“Banking leverage ratio” .....	45.5%
Net equity of quasi-corporations (Method 3) .....	178,972
<i>Memorandum items:</i>	
Net equity of quasi-corporations (Method 1) .....	187,800
Net equity of quasi-corporations (Method 2) .....	189,659

Source: Bank of Italy, SHIW.

#### 4. Discussion and conclusions

As explained above on these pages, the value of micro-enterprises has not been included in financial accounts so far. Such omission introduces a bias in macroeconomic figures concerning the level of households net worth as well as the composition of their financial portfolios. Therefore it is desirable to fill the gap, even though the available statistical information is far from perfect.

We develop three methods for estimating the value of quasi-corporations. Although each has weaknesses, it is encouraging that the results obtained for the year 2004 fall within a rather narrow range of 180-190 billion euro. We feel therefore confident that reasonably reliable statistics may be compiled by making use of the available data.

<sup>11</sup> Given the nature of nonfinancial quasi-corporations it is unlikely that adding transactions with non-Italian banks would make any difference.

<sup>12</sup> Italian Central Balance Sheet Office (*Centrale dei Bilanci*).

<sup>13</sup> In fact we do not use the overall average leverage ratio of small corporations. We compute a weighted average of the banking leverage ratios of small scale (5 employees) broken down by branches of economic activity. Weights are inferred from the distribution of banking debts of quasi-corporations by branches of economic activities, available from supervisory statistics.

The issue is then which method is relatively more appropriate to derive a full time series to be included in the macroeconomic financial accounts. The main advantage of Methods 1 and 2 is that they rely on the only direct piece of information on the net worth of quasi-corporations that is available, namely SHIW. Moreover, if the macro estimate of net worth is based on survey microdata, then it is possible to make microeconomic analysis in a way that is consistent with macro aggregates. It is also possible, in principle, to derive estimates at various levels of disaggregation in a consistent way, though there is a limit in that the sample size of SHIW is too small to give reliable estimates for small subsets of corporations (e.g. by region, industry or size class).

The main weakness of Method 1 is that its results are suspect as SHIW underestimates the universe of quasi-corporations. Any correction for this (e.g., post-stratification or hot-deck imputation) increases the total variance of the estimator.

Method 2 is in principle just as efficient as Method 1 and it is also more transparent and easier to compute, as it does not require any special manipulation of the data. On the other hand, it also suffers from the limitations of SHIW as a sample of quasi-corporations. A point that is especially relevant to Method 2 is that SHIW overestimates the number of workers that quasi-corporations employ. Therefore the estimated net equity to employees ratio may well be biased, although even the direction of any bias is unclear. However, in ratio estimation, the size of the bias is proportional to the coefficient of variation of the denominator; as shown in Kish (1992), provided that the CV of the denominator is lower than 15 per cent, the ratio estimator should be unbiased. In this particular case, the CV of total number of employees in estimator (2) is 12 per cent, just below the mentioned threshold.

A common problem with SHIW-based methods is that SHIW is only available every two years. Therefore any estimates must be interpolated and updated in some way to serve as input to the financial accounts, which are compiled quarterly.

Method 3 is as simple to compute as Method 2, and it provides a useful independent check on the other two methods. It is also available at high frequency (quarterly). However, it relies on the strong assumption that the banking leverage ratio of quasi-corporations is equal to that of corporations with up to 5 employees. This assumption may not be unreasonable, but there is no direct evidence to corroborate it. Furthermore, while the indirect evidence provided by the comparison with SHIW-based estimates is surely welcome, it is worth noting that estimates based on Method 3 are rather sensitive to the exact definition of the reference set. To get an idea, changing the reference set to unquoted corporations with up to 10 employees (instead of 5) would increase the banking leverage ratio by 8 percentage points, from 45.5 to 53.5, and therefore shrink the estimate of the total net equity of quasi-corporations by 15 per cent (about 27 billion euro).

All in all, it seems reasonable to use a SHIW-based method as benchmark. Given that the estimator of Method 2 is potentially unbiased, just about as efficient and easier to compute than Method 1, Method 2 seems preferable. Method 3 can be employed as an auxiliary method for interpolation and extrapolation, as well as a way to cross-check the results.

Revising financial and wealth accounts to insert this estimate is going to result in significant changes in some important financial aggregates. The total amount of the instrument “shares and other equity” will increase by approximately 25 per cent. The value of households’ financial assets will increase by about 5-6 per cent and that of the non-financial corporations’ liabilities by 7-8 per cent. Households’ total wealth will increase by 2.7 per cent.

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## DISCUSSION OF THE PAPER BY M. L. RODANO AND L. F. SIGNORINI

*Richard Walton*\*

### 1. Review

1. The paper explains the strategy developed by the Bank of Italy to estimate the “shares and other equity”<sup>1</sup> of quasi-corporations. It addresses an important gap in Italian financial accounts, is methodologically sound (three methods) based on survey data from the Bank of Italy Survey on Household Income and Wealth (SHIW) and on banking data. Each of the methods is well thought through and given that all led to broadly similar results, the estimate seems to be rather robust. The paper is very clear and carefully written.

2. According to census data in Italy, about 3.4 million of non-financial enterprises (out of 4 million) are sole proprietorships or other unincorporated business. Virtually all are small (“micro-enterprises”). Such enterprises account for one half of employees in the non-financial sector and therefore represent a significant share of economic activity. However, the unavailability of direct statistical sources such as balance sheet data (not required by law) makes the measurement of their value a tricky task.

3. According to international statistical standards set out in ESA95, non-financial quasi-corporations (without independent legal status, keeping a complete set of accounts and having an economic and financial behaviour that is different from that of their owners) owned by households are grouped with non-financial corporations in the non-financial corporations sector. Sole proprietorships and partnerships without independent legal status – other than those treated as quasi-corporations which are market producers – are included in the Household sector. In Italy, the operational definition of non-financial quasi-corporations includes: i) formal types of unlimited partnerships, ii) simpler partnerships and iii) sole proprietorships provided they have more than five employees (national convention). Sole proprietorships with up to 5 employees are recorded in the Household sector.

4. The paper focuses on the value of “shares and other equity” of non-financial quasi-corporations which appears in the financial accounts, both in the household sector (as an asset in “shares and other equity”) and in the non-financial corporations sector (as the counterpart liability “net equity or own funds”). However, assets and liabilities of quasi-corporations are difficult to estimate and this component of equity appears to be missing in most countries’ published data (at present the value of quasi-corporation equity is not recorded in the Italian financial accounts). This means that households’ total assets and wealth are underestimated and there is a bias in the composition of their financial portfolios.

5. In order to fill the gap (no balance sheets are available) for Italy, the Authors review three independent methods for estimating the net worth of non-financial quasi-corporations. Two methods are on the basis of data from the SHIW which contains direct questions on households’ equity holdings in all types of businesses and the third method

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<sup>1</sup> The net worth of quasi-corporations is set by construction to zero, because the value of the owners’ equity is assumed to be equal to its assets less its liabilities. The term net worth (total assets minus total liabilities including shares and other equity) is not appropriate as the other equity of quasi-corporations is valued as their own funds (total assets minus liabilities excluding shares and other equity).

uses supervisory data provided by banks, in regard to the financial debt of quasi-corporations. The third method is based on banking data and provides a useful independent check on the other two methods; it is also available at a quarterly frequency. All three methods involve consistency checks with available macroeconomic information.

6. The authors acknowledge that a common problem with SHIW-based methods is that the SHIW is available only every two years which means estimates must be interpolated to be used as input to (quarterly) financial accounts. The first method identifies the total value by taking – as the reference population – those households who own quasi-corporations; but there is evidence of underestimation of the number and value of quasi-corporations. The second method computes average net equity per employee for the set of households declaring ownership of quasi corporations. The third method computes the banking leverage ratio for unquoted corporations with 1-5 employees.

7. The range of estimates – for 2004 – produced by the three methods is similar, an encouragement for the Authors to benchmark the methodology chosen (Method 2) for regular estimates of the total value of non-financial quasi-corporations. Using this benchmark the authors estimate that the value of “shares and other equity” will increase by 25 per cent; the value of households’ financial assets would be revised upwards by 5-6 per cent and the value of non-financial sector liabilities, by 7-8 per cent. Households’ total wealth will increase by 2.7 per cent.

## **2. Comments**

The paper uses sound methodology. Each method was well thought-through.

All three methods involve consistency checks with available macroeconomic information. All produce a very narrow range of estimates. Two methods are based on the SHIW. The third method is based on banking data and provides a useful independent check on the other two methods; it is also available at a quarterly frequency.

All three methods lead to broadly similar results. The range of estimates – for 2004 – produced by the three methods is similar, an encouragement for the Authors to benchmark the methodology chosen (Method 2) for regular estimates of the total value of non-financial quasi-corporations.

## **3. Using household survey data for macroeconomic statistics: challenges and pre-conditions**

The first challenge is that the SHIW should provide for a high consistency, in terms of definitions and reference period. The measurement of the value of wealth in business owned (or managed) by households is dependent on clear and comparable definitions and on the data collection from surveys. National accounts should provide the main and natural benchmark definitions for producing harmonised statistics based on surveys.

The second main challenge relates to the consistency of definitions between micro-economic analysis and macro aggregates. Survey methodology (underlying concepts and definitions) should therefore be consistent with the corresponding macro definitions. This is an important pre-condition for the use of micro data.

The institutional classification of quasi corporations in sector accounts is also an important issue. The definition of the household sector is very heterogeneous even across European countries. Work on harmonising national definitions is to be encouraged. The Italian Financial accounts practice to include partnerships and sole proprietorships with 5 or more employees in the NFC (S.11) sector is roughly in line with what other countries

are doing. Other countries also use, in addition to the criteria recommended by ESA, size criteria based on number of employees.

A further pre-condition is the correction for under-estimation. There is evidence in the comparison between the macro (financial accounts and balance sheets) and micro (SHIW) figures that households reporting in the SHIW may be reluctant to report entirely truthfully their sources of income or the financial assets they hold. The authors correct for this under-estimation. Concerning possible measures to cope with low participation rates and under/non-reporting, I think the answer to these questions is rather standard. Participation can only be improved if much attention is paid to how to establish initial contacts with the household. From existing surveys, the ECB has learnt that different packages of information may help a lot to convince respondents about the usefulness of the survey. Typical measures include sending: i) illustrative material by post, ii) personalised letters describing the use of the results, iii) official statements proving central bank's patronage and involvement (e.g. a letter from the NCB governor) and iv) incentives in the form of either money or donations to charity, symbolic tokens, etc.

The assumption that the main source of finance is banks in Italy appears reasonable. Regarding the banking data method, the crucial assumption is that the banking leverage ratio is indeed the same for small corporations and for micro-enterprises. One suggestion is whether the Bank of Italy could make a survey with a small set of banks to see whether the assumption holds or is there any other country where this information is available? In either case, some kind of further cross-check would be reassuring.

A further cross-check for the SHIW based methods could be to make the same exercise for earlier "waves" of the survey.

What is the feasibility of other data sources? Does the national accounts data compilation on quasi-corporations by Istat provide data on non-financial and financial assets and on transactions data for capital injections, payment of dividends, pre-tax profits, taxes, etc? Are direct surveys of quasi-corporations feasible? These alternative sources could provide further "checks and balances" for the existing data sources?

Developing quarterly estimates – based on the banking data – of financial assets and liabilities incurred in the name of the enterprise could fill gaps in data as a result of i) new quasi-corporations which are set up, ii) more capital injected into existing enterprises, iii) withdrawals of equity, etc. and also provide a timely data source in which to interpolate and extrapolate the benchmark data collected from the SHIW



## **WEALTH AND ECONOMIC ANALYSIS**

*Chairman: Luigi Spaventa, University of Rome “La Sapienza”*



## COMPARING WEALTH DISTRIBUTION ACROSS RICH COUNTRIES: FIRST RESULTS FROM THE LUXEMBOURG WEALTH STUDY

*Eva Sierminska\**, *Andrea Brandolini\*\** and *Timothy M. Smeeding\*\*\**

### 1. Introduction

The study of the distribution and composition of household wealth is a flourishing research field. Empirical analysis must, however, cope with considerable weaknesses in the available data. Household surveys of assets and debts, for instance, typically suffer from large sampling errors due to the high skewness of the wealth distribution as well as from serious non-sampling errors. In comparative analysis these problems are compounded by differences in the methods and definitions used in various countries. Indeed, in introducing a collection of essays on household portfolios in five countries, Guiso, Haliassos and Jappelli mention “definitions” as the “initial problem” and warn the reader that “the special features and problems of each survey ... should be kept in mind when trying to compare data across countries” (2002, pp. 6-7). Likewise, Davies and Shorrocks conclude their extensive survey on the distribution of wealth by remarking that: “Adoption of a common framework in different countries, along the lines that have been developed for income distributions, would improve the scope for comparative studies” (2000, p. 666).

The contrast with income is an apt one. By now, also thanks to the endeavor of the Luxembourg Income Study (LIS), we have a good idea of the income inequality ranking of OECD countries (e.g., Brandolini and Smeeding, 2007; 2008). At the turn of the century, income inequality was least in Nordic countries. The Benelux countries, France, Germany and other Central and Eastern European countries came next, preceding most Anglo-Saxon nations and the Southern European countries. The United States, Estonia, Mexico and Russia exhibited the highest degree of inequality. While we can draw this income inequality picture with some confidence, our knowledge is far more uncertain on the country ordering in terms of wealth inequality. A recent compilation of data for nine nations around the beginning of this decade shows that Sweden, not the United States, leads the ranking (Brandolini, 2006, Figure 2, p. 48). This evidence not only runs counter to that based on income, but also to earlier evidence. According to the figures assembled by Davies and Shorrocks (2000, Table 1, p. 637) for 11 nations, in the mid 1980s wealth inequality was among the lowest in Sweden and greatest in the United States. Does this different ranking reflect true changes during the 1990s, or are we reacting to some statistical artifact? If one leans toward the latter explanation, we might turn to the results obtained by Klevmarken, Lupton and Stafford (2003), showing the much higher inequality of the U.S. wealth distribution in the 1980s and 1990s.<sup>1</sup> This is a clear warning that before making cross-country comparisons and investigating the causes of different patterns, we must carefully understand the extent to which data are comparable.

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\* CEPS/INSTEAD, Luxembourg. \*\* Bank of Italy. \*\*\* Syracuse University. Eva Sierminska is the LWS project coordinator, Andrea Brandolini and Timothy Smeeding the LWS project leaders. Further information on the LWS project is available at [www.lisproject.org/lws.htm](http://www.lisproject.org/lws.htm). We are very grateful to all sponsoring institutions and participants in the LWS project. We thank Markus Säylä and Ulf von Kalckreuth for providing us with unpublished data for Finland and Germany, respectively.

<sup>1</sup> Klevmarken (2006, pp. 30-31) reports that, in 2003, the inequality of net worth was in Sweden somewhat below the average, and lower than in France, Germany and Italy, according to the evidence of the Survey of Health Ageing and Retirement in Europe (SHARE) – an international project for the collection of data standardised from the outset on the living conditions and health status of the households with at least one member aged 50 and more.

These and similar questions have led researchers and institutions from a number of countries to join forces to launch the Luxembourg Wealth Study (LWS) – an international project to assemble existing micro-data on household wealth into a coherent database. As the LIS experience has clearly shown, the availability of such database is likely to spur comparative research on household net worth, portfolio composition, and wealth distributions, and to stimulate a process of harmonization of definitions and methodologies. The purpose of this paper is to sketch the main features of the project and to present the first preliminary results, in order to show the potential of the LWS database. While we take full responsibility of what is written here, it is important to recognize from the outset that we owe a great debt to all sponsoring institutions and participants in the LWS project. In a sense, this paper is a collective effort much more than is revealed by the names of the authors of this paper alone.

The paper is organized as follows. The next Section describes the genesis and structure of the project. Sections 3 to 5 summarize the main features of data sources and discuss the classification of wealth variables and some comparability issues. Preliminary results from the  $\beta$ -version (test version) of the LWS database are discussed in Section 6. Section 7 concludes.

## **2. Genesis, goals and participants**

The idea of the Luxembourg Wealth Study originated at the 27th General Conference of the International Association for Research in Income and Wealth, held in Djurhamn, Sweden in August 2002. Following the discussion in a session on the size distribution of wealth, it was apparent that data on household net worth were far behind those on income in terms of international comparability. It was then recognized that the time was ripe for the creation of a cross-country comparable wealth database. The LIS successful experience, begun almost two decades earlier (Smeeding, 2004), suggested the way forward: a cooperative project gathering producers of wealth micro-data in countries where these data were available. After two more meetings of wealth and data collection experts in 2003, one at LIS offices in Luxembourg in July and one at the Levy Economics Institute in New York in October, the LWS was officially launched in March 2004 as a joint project of LIS and institutions from nine countries: Canada, Cyprus, Finland, Germany, Italy, Norway, Sweden, the United Kingdom, and the United States. Austria has also joined in spring 2006, making LWS a ten nation enterprise at present.

The primary goal of the project is to assemble and to organize existing micro-data on household wealth into a coherent database, in order to provide a much more sound basis for comparative research on household net worth, portfolio composition, and wealth distributions. The ex post harmonization of existing data is seen as the first stage of the project. The establishment of a network of producers and experts of data on household net worth aims at promoting a process of ex ante standardization of definitions and methodologies. The elaboration of guidelines for the collection of household wealth statistics, as done for income by the Expert Group on Household Income Statistics–The Canberra Group (2001), is an important task for the foreseeable future. In light of these goals the first workshop on the “Construction and Usage of Comparable Microdata on Wealth: the Luxembourg Wealth Study” was organized by Banca d’Italia in Perugia, Italy in January, 2005. The outcome of this conference was a series of technical papers available on the LWS website, which provide the basis for future discussions in constructing comparable wealth survey data (see Banca d’Italia, 2008).

Participants in the LWS project are a varied group. Sponsoring institutions include statistical offices (Statistics Canada, Statistics Norway), central banks (Central Bank of



Cyprus, Banca d'Italia, Österreichische Nationalbank), research institutes (Deutsches Institut für Wirtschaftsforschung - DIW, U.K. Institute for Social and Economic Research - ISER, through a grant awarded by the Nuffield Foundation), universities (Åbo Akademi University), and research foundations (Finnish Yrjö Jahnesson Foundation, Palkansaajasäätiö - Finnish Labour Foundation, Swedish Council for Working Life and Social Research - FAS, U.S. National Science Foundation). Representatives from several other public institutions (Statistics Sweden, Banco de España, De Nederlandsche Bank, U.S. Federal Reserve Board, U.S. Internal Revenue Service, U.K. Department for Work and Pensions, Organisation for Economic Co-operation and Development, World Bank) as well as researchers from many universities have taken part in different stages of the project.

The partnership with the LIS is a strong asset, as it allows the LWS project to take advantage of the 20-year LIS experience in harmonizing household survey data and making them accessible to researchers world-wide through an innovative remote access system (see [www.lisproject.org](http://www.lisproject.org) for further details). The same access rules will be followed by the LWS. The  $\beta$ -version (test version) of the database has been released and is being tested by researchers participating in the project. The comparison of the  $\beta$ -version of the database with the original national sources will be the object of a technical workshop planned for December 2006. The test phase will lead to the preparation of the final  $\alpha$ -version of the database that is expected to be made public at the end of 2007. The release of the  $\alpha$ -version to the research community will mark the end of the first stage of the LWS project. Afterwards, the maintenance and updating of the dataset will be part of the regular LIS activities, as decided by the board of LIS country members in July 2005 and to be discussed again in July 2007. As for LIS, participation in the LWS work will be open to any country that has the relevant information and wants to join the project.<sup>2</sup>

### **3. A sketch of data sources**

The data sources included in the LWS database and some of their characteristics are listed in Table 1. The Austrian survey is covered here for sake of completeness but no further comments will be made in the paper, as the work to include this survey in the LWS database has not been completed yet. Although all countries rely on sample surveys among households or individuals, there are differences in collection methods across surveys. For example, in two Nordic countries the data are supplemented with information from administrative records (mostly wealth tax registers). Some income information is also supplemented by tax registers in Canada and Finland. Sample sizes are widely different, ranging from 895 households in Cyprus to 22,870 units in Norway.

The surveys also differ by purpose and sampling frame (see Sierminska, 2008, for further details). Certain surveys have been designed for the specific purpose of collecting wealth data (CA-SFS, CY-SCF, IT-SHIW, US-SCF), whereas others cover different areas and have been supplemented with special wealth modules of longitudinal household panel surveys (GE-SOEP, UK-BHPS, US-PSID). Some surveys over-sample the wealthy and provide a better coverage of the upper tail of the distribution (CA-SFS, CY-SCF, GE-SOEP, US-SCF), but at the cost of higher non-response rates. Others ask only a small number of broad wealth questions, but achieve good response rates (e.g., US-PSID). Germany applies a special case of "bottom-coding," because financial assets, durables

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<sup>2</sup> Participation in the LWS project has already been discussed with the Netherlands, New Zealand, Spain, and other similar nations.

and collectibles, and non-housing debt are only recorded when their respective values exceed 2,500 euros. Tax registers may contain more precise estimates, but they suffer from under-reporting due to tax evasion and tax exemptions, or to valuation criteria based on fiscal or administrative rules rather than market prices (see below).

Definitions are also not uniform across surveys. In general, the *unit of analysis* is the household, but it is the individual in Germany, and the nuclear family (i.e. a single adult or a couple plus dependent children) in Canada. A household is defined as including all persons living together in the same dwelling, but sharing expenses is an additional requirement in Cyprus, Italy, Finland, Norway, Sweden and the United States. This implies that demographic differences reflect both the definition of the unit of analysis and true differences in the population structure.

The *household's head* is defined as the main income earner in most surveys, but it is defined as the person most knowledgeable and responsible for household finances in Germany, Italy and the United Kingdom. The United States is the only country where the head is taken to be the male in a mixed-sex couple. Multiple household's heads are allowed in Norway wherever the partners in a couple are not married or cohabiting, or adult children are present, since the head is defined with reference to each nuclear family within the household. As in the LWS database the unit is taken to be the household, in these cases the household's head has been identified with the main income earner.

The surveys included in the LWS archive differ in many other respects, and some more closely related to wealth variables are discussed in the next Section. Full documentation of each survey's features will be an important constituent of the LWS archive. The LWS documentation will also report which of these differences in the original surveys were corrected for in the harmonization process, and which were not.

#### **4. LWS variables and wealth classification**

The number and definition of recorded wealth variables vary considerably across surveys. As shown in Table 1, the number of wealth categories ranges from a minimum of 7 in the UK-BHPS to 30 or more in the IT-SHIW, the NO-IDS and the US-SCF. This number compounds with the detail of the questions: in some surveys, there are few simple summary questions; in other surveys, the very high level of detail leads to a considerable multiplication of the number of separate recorded items. The US-SCF is by far the most detailed wealth survey of those included in the LWS database: checking accounts, for instance, are first separated into primary and secondary accounts, and then distinguished according to the type of bank where they are held.

The great variation in the amount of recorded information makes the construction of comparable wealth aggregates a daunting task. This problem has been approached by defining an ideal set of variables to be included in the LWS database. This starts with a general classification of wealth components, from which totals and subtotals are obtained by aggregation. This set is then integrated with demographic characteristics (including health status) and income and consumption aggregates, plus a group of variables particularly relevant in the study of household wealth: realized lump-sum incomes (e.g., capital gains, inheritances and *inter-vivo* transfers) and "behavioral" variables such as motives for savings, perceptions about future events (e.g., bequest motivation), attitude towards risk, and so forth.

This ideal list has been pared down after a comparison with the information actually available in the LWS surveys. With regards to wealth, this process has eventually led to identify the following categories:

- *Financial assets*: Transaction and savings accounts, CDs; Total bonds; Stocks; Mutual and investment funds; Life insurance; Pension assets; Other financial assets.
- *Non-financial assets*: Principal residence, Investment real estate; Business equity; Vehicles; Durables and collectibles; Other non-financial assets.
- *Liabilities*: Home secured debt, which is the sum of Principal residence mortgage, Other property mortgage, and Other home secured debt (including lines of credit); Vehicle loans; Installment debt (including credit card balance); Educational loans; Other loans from financial institutions; Informal debt.
- *Net worth*: Financial assets plus Non-financial assets less Liabilities.

Crossing this classificatory grid with the information available in each LWS survey gives rise to the matrix of Table 2. This table illustrates the difficulty of transforming the original sources into a harmonized database: coverage and aggregation of wealth items vary widely across surveys. An acceptable degree of comparability can be obtained for four main categories of financial assets: deposit accounts, bonds, stocks, and mutual funds – with the partial exception of Germany which does not record information on checking deposits. The remaining financial components are available only for some countries. For non-financial assets the greatest comparability is obtained for principal residence and investment real estate. Liabilities are present in all surveys, though with a varying degree of detail. Applying the minimum common denominator criterion to this matrix, the following four LWS aggregates are defined: total financial assets, including deposit accounts, stocks, bonds, and mutual funds; non-financial assets, including principal residence and investment real estate; total debt; and net worth, i.e. the sum of financial and non-financial assets net of total debt. Business equity is not available for all nations, but is comparable for at least seven nations. If one is willing to focus on a smaller subset of nations, more complete definitions are possible.

These LWS aggregates, on which we focus in the next Sections, are broadly comparable, but fall far short of perfect comparability, since underlying definitions and methods vary across surveys. Moreover, these aggregates fail to capture important wealth components, such as business equity and pension assets. As their importance differs across countries, cross-national comparisons are bound to reflect these omissions. Some indication is provided by the comparison between the LWS definitions and the national definitions of net worth. The LWS database includes the variables which are part of the national concept but are excluded from the LWS definition. This allows users to reconcile the different definitions, as shown in Table 3 for five countries. The first message of Table 3 is reassuring: once the missing items are included back in net worth, the LWS figures closely approximate those released in official publications. On the other hand, more worryingly, the weight of these omissions is significant and varies considerably across countries: it goes from about a half in the two North-American nations to less than a fourth in the three European nations of Table 3. This evidence is a salutary warning of the currently high cost of cross-country comparability using current survey practices: until a greater standardization of wealth surveys is achieved *ex ante*, we have to trade off higher comparability against a somewhat incomplete picture of national wealth.

## 5. Further comparability issues

Other methodological differences, in addition to those concerning definitions, affect comparability. Some relate to the way assets and liabilities are recorded (as point values, by brackets, or both) and to their accounting period. Wealth values generally refer

to the time of the interview, but in four countries end-of-year values are registered (Table 1). Moreover, in half of the surveys included in the LWS database the reference period for income differs from that for wealth.

The criteria to value assets and liabilities may differ too (see Atkinson and Harrison, 1978, pp. 5-6). In most cases, wealth components are valued on a “realization” basis, or “the value obtained in a sale on the open market at the date in question” (Atkinson and Harrison, 1978, p. 5), as estimated by the respondent. But there are important exceptions, the most relevant being the valuation of real property in Sweden and Norway on a taxable basis. Statistics Sweden calculates the ratios of purchase price to tax value for several types of real estate and geographical locations, and then use them to inflate the tax values registered in the survey. This procedure is however not applied to Norwegian data, although Statistics Norway estimated that in the 1990s the taxable value of houses was less than a third of their market value (see Harding, Solheim and Benedictow, 2004, pp. 15-6, fn. 10). These diverse choices are likely to affect comparisons between the two Scandinavian countries as well as between them and the other countries relying on valuation at market prices as estimated by respondents.

Lastly, there are different patterns of non-response and different imputation procedures. For instance, the CY-SCF has a rather detailed set of questions, but the number of missing values is very high: only 349 households, out of 895, provided enough information to estimate the LWS net worth concept (Table 4). The overall response rate of the IT-SHIW is rather low, about 36 per cent in the 2002 wave, net of units not found at the available address, but item non-responses are few. LWS net worth cannot be derived for 14 per cent of the households in the UK-BHPS. Banks, Smith and Wakefield (2002) have applied a “conditional hot-deck” imputation method at the benefit unit level to alleviate the missing information problem, but it is still to be determined whether LWS will follow the same methodology. In the US-PSID financial assets as well as housing equity are imputed. Discussions are under way whether this imputation method can be followed to obtain values for the principal residence and mortgages that would reduce the overall proportion of missing values. In the US-SCF item non response is tackled by using a sophisticated multiple imputation program (Kennickell, 2000), while in the GE-SOEP it is currently treated by simply replacing missing values with the overall mean (a complex imputation procedure is under study).

A synthetic assessment of the information contained in the LWS database is provided by the comparison of LWS-based estimates with their aggregate counterparts in the national balance sheets of the household sector (which include non-profit institutions serving households and small unincorporated enterprises). This comparison is presented in Table 5, where all variables are transformed into euro at current prices by using the average market exchange rate in the relevant year, and are expressed in per capita terms to adjust for the different household size. The aggregate accounts provide a natural benchmark to assess the quality of the LWS database, but a proper comparison would require a painstaking work of reconciliation of the two sources, as discussed at length by Antoniewicz *et al.* (2008). The aim of Table 5 is more modestly to offer a summary view of how the picture drawn on the basis of the LWS data relate to the one that could be derived from the national balance sheets or the financial accounts. LWS estimates seem to represent non-financial assets and, to a lesser extent, liabilities better than financial assets. In all countries where the aggregate information is available, the LWS wealth data account for between 40 and 60 per cent of the aggregate wealth. Note that these discrepancies should not be attributed to the deficiency of the LWS data, since they reflect not only the under-reporting in the original micro sources, but also the dropping of some items in the LWS definitions to enhance cross-country comparability as well as the different definitions of micro and macro sources.

To sum up, despite the considerable effort put into standardizing wealth variables, there remain important differences in definitions, valuation criteria and survey quality that cannot be adjusted for at this time. Moreover, the degree to which LWS-based estimates match aggregate figures varies across surveys. These observations have to be borne in mind in reading the results discussed in the next Section.

## **6. First results from the LWS database**

In this Section we present some descriptive evidence on household wealth for the nine countries included in the  $\beta$ -version of the LWS database. We focus on asset and debt participation, portfolio composition, and the distribution of net worth. As wealth accumulation patterns vary over the life-cycle, it is useful to portray the demographic structure in each country before reviewing this evidence (Table 6). The average household size ranges from 1.96 persons in Sweden to 2.65 in Italy and 3.35 in Cyprus. Italy stands out as the country with the most pronounced ageing process. On average, the age of household's heads is 55 years in Italy, against 53 in the United Kingdom, 52 in Germany and 51 in Sweden; in all other countries, mean age is below 50, with a minimum 47 in Canada. Italy has both the lowest share of young household's heads (below 35 years) and the highest share of old heads (more than 64 years): 10 and 33 per cent, respectively. The United Kingdom and Germany follow at some distance. At the other extreme, 18 per cent of the Canadian households are headed by an old person, and 27 per cent of households in Norway are headed by a young one. In other countries, old household's head account for around 21-22 per cent of the total and young heads for about 23-24 per cent.

### *6.1 Asset and debt participation and portfolio composition*

Table 7 shows that in almost all LWS countries, over 80 per cent of households own some financial asset. In most countries this is a deposit account. Stocks are particularly spread in Cyprus, Finland and Sweden. Sweden and Norway have the highest diffusion of mutual funds. 44 per cent of Cypriot households hold bonds. In the United States, according to the SCF, holders of stocks, bonds and mutual funds each account for about a fifth of the population. Over 60 per cent of households own their principal residence in all countries except in Germany and Sweden: the proportion is highest in Cyprus (74 per cent), and it falls just below 70 per cent in Italy, the United Kingdom and the United States (SCF). Owning a second home is most popular in Finland and Norway. There is substantial variation in debt holdings: from 22 per cent of households in Italy to 80 in Norway; from 10 per cent in Italy to 46 in the United States if only home secured debt is considered.

As noticed above, most of financial assets and non-housing debt are recorded in Germany only if they exceed 2,500 euros. The figures in the bottom panel of Table 7 are obtained by applying the same bottom coding to the data for six other countries, in order to put them on a comparable basis with the German data (something which LWS flexibility allows the user to accomplish). The share of households owning financial assets is now in Canada and Finland similar to the German one; it is 20 percentage points higher in Italy and Norway, with the two Anglo-Saxon countries in an intermediate position. The comparison between the top and bottom panel of the Table indicates that a large proportion of Canadian and Finnish households holds very little in reported financial assets.

One of the advancements allowed by the availability of the LWS database is, however, in the demonstration of different patterns of comparative wealth holding among households. The age profiles for the possession of financial assets, principal residence, debt and positive net worth are significantly different across countries (Figure 1). Italy, again, stands out as an outlier. On the one hand, intergenerational differences appear to be dissimilar, since the hump-shape of debt-holding and home-ownership is much flatter than in the other countries. On the other hand, the low propensity to borrow and the parallel high proportion of positive net worth holders, already noted for the average, are common across all age classes. Norway and Finland show a remarkable diffusion of financial wealth in all cohorts, including the young. In Germany and Sweden the share of home-owners tends to be lower than in other countries, and it is markedly so among the elderly.

Table 8 shows a considerable variance in portfolio composition.<sup>3</sup> The United States exhibits the highest preference for financial assets: around 35 per cent of total assets, over two thirds of which are held in risky instruments like stocks and mutual funds. Sweden and Canada follow, with proportions of 28 and 22 per cent, respectively. Financial instruments account for only 15-16 per cent of total assets in Finland and Italy. The principal residence represents 60 per cent or more of the value of total assets in all countries except the United States, where it accounts for close to 50 per cent. The ratio of debt to total assets ranges from a very low 4 per cent in Italy to 35 per cent in Sweden. Comparing the household portfolio composition as measured in the LWS database with the composition emerging from aggregate data is an important topic for future research.

## 6.2 *The distribution of net worth: means, medians and inequality*

Figure 2 indicates that country ranking differs between net worth and income, and also that it matters which measure of central tendency of the wealth distribution is chosen: mean or median. All values are expressed in international 2002 U.S. dollars by using the purchasing power parities and consumer price indices estimated by the OECD. Both with the mean and the median income, the United States is the richest country followed by Canada and the United Kingdom, then Germany and Sweden, and lastly Finland and Italy. This is not the case for net worth. The United States and Italy are the richest nations according to mean net worth, and Sweden and Finland are the poorest ones. Once we switch to the median, the United States fall toward the middle and are surpassed by Finland and the United Kingdom. Italy and the United Kingdom show by far the highest median net worth, almost twice the corresponding values for the other countries.

Median wealth holdings by age of the household's head in Figure 3 exhibit a similar hump-shaped pattern, although at different levels of net worth, in most countries. The young have less, the middle aged have the most, and the older have less than the middle-aged but more than the young. The richest young are found in Cyprus and Italy, but their share in population is small, suggesting that only those with enough wealth leave their parents' house (see also Martins and Villanueva, 2006, Table 1). In the United States, Canada, the United Kingdom and Italy the older headed households are also quite well-off. The patterns for financial assets are quite varied for those aged 50 and over. In all countries, the young have little debt, while those aged 35-44 are the most indebted.

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<sup>3</sup> Note that figures are not reported for Cyprus, owing to the many missing values, and for Norway because of the inconsistency stemming from valuing real estate on a taxable basis and debt at market prices. Also, the German data are biased by the fact that small holdings of some financial assets and debt are not recorded.

Unsurprisingly, indebtedness is low among the older age classes: indeed, over half of the elderly have no debt in all countries. In Germany and Italy, over half of the households have no debt at all ages.

The LWS database allows us to shed new light on international differences in wealth concentration. There are very few international comparisons of wealth distribution based on micro-data reclassified to account for differences in definitions. Kessler and Wolff (1991), Klevmarcken, Lupton and Stafford (2003) and Faiella and Neri (2004) are among the few examples of bilateral comparisons but, to our knowledge, the LWS project is the first attempt to extend such comparisons to more than two countries. Table 9 shows statistics on the distribution of net worth in seven countries. The caveats exposed in previous Sections must be borne in mind: in particular, the bottom-coding implemented in the German survey is likely to overstate measured inequality. According to the  $\beta$ -version of the LWS database, the highest Gini index is found in Sweden. The United States closely follow, and Germany and Canada come next. Finland, the United Kingdom and Italy exhibit a more equal distribution of net worth. Hence, also the LWS data put Sweden at the top of the ranking. In accounting terms, part of the explanation rests on the very high proportion of Swedish households with nil or negative net worth: 32 per cent against 23 per cent, at most, in the other countries (excluding Germany, whose figure is probably overstated by bottom-coding). When the share of net worth held by top population percentiles is considered, the United States regain the lead: the richest one per cent of U.S. households controls 33 per cent of total wealth, according to the SCF, or 25, according to the PSID, and the next four per cent controls another 25 per cent.<sup>4</sup> These proportions are far higher than in all other countries, Sweden included. Understanding the extent to which these results are affected by the different measurement methods or the different comprehensiveness of the wealth definition is an important question left for future LWS research. For instance, counting pension rights as an asset might matter more for Sweden, resulting in much greater equality than found in the figures of Table 9.<sup>5</sup>

## 7. Conclusions

Reliable statistics on the composition and distribution of private wealth is a prerequisite for the study of the well-being of households and their consumption and financial behavior. As stressed by John Campbell in his Presidential Address to the American Finance Association in 2006, “measurement” is a “challenge” faced by researchers studying household finance:

“Positive household finance asks how households actually invest. *While this is a conceptually straightforward question, it is hard to answer because the necessary data are hard to obtain.* One reason is that households tend to guard their financial privacy jealously: Indeed, it may be more unusual today for people to reveal intimate details of their financial affairs than to reveal details of their intimate affairs. In addition, many households have complicated finances, with multiple accounts at different financial institutions that have different tax status and include both mutual funds and individual stocks and bonds. Even households that wish to provide data may have some difficulty answering detailed questions accurately.” (2006, p. 1555, italics added).

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<sup>4</sup> The over-sampling of the wealthy in the US-SCF but not in the US-PSID is a plausible reason for the difference in the estimated shares of the richest households.

<sup>5</sup> On measuring pension wealth see Brugiavini, Maser and Sundén (2008).

The challenge of measurement is stretched to the limit when we move to comparative analysis, since the difficulties in collecting data on household finances are compounded by the need to standardize these data across countries. Yet, the exercise is very well worth taking.

In the first place, in a number of countries there are enough data which, once they are properly treated, could shed light on cross-national differences in household finances. The detailed work on the single items recorded in each of the surveys included in the LWS database has allowed us to construct a set of variables and wealth aggregates which are broadly comparable across countries. Researchers must be aware that many problems remain and that comparative results must be taken with some caution. But the LWS project has shown that cross-national analysis of household wealth holding is indeed feasible. This paper has only given a flavor of the variance of wealth patterns across countries and raised further research questions. Why is indebtedness so low among Italians and Germans at all ages? Why are Italian and British households so much richer, on average, than Swedish and Finnish households? Does this reflect differences in the asset valuation criteria, or a diverse balance between public and private provision of life security? Is wealth inequality really higher in Sweden than in the United States?

There is, however, a second important reason for the LWS endeavor. Comparing micro and macro sources on household wealth across countries is an effective way to learn about relative weaknesses and methodological differences; it is instrumental in defining an internationally agreed frame for the collection and classification of household wealth at the individual level – as done in the past by LIS for income statistics. Cross-national differences will never be eliminated entirely, and perfect comparability is hardly achievable. But the LWS project provides a starting point for a much needed process of *ex ante* standardization of methods and definitions. The release of the  $\alpha$ -version of the LWS database to the scientific community will allow a considerable progress in substantive research on household wealth on a comparative basis, but it must also be seen as a first step toward the construction of better cross-country comparable wealth data.

At this stage, the LWS project is similar to where the LIS project was 20 years ago. Definitions have been suggested, patterns have been identified and explanations are still to emerge. But a sense of excitement is in the air. We know that LIS has paved the way to a whole range of comparative cross-national studies by increasing the ratio of “signal” to “noise” in comparative studies of income distribution, poverty, and inequality more generally (Butz and Torrey, 2006). We can only hope that LWS can achieve similar status in comparisons of wealth and net worth in decades to come.



Table 1

**LWS household wealth surveys**

Country	Name	Agency	Wealth year (1)	Income year	Type of source	Over- sampling of the wealthy	Sample size	No. of non- missing net worth	No. of wealth items
Austria .....	Survey of Household Financial Wealth (SHFW)	Österreichische Nationalbank	2004	2004	Sample survey	No			10
Canada .....	Survey of Financial Security (SFS)	Statistics Canada	1999	1998	Sample survey	Yes	15,933	15,933	17
Cyprus.....	Cyprus Survey of Consumer Finances (SCF)	Central Bank of Cyprus and University of Cyprus	2002	2001	Sample survey	Yes	895	349	24
Finland.....	Household Wealth Survey (HWS)	Statistics Finland	End of 1998	1998	Sample survey	No	3,893	3,893	23
Germany .....	Socio-Economic Panel (SOEP)	Deutsches Institut Für Wirtschaftsforschung (DIW) Berlin	2002	2001	Sample panel survey	Yes	12,692	12,129	9
Italy.....	Survey of Household Income and Wealth (SHIW)	Bank of Italy	End of 2002	2002	Sample survey (panel section)	No	8,011	8,010	34
Norway .....	Income Distribution Survey (IDS)	Statistics Norway	End of 2002	2002	Sample survey plus administrative records	No	22,870	22,870	35
Sweden.....	Wealth Survey (HINK)	Statistics Sweden	End of 2002	2002	Sample survey plus administrative records	No	17,954	17,954	26
United Kingdom .....	British Household Panel Survey (BHPS)	ESRC	2000	2000	Sample panel survey	No	4,867 (2)	4,185	7
United States....	Panel Study of Income Dynamics (PSID)	Survey Research Center of the University of Michigan	2001	2000	Sample panel survey	No	7,406	7,071	14
	Survey of Consumer Finances (SCF)	Federal Reserve Board and U.S. Department of Treasury	2001	2000	Sample survey	Yes	4,442 (3)	4,442 (3)	30

(1) Values refer to the time of the interview unless otherwise indicated. (2) Original survey sample. Sample size can rise to 8,761 when weights are not used. (3) Data are stored as five successive replicates of each record that should not be used separately; thus, actual sample size for users is 22,210. The special sample of the wealthy includes 1,532 households.

Source: LWS database.

Table 2

## Wealth classification matrix in LWS

Asset or liability	LWS acronym	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States	
		SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001	
<b>FINANCIAL ASSETS</b>												
Total.....	TFA	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	
Deposit accounts: transaction, savings and CDs.....	DA	Y	Y	Y	Y (1)	Y	Y	Y	Y (2)	Y	Y	
Total bonds: savings and other bonds.....	TB	Y	Y	Y		Y	Y	Y	Y		Y	
Stocks.....	ST	Y	Y	Y		Y	Y	Y	Y	Y	Y	
Mutual funds and other investment funds ..	TM	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Life insurance .....	LI	–	Y	Y	Y (3)	–	Y	–	Y (2)	Y (4)	Y	
Other financial assets (exc. pension).....	OFA	Y	Y	Y		Y	Y	Y (5)	–		Y	Y
Pension assets .....	PA	Y	Y	Y		–	Y	–	–	Y	Y	
<b>NON-FINANCIAL ASSETS</b>												
Total.....	TNF	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	
Principal residence.....	PR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Investment real estate.....	IR	Y	Y	Y	Y	Y	Y	Y	Y (6)	Y (7)	Y	
Business equity .....	BE	Y	Y	–	Y (6)	Y	Y (6)	Y (6)		Y	Y	
Vehicles .....	VH	Y	Y	Y	Y (8)	Y	Y	–	Y (9)	Y (9)	Y	
Durables and collectibles .....	DRCL	Y	–	Y	Y	Y	Y	–	–	–	Y	
Other non-financial assets.....	ONF		–	–	–	–	–	–	Y (5)	–	–	Y
<b>LIABILITIES</b>												
Total.....	TD	Σ	Σ	Σ	Σ	Σ	Y	Y	Σ	Σ	Σ	
Home secured debt.....	HSD	Σ	Σ	Y	Σ	Y	–	Y (10)	Y	Σ	Σ	
Principal residence mortgage.....	MG	Y	Y		Y		Y (11)	–		Y	Y	Y
Other property mortgage.....	OMG	Y	Y		Y		–	–		Y (7)	Y	
Other home secured debt (incl. line of credit).....	OHSD	Y	–		–		Y	–		–	Y	
Vehicle loans .....	VL	Y	Y	Y	Y	Y (11)	Y (10)	Y (9)	Y (9)	Y		
Installment debt (incl. credit card balance)	IL	Y	Y		Y	Y	Y	Y	Y	Y		
Educational loans.....	EL	Y	Y		Y	–	Y	Y	Y (12)	Y	Y	
Other loans from financial institutions.....	OL	Y	Y	Y	–	Y	Y	Y				
Informal debt .....	ID		Y	–	Y	–	Y	Y				

“Y” denotes a recorded item; “–” denotes a not recorded item; “Σ” indicates that the variable is obtained by aggregation of its components. (1) Excludes checking deposits. (2) DA and LI recorded together. (3) Includes only some pension assets. (4) Includes collectibles and some mutual funds not included in TB. (5) OFA and ONF recorded together. (6) Business assets only. (7) IR recorded net of OMG. (8) As recorded in the 2003 wave. (9) VH recorded net of VL. (10) HSD, VL and IL recorded together. (11) MG, OMG, VL and IL recorded together. (12) Includes also VL, which implies a double-counting.

Source: LWS database, β-version (July 15, 2006).

Table 3

**Reconciling the LWS and national net worth concept**  
(averages in thousands of national currencies)

Wealth variable	Canada	Finland	Italy	Sweden	United States
	SFS 1999	HWS 1998	SHIW 2002	HINK 2002	SCF 2001
LWS net worth.....	102.5	69.3	154.2	537.8	213.1
+ pension assets .....	83.0	0.6	–	–	74.4
+ other financial assets.....	2.5	1.6	0.3	24.5	13.1
+ business equity.....	26.9	–	23.5	80.0 (1)	74.7
+ other non-financial assets ...	28.5	6.5	24.4	17.8	20.6
LWS adjusted net worth .....	243.4	78.0 (2)	202.4	660.1	395.9
<i>LWS coverage ratio (3).....</i>	<i>42.1</i>	<i>88.8</i>	<i>76.2</i>	<i>81.5</i>	<i>53.8</i>
National source net worth.....	249.3	79.8	204.4	660.0	395.5

(1) Business assets only. (2) It does not include other debts. (3) Percentage ratio of LWS net worth to LWS adjusted net worth.

Source: LWS database,  $\beta$ -version (July 15, 2006) and country sources: Statistics Canada (2006a); Finnish data provided by Markus Säylä; Brandolini *et al.* (2006); Statistics Sweden (2004); Aizcorbe, Kennickell and Moore (2003). Household weights are used.

Table 4

**Share of missing values in major components of LWS net worth**  
(percentages)

Wealth variable	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Non-financial assets...	–	25	–	3	0.0001	–	–	2	2	–
Financial assets .....	–	21	–	4	–	–	–	9	-	–
Debt .....	–	43	–	3	–	–	–	7	3	–
Net worth .....	–	61	–	4	0.0001	–	–	14	5	–
Sample size .....	15,933	895	3,893	12,692	8,011	22,870	17,954	4,867	7,406	4,442

Source: LWS database,  $\beta$ -version (July 15, 2006).

Table 5

**Per capita household wealth in LWS database and national balance sheets**  
(euros and per cent)

Wealth variable	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
<i>LWS database</i>										
Non-financial assets..	28,237	32,763	31,920	53,507	50,965	14,605	33,132	61,436	63,170	77,686
Financial assets.....	8,018	6,294	6,181	7,971	8,913	22,066	12,943	11,036	31,332	47,059
Debt .....	9,577	3,719	6,032	11,202	2,590	29,561	16,159	13,572	20,857	26,707
Net worth.....	26,678	35,339	32,069	50,276	57,288	7,110	29,916	58,901	73,646	98,037
<i>National balance sheet</i>										
Non-financial assets..	32,492	–	–	69,234	78,417	–	–	67,728	66,679	
Financial assets.....	51,157	38,099	20,317	44,731	48,780	42,268	40,927	87,199	123,768	
Debt .....	13,813	15,825	7,147	18,750	7,089	33,629	16,577	20,471	31,003	
Net worth.....	69,836	–	–	95,215	120,108	–	–	134,457	159,444	
<i>Ratio of LWS to NBS</i>										
Non-financial assets..	87	–	–	77	65	–	–	91	95	117
Financial assets.....	16	17	30	18	18	52	32	13	25	38
Debt .....	69	23	84	60	37	88	97	66	67	86
Net worth.....	38	–	–	53	48	–	–	44	46	61

Source: LWS database,  $\beta$ -version (July 15, 2006) and country sources: Eurostat (2006) for financial assets and debt of European countries; personal communication by Ulf von Kalckreuth, Brandolini *et al.* (2006) and Office for National Statistics (2006) for non-financial wealth in Germany, Italy and the United Kingdom, respectively; Statistics Canada (2006b); Board of Governors of the Federal Reserve System (2006). LWS figures are given by the ratios between wealth totals and number of persons in each survey; household weights are used. National balance sheets (NBS) figures are obtained by dividing total values for the sector "Households and non-profit institutions serving households" by total population. All values are expressed in euros at current prices by using the average market exchange rate in the relevant year.

Table 6

**Demographic structure**

Household characteristic	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Mean household size.....	2.43	3.35	2.16	2.14	2.65	2.14	1.96	2.35	2.38	2.43
Mean age of the household's head.....	47	49	49	52	55	49	51	53	48	49
Age composition of household's head (%)										
24 or less.....	5.9	1.0	7.3	3.7	0.7	7.2	6.6	3.8	5.3	5.6
25-34.....	19.6	21.3	16.7	15.2	9.4	19.3	16.9	14.3	18.6	17.1
35-44.....	24.7	24.7	20.0	20.6	21.5	19.4	17.7	19.3	22.2	22.3
45-54.....	19.6	16.9	21.0	17.5	18.8	18.0	17.5	17.4	22.4	20.6
55-64.....	11.9	15.4	13.8	16.5	16.9	14.1	16.6	14.9	12.5	13.3
65-74.....	10.4	15.0	11.7	14.9	18.2	9.8	10.9	14.0	10.9	10.7
75 and over.....	7.9	5.7	9.5	11.6	14.5	12.2	13.8	16.3	8.1	10.4
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used.

Table 7

**Household asset participation**  
(percentages)

Wealth variable	Canada	Cyprus	Finland	Germany (1)	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
<i>All assets as recorded</i>										
Non-financial assets .....	64	76	68	43	72	72	57	70	65	70
Principal residence .....	60	74	64	39	69	64	53	69	64	68
Investment real estate .....	16	17	27	13	22	30	14	8	–	17
Financial assets .....	90	86	92	50	81	99	79	80	83	91
Deposit accounts .....	88	78	91	–	81	99	59	76	82	91
Bonds .....	14	44	3	–	14	–	16	–	–	19
Stocks .....	11	40	33	–	10	22	36	–	30	21
Mutual funds .....	14	1	3	–	13	38	58	–	–	18
Debt .....	68	65	52	30	22	80	70	59	68	75
Home secured debt .....	41	–	28	–	10	–	–	39	–	46
<i>Only financial assets and non-housing debt exceeding 2,500 euros</i>										
Non-financial assets .....	64	–	68	43	72	72	–	70	65	70
Financial assets .....	48	–	53	49	70	70	–	58	56	60
Total debt .....	58	–	45	30	17	74	–	49	59	65

Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. (1) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros.

Table 8

**Household portfolio composition**  
(percentage share of total assets)

Wealth variable	Canada	Cyprus (1)	Finland	Germany (2)	Italy	Norway (3)	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Non-financial assets.....	78	–	84	87	85	–	72	83	67	62
Principal residence.....	64	–	64	64	68	–	61	74	52	45
Real estates .....	13	–	20	23	17	–	11	9	14	17
Financial assets .....	22	–	16	13	15	–	28	17	33	38
Deposit accounts.....	9	–	10	–	8	–	11	9	10	10
Bonds .....	1	–	0	–	3	–	2	–	–	4
Stocks.....	7	–	6	–	1	–	6	–	23	15
Mutual funds.....	5	–	1	–	3	–	9	–	–	9
Total assets.....	100	–	100	100	100	–	100	100	100	100
Debt .....	26	–	16	18	4	–	35	21	22	21
<i>of which: home secured...</i>	22	–	11	–	2	–	–	18	–	18
Net worth .....	74	–	84	82	96	–	65	79	78	79

Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. Shares are computed as ratios of means. Figures may not add up because of rounding. (1) Figures not reported, because over 60 per cent of values for net worth are missing. (2) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros. (3) Figures not reported because valuing real estate on a taxable basis and debt at market prices causes a major inconsistency (indeed, the majority of households have non positive net worth).



Table 9

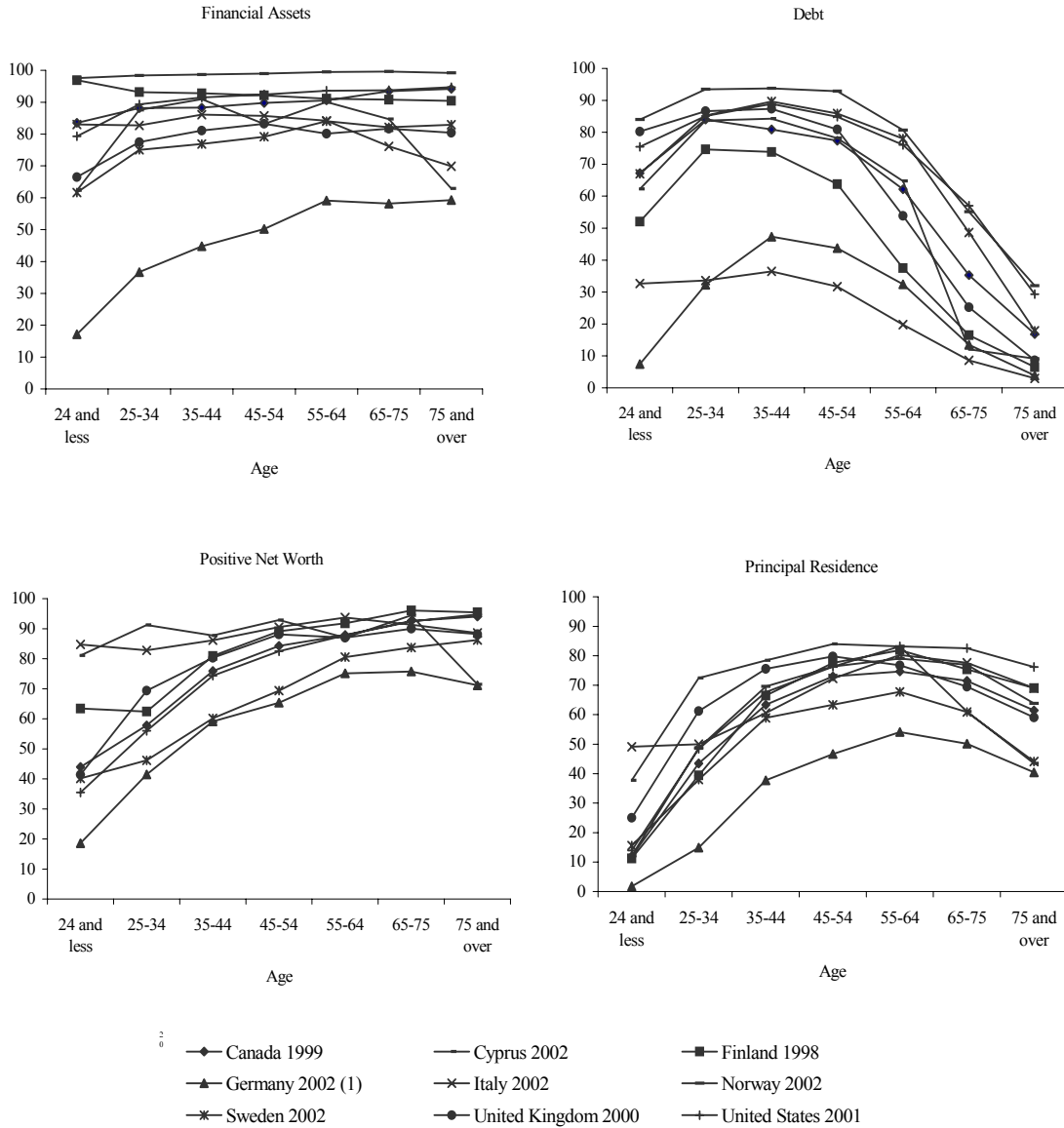
**Distribution of household net worth**  
(percentages)

Statistics	Canada	Cyprus (1)	Finland	Germany (2)	Italy	Norway (3)	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Positive net worth .....	77	–	83	63	89	–	68	82	77	77
Nil net worth .....	3	–	2	29	7	–	5	6	8	4
Negative net worth .....	20	–	15	9	3	–	27	11	16	19
Quantile/median ratios										
10 <sup>th</sup> percentile .....	-17	–	-6	0	0	–	-84	0	-11	-15
25 <sup>th</sup> percentile .....	0	–	1	0	8	–	-1	2	0	0
75 <sup>th</sup> percentile .....	350	–	218	886	209	–	447	238	378	368
90 <sup>th</sup> percentile .....	708	–	390	1,818	359	–	972	482	925	980
Wealth shares										
Top 10% .....	53	–	45	54	42	–	58	45	64	71
Top 5% .....	37	–	31	36	29	–	41	30	49	58
Top 1% .....	15	–	13	14	11	–	18	10	25	33
Gini index .....	75	–	68	78	61	–	89	66	81	84

Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. (1) Figures not reported because over 60 per cent of values for net worth are missing. (2) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros. (3) Figures not reported because valuing real estate on a taxable basis and debt at market prices causes a major inconsistency (indeed, the majority of households have non positive net worth).

Figure 1

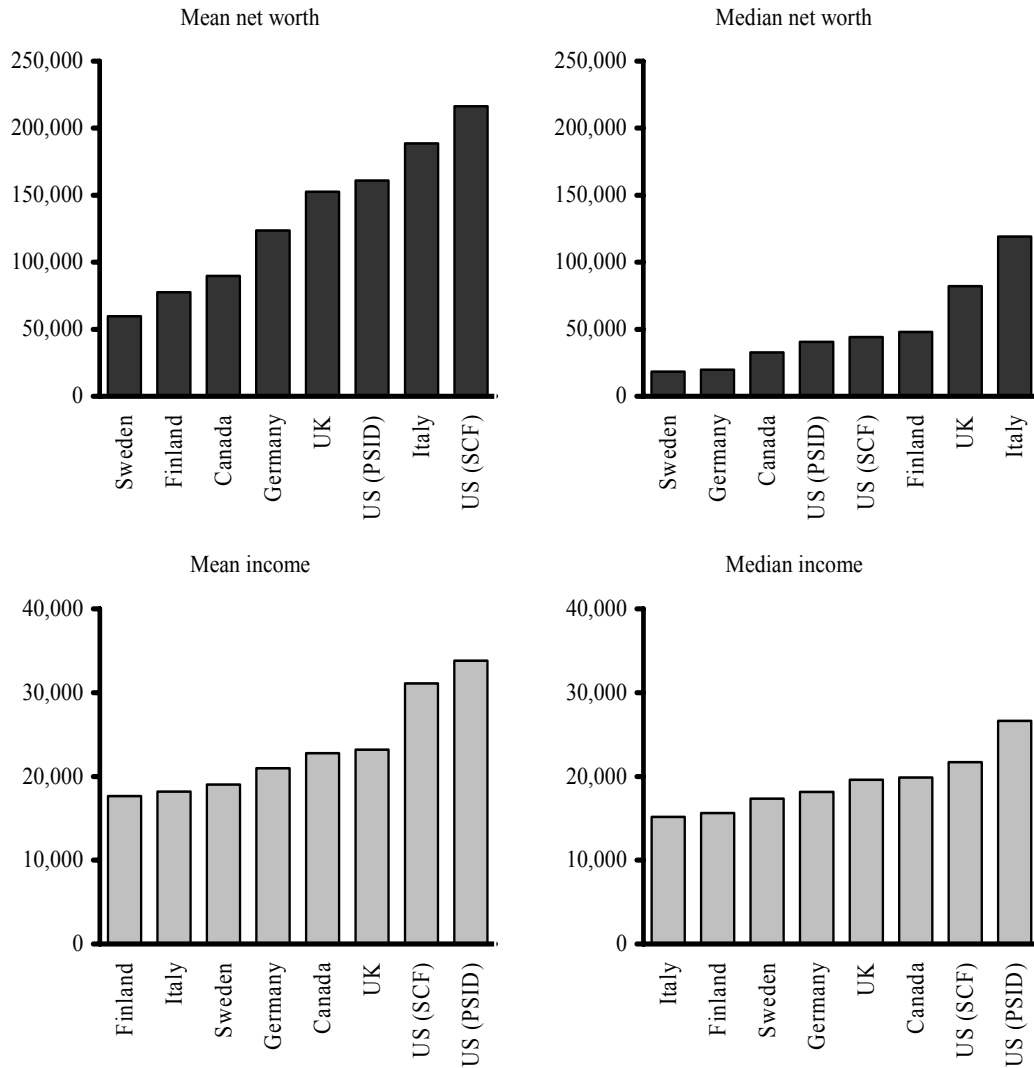
**Fraction of holders, by age of the household's heads  
(percentages)**



Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. (1) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros.

Figure 2

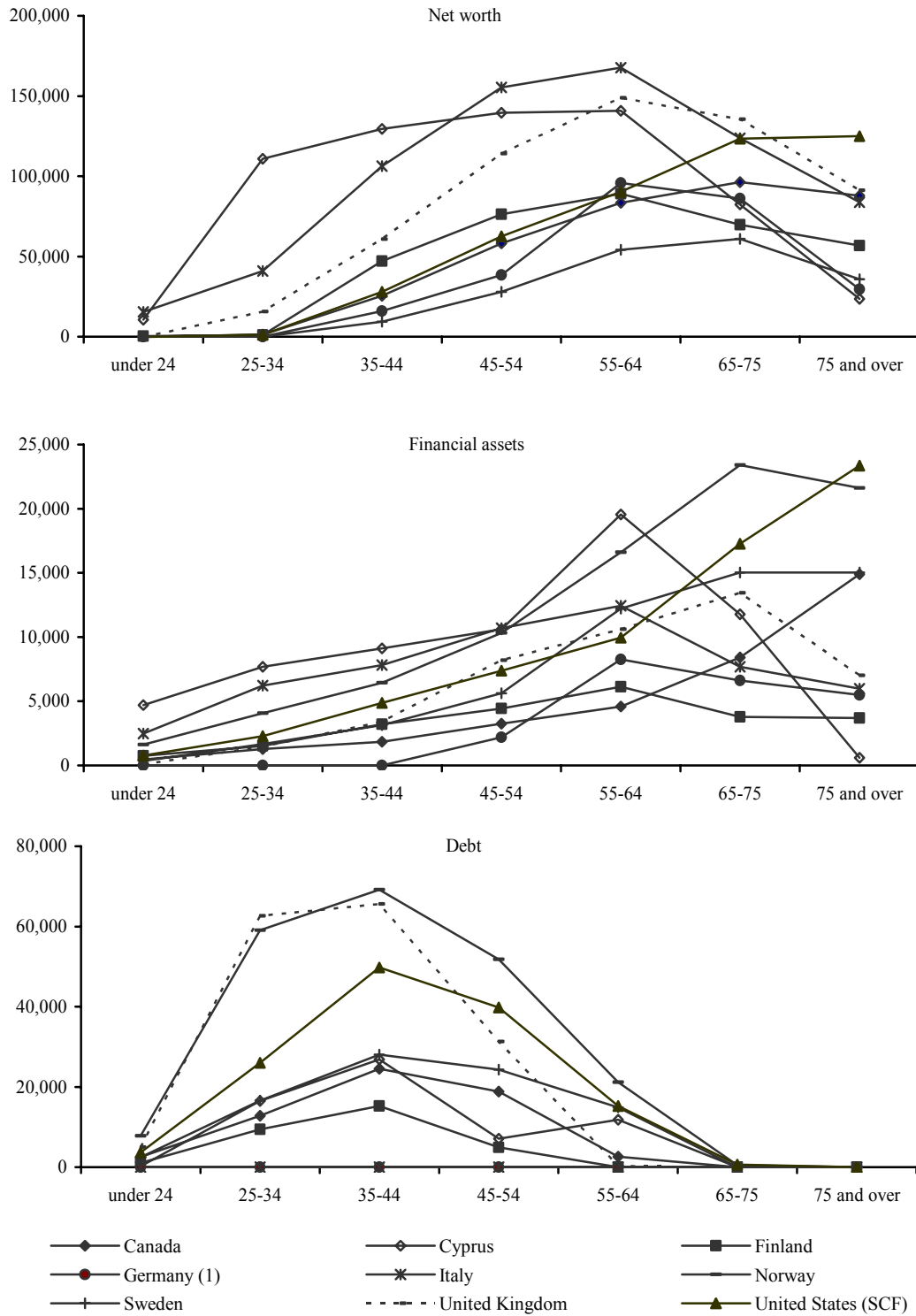
**LWS country rankings by mean and median of net worth and income**  
(2002 U.S. dollars)



Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used.

Figure 3

**Median wealth holdings by age of the household's head**  
(2002 U.S. dollars)



Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used.

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## DISCUSSION OF THE PAPER BY E. SIERMINSKA, A. BRANDOLINI AND T.M. SMEEDING

Marco Di Marco\*

### 1. How much caution?

The paper by Sierminska, Brandolini and Smeeding “Comparing Wealth Distribution Across Rich Countries”, proposes a sound secondary analysis of the existing microdata on households’ wealth, by skilled economists with proven experience in the empirical and theoretical study of the distribution of incomes (and on related issues). Indeed, it would be difficult to raise a single objection, or make even a small improvement to their work. Nonetheless, after having read (and admired) the paper, I did wonder what is the true extent of the warning: ‘*Researchers must be aware that many problems remain and that comparative results must be taken with some caution*’. It is clear from the rest of the paper that the abovementioned statement calls for much more attention than the usual prudent disclaimer, suggested by the *etiquette* of academic writings.

Given the current state of the art, it is very difficult to assess how cautiously the results should be considered. Indeed, this is the main weakness of any secondary analysis of the existing microdata on wealth, as it is not easy to know whether and to what extent they are comparable. This is also the reason why, though their study contains many interesting findings and raises many important ideas for future analyses, I believe the most important conclusion of Sierminska, Brandolini and Smeeding is the awareness that ‘*Comparing micro and macro sources on household wealth across countries is [...] instrumental in defining an internationally agreed frame for the collection and classification of household wealth at the individual level. [...] the LWS project provides a starting point for a much needed process of ex ante standardization of methods and definitions*’.

Drawing on the experience with the EU SILC project (European Union Statistics on Income and Living Conditions), in my commentary I primarily wish to highlight that whilst it is usually very difficult to assess the degree of data comparability *ex post*, provided that the different participating countries share a common understanding of what comparability is, a lot can be done *ex ante*. In the planning of the EU SILC project the team of researchers soon realized that as regards data comparability, semantic problems can be as important as (and in fact overlap with) the statistical and economic issues. When it comes to designing a harmonised data collection strategy, semantics come into play, at various levels. For example, in the interpretation of: (i) the wording used for the definitions of the variables; (ii) the technical explanations for the interviewers (and users when releasing the data); (iii) the wording of the questions of the national surveys (the sequence itself can also influence the interpretation) etc.<sup>1</sup> Most importantly, in my opinion semantics affect the concept of comparability itself, for at least two reasons: (i) comparability still deserves an agreed definition;<sup>2</sup> (ii) it seems to me that a definition of

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<sup>1</sup> It should be kept in mind during the planning of the data production process that the harmonization of definitions and other technical material requires more than a mere ‘word-for-word’ translation, since agreement over what constitutes a ‘literal translation’ can differ according to the country specific socio-economic context. For example, in European countries the (literal translations of the) words ‘family allowances’ can be referred to different social benefits.

<sup>2</sup> The issue is explored in Eurostat ‘*Comparative EU Statistics on Income and Living Conditions: Issues and Challenges*’, Luxembourg 2007 (see the contributions by Aaberge *et al.*, Verma, Di Marco).

comparability should necessarily account for the meaning of the measures to be compared. Let me now explain my ideas about what could be a simple definition of comparability.

## 2. Comparability: what does it mean?

First of all, economic analyses require comparability at the micro level, i.e. of statistical units within and across countries (micro-comparability).<sup>3</sup> The second important aspect of comparability is its relativity: we should seek primarily ordinal measures of comparability, based on assessments like: ‘the dataset (the statistic, the interpretation) A is more suitable for international comparisons than B’. After all, such ordinal assessments are the only way to evaluate the success of endeavours to produce datasets (indicators, analyses) harmonized at the international level, since comparability is the ultimate aim of harmonization.

In my mind, comparability is simply ‘meaningful accuracy’ at the micro level. Thus, a concise definition may be expressed as follows:

Comparability is a property (a set of properties) of the data production processes (inputs, techniques and outputs) that permits meaningful comparisons, within and across countries (regions, sub-groups) and between any couple of statistical units.

The proposed definition ‘locates’ comparability in the data production processes.<sup>4</sup> Nevertheless, it is circular, as it describes comparability in terms of (meaningful) *comparisons*. Thus, the term ‘comparison’ must be explained. In mathematics, the comparability of a set of objects is the property that a given relation is defined (i.e. exists) between any pair of them. Put simply, the elements of a set are comparable when, for any couple of elements  $x$  and  $y$  of the set, there exists a relation  $R$  so that at least one of the two following statements is true:

$$x R y \quad ; \quad y R x$$

Each one of the preceding statements (as well as their logical union) is a comparison. For the income and wealth variables, an obvious choice for the relation  $R$  is the ‘greater than or equal to’ assessment, since it permits the statistical units to be ranked the poorest to the richest. Thus, in the case of income and wealth, it turns out that measurement *accuracy lies at the conceptual core of data comparability*. Furthermore, coupled with proper qualifications about the interpretation of the results (‘which comparisons are meaningful?’), accuracy is all we need for economic comparability too. In its obviousness, it is an encouraging conclusion given that in many scholarly discussions international comparability so often appears to be an elusive multidimensional concept.

<sup>3</sup> In the case of income, micro-comparability is required because most measures of inequality and poverty are based on the ranking of the statistical units. For example, micro-comparability ‘within’ each country (i.e. between each couple of statistical units, in a given country) is a pre-requisite for the across-country comparison of statistical measures of inequality. Micro-comparability ‘across’ countries (i.e. between each couple of statistical units, wherever they live) is required when many countries are compared with reference to a common benchmark (e.g., a European Poverty Line). I believe that many of these arguments apply to the distribution of wealth as well, with proper qualifications.

<sup>4</sup> For more details on this point, see Vijay Verma’s keynote address to the ‘International Conference on Improving Surveys’, Copenhagen, 2002 (‘*Comparability in International Survey Statistics*’).



The pursuit of meaningful comparisons corresponds to the requirement of semantic consistency and builds a bridge from data comparability to economic comparability: the comparisons may be interpreted correctly (i.e. are meaningful) if, being measured against accuracy, are also suitable for economic analysis. To this end, the comprehensiveness of the income/wealth definition (a semantic issue) is of paramount importance and should be included in the common *ex ante* understanding of what comparability is:

For any couple of statistical units, the relation “ $\geq$ ” between their incomes can be correctly established if the definition of income/wealth is *comprehensive*, i.e. if it includes all the components relevant for economic comparability.

For the sake of comprehensiveness, the possible trade-offs between mere measurement accuracy and economic comparability should not be decided at the expense of economic comparability, for example by dropping the ‘difficult-to-measure’ components. In my opinion, this would lead to meaningless accuracy. In the light of the definition of comparability as ‘meaningful accuracy’, an even stronger argument can be made: in principle, no trade-offs may occur between meaningful accuracy and comparability, since they are essentially different ways to express the same concept.

I am, of course, aware that in practice perfect comparability cannot always be achieved and that meaningful accuracy remains an ideal, unattainable, standard (for example, because the measurement of some income and/or wealth components entails a certain degree of underreporting). In these cases, researchers and data producers are condemned to strike a difficult compromise between measurement accuracy and comprehensiveness. One of the most interesting statements from the paper of Sierminska, Brandolini and Smeeding says: ‘*until a greater standardisation of wealth surveys is achieved ex ante, we have to trade off higher comparability against a somewhat incomplete picture of national wealth*’. Really, in secondary analyses nothing more can be done than to alert the reader about the undesirable (and semantically inconsistent) trade-off.<sup>5</sup>

Most importantly, the customary attitude to trading off measurement accuracy against comprehensiveness of the income/wealth definition should be put aside when implementing the much needed *ex ante* harmonisation of income/wealth surveys. To maximize comparability, measurement accuracy and comprehensiveness should be simultaneously pursued. Having being involved in the setting up of the EU SILC project, my best advice to the researchers who will be in charge of preparing a new international survey on wealth are: (i) to discuss and agree from the very start the concept of comparability and; (ii) to set meaningful accuracy as the ideal benchmark from the outset.

My proposal for a non-circular definition of comparability may be summed up in the following proposition:

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<sup>5</sup> In truth, my only critique of the authors’ arguments is that in my mind the trade-off is between measurement accuracy and comprehensiveness, not between comparability and comprehensiveness. I believe it is important to highlight that comprehensiveness is a necessary condition for comparability.

Regarding the collection of income/wealth data from households and/or individuals, international comparability requires the *comparability of statistical units* within and across countries (micro-comparability). Micro-comparability, on its turn, essentially coincides with *meaningful* accuracy. That is to say, with measurement accuracy together with semantic consistency of the income/wealth definitions. A necessary condition for semantic consistency is the *comprehensiveness* of the income/wealth definition.

# THE STOCK MARKET, HOUSING AND CONSUMER SPENDING: A SURVEY OF THE EVIDENCE ON WEALTH EFFECTS

Monica Paiella\*

## 1. Introduction

The second half of the 1990s recorded a dramatic increase in stock values. In the US, the annual return to equity rose from an average 5.9 percent in the first half of the 1990s to an astonishing 26.3 percent average annual return from 1996 to 1999. Over the same period the aggregate saving rate dropped from 4 to 2 percent in the US. Similar evidence was recorded in many other industrialized countries. In the Euro area, the aggregate saving rate fell from 17 to 14 percent (OECD, 2004). This led to renewed policy and scientific interest in the effects of household wealth upon consumer spending. To the extent that the inflation of stock prices increased spending pressures, there were good reasons to fear that constant or declining share prices could depress consumption and exacerbate a slowdown in the economy.

However, the stock market decline of the late 1990s did not depress expenditure as expected. The leading explanation for the limited impact of falling stock prices on aggregate demand is that of an offsetting real estate wealth effect (Benjamin, Chinloy and Jud, 2004). In fact, the decline occurred at a time of sharply rising housing prices: during 2000-2001, house prices grew by over 8 percent a year in the US<sup>1</sup> and similar rates were recorded in the UK and Euro area. In many countries the cycles of house price and consumption growth were closely synchronized. Catte *et al.* (2004) found that, on average, for OECD countries the correlation between house prices and consumption growth had been 0.6 over the past 30 years.

An alternative explanation relies on the observation that a small fraction of the variation in household wealth is related to changes in spending. The empirical evidence for most countries suggests that household consumption is correlated with wealth and does respond to permanent changes in wealth. However, the vast majority of the fluctuations in asset values are attributable to transitory innovations that display no association with consumer spending (see Lettau and Ludvigson, 2004).

As to the nature of the correlation between asset prices and consumption, it is tempting to attribute it to a direct wealth effect: rising asset prices increase household wealth, which in turn increases consumption, via the budget constraint. There are however several reasons not to make this attribution without further analysis, as there are alternative explanations for the correlation between asset prices and consumer spending.

One such explanation is that they are driven by a common macroeconomic factor. For example, asset prices may respond to future income prospects to which current consumption also responds, provided that households do not suffer borrowing constraints. Alternatively, financial market liberalization may drive up asset prices and stimulate consumption by relaxing borrowing constraints, as suggested by Muellbauer and Murphy

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\* University of Naples "Parthenope". The paper was prepared while the author was employed at the Bank of Italy. I thank Franco Peracchi and Ignazio Visco for very valuable discussion and suggestions and the participants at the conference on Italian household wealth, organized by the Bank of Italy on October 16-17, 2007, for their comments.

<sup>1</sup> The source for the US is the Office of Federal Housing Enterprise Oversight (historical data available at: [www.ofheo.gov/house/](http://www.ofheo.gov/house/)).

(1990). As to house prices, King (1990) and Pagano (1990) argued that an upward revision of expected future incomes may simultaneously increase the demand for housing services – which in turn raises house prices, given that housing is in relatively fixed supply – and consumption.

Another hypothesis is that asset and, in particular, house prices may affect consumption by relaxing (or tightening) borrowing constraints. Housing is an asset that can be used as collateral in a loan. For borrowing constrained homeowners, an increase in house prices relaxes credit constraints and may lead to an increase in spending because it allows homeowners to borrow more and to smooth consumption over the life cycle. A related issue is that changes in asset prices may affect households' desire for other forms of precautionary savings, too. When the price of an asset rises, the stock of savings held in that form increases, and households may choose to reduce the stock of other assets and increase consumption.

It is crucial to distinguish among these alternative explanations for the asset price-consumption correlation for several reasons, beyond the basic goal of understanding household behavior better. First of all, if wealth is not causal to consumption, a decline in asset prices would be interpreted as a symptom of a future slowdown in consumer spending, rather than a cause. Further, the implications of a sharp correction in asset prices might differ depending on whether a price change causes revisions in the expectations of future economic conditions. Finally, if the wealth effects on consumer spending are mainly direct, and there is a causal channel, the heterogeneity of household portfolios necessarily implies considerable heterogeneity in the response of household consumption to asset prices.

This paper reviews the evidence on these issues. It updates the work of Poterba (2000) by reviewing the most recent studies on wealth effects. These studies explicitly set out to improve our understanding of the links between asset prices and consumer spending and go beyond the quantification of the wealth effects, which was the focus of most of the studies of 1990s. Furthermore, it extends Poterba (2000) which concentrates primarily on stock market wealth effects, by examining the impact of house price changes on consumer spending. The effects of housing wealth on consumption only recently began to receive significant attention, when house prices started climbing in the late 1990s and early 2000s. The debate then intensified as the housing market exhibited signs of cooling down towards the middle of this decade. Finally, the paper compares the evidence available across countries and discusses the extent to which institutional differences are behind the heterogeneity in the response of household consumption to asset prices.

The rest of the paper is organized as follows. Section 2 briefly reviews the life-cycle model for consumption, which provides a rigorous theoretical framework to appraise the relevance of wealth effects. Section 3 examines the time-series and household data-based econometrics of wealth effects. Section 4 discusses the empirical evidence based on macro data, while section 5 reviews the micro-data-based evidence. Lastly, section 6 presents the conclusions.

## **2. Conceptual framework: the life-cycle model for consumption**

The basic ideas and key theoretical links between wealth and consumption can be described using the life-cycle model of household spending behavior, developed by Modigliani and Ando (1960) and Ando and Modigliani (1963). According to the life-cycle model, households accumulate and deplete their wealth to keep their consumption more or less steady. In the absence of unpredictable changes in wealth, the model predicts

that wealth could vary even substantially over the household's lifetime, but their consumption will remain relatively stable. However, if households experience an unexpected change in their wealth, they will revise their consumption plan. Thus, the model suggests that predictable changes in asset prices should not lead to changes in planned consumption, while unexpected changes should generate a response.

Economists have extended the basic model in several directions to obtain a more realistic description of the process by which households make their consumption-saving decisions. In particular, they have allowed for the possibility that households are unable to borrow as much as they would like against higher future incomes. They also have allowed for the possibility that households may want to keep some assets as a precaution against unpredictable, future, adverse events or to bequeath to younger generations. These extensions do not change the basic predictions of the model: as long as households can borrow against anticipated future increases in income or wealth, they will try to keep their consumption constant. Nevertheless, the extensions help to explain some deviations from the basic predictions. They allow for the possibility that consumption may respond to predictable changes in income or wealth or respond slowly to permanent changes. They also suggest that household spending may be related to all those variables that help to predict future changes in income or wealth.

Economists have started from the basic predictions of the life-cycle theory to build empirical models and quantify the relationship between consumption and wealth. These models have been used to estimate the consumption response to changes in wealth. The theory in its simplest form predicts that the marginal propensity to consume (*mpc*) out of all wealth, whatever its form, should be the same small number. In practice though, if assets are not fungible and households develop "mental accounts" that dictate that certain assets are more appropriate to use for current expenditure and others for long-term saving, or if they view the accumulation of some kinds of wealth as an end in itself or rather bequeath their wealth in a specific form for tax or other reasons, the extent and nature of wealth effects may turn out to be asset-type specific. Furthermore, the overall effect on aggregate consumption of a change in the price of some asset crucially depends on the weight of that asset in the aggregate portfolio.

Two types of approach have been used for the empirical appraisal of wealth effects: one relies on aggregate data; the other is based on household-level data. In the next section, we will review the econometrics of these approaches before turning to the empirical evidence.

### **3. The econometrics of wealth effects**

#### *3.1 Time series econometrics of wealth effects<sup>2</sup>*

Most recent macroeconomic studies of wealth effects use a logarithmic<sup>3</sup> approximation to the aggregate consumption function that can be derived solely from the intertemporal budget constraint and takes the form of:

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<sup>2</sup> See Davis and Palumbo (2001) and Lettau, Ludvigson and Steindel (2002) for a detailed review of the statistical approach typically employed by macroeconomists to investigate the empirical link between data on household consumption, income and wealth.

<sup>3</sup> Aggregate time-series data on consumption, income and wealth appear to be closer to linear in logs than linear in levels.

$$c_t = a_0 + a_1 y_t^d + a_2 w_t + u_t, \quad (1)$$

where  $c_t$  is log per-capita planned expenditure;  $y_t^d$  is log per-capita disposable income;  $w_t$  denotes log per-capita wealth; and,  $u_t$  is the error term capturing the effects of unexpected shocks to consumption.<sup>4</sup>

Equation (1) is a description of the long-run relationship between consumption, income and wealth. The coefficients  $a_1$  and  $a_2$  give the effect on consumption of permanent changes, i.e. changes that are sustainable in the long run, in wealth and income and have the magnitude of an elasticity. The implied level responses, i.e. the marginal propensities to consume, can be backed out using recent values of the consumption-income and consumption-wealth ratios.

In the data, consumption, income and wealth exhibit very strong upward trends over time. However, if the variables are *co-integrated*, the error of (1) is stationary and the parameters of interest can be estimated by ordinary least square estimates, which are super-consistent and, therefore, robust to the presence of regressor endogeneity.

Deviations from the long-run relationship are possible in the short run. To address the issues of short-run dynamics, of which variables adjust to restore the long-run equilibrium, and of the time taken by the adjustment process, researchers typically estimate a vector error-correction model of the consumption-income-wealth relationship, such as:

$$\Delta x_t = b_0 + b_1 u_{t-1} + B(L) \Delta x_{t-1} + v_t. \quad (2)$$

$\Delta x_t$  is the vector of log differences ( $\Delta c_t \Delta y_t^d \Delta w_t$ );  $b_0 \equiv (b_{0c} \ b_{0y} \ b_{0w})$  and  $b_1 \equiv (b_{1c} \ b_{1y} \ b_{1w})$  are  $3 \times 1$  vectors of coefficients;  $B(L)$  is a finite-order distributed-lag operator; and  $u_{t-1}$  denotes the last period's equilibrium error, corresponding to the difference between actual and planned consumption, and is based on (1).  $b_1$  is the vector of adjustment coefficients and tells us which variables contribute to restore the long-run equilibrium when a deviation occurs.<sup>5</sup> A negative statistically significant  $b_{1c}$  would imply that current period consumption moves to correct an *error* from the last period. However, it is also possible that, when consumption deviates from its usual ratio to income and wealth, it is wealth, or labor income, and not necessarily consumer spending, that adjusts until the equilibrium relationship is restored.

It is worth stressing that the presence of a wealth effect on consumption is not inextricably linked to error-correction behavior in consumption. The latter phenomenon tells us about the time needed for consumption to adjust to permanent changes in wealth, but nothing about the magnitude of the wealth effect. A statistically significant long-run wealth effect and no error-correction in consumption would imply that spending adjusts to permanent changes in wealth within the period.

In practice, many time-series studies of wealth effects do not estimate the full vector error-correction model in (2), and focus instead on a single equation error-correction for consumption. Furthermore, in many instances, these studies augment the

<sup>4</sup> Since Campbell (1987) it has been clear that equation (1) can be derived solely from the intertemporal budget constraint, with no need of assumptions concerning preferences and the stochastic processes generating the variables. This makes it less vulnerable to the Lucas critique, which has greatly undermined the popularity of the models based on aggregate consumption functions in the 1980s. In fact, a solved-out relationship of consumption, income and wealth would require a stable data-generating process for expectations.

<sup>5</sup> The Granger Representation Theorem states that, if the vector  $x_t$  is co-integrated, at least one of the adjustment parameters –  $b_{1c}$ ,  $b_{1y}$ ,  $b_{1w}$  – is statistically significant in the error-correction representation.

single equation regression for consumption growth adding conditioning variables to the set of explanatory variables that are part of the error-correction representation.

The single equation approach yields consistent estimates of the adjustment parameter<sup>6</sup> and allows us to appraise the short-run dynamics of consumption and to verify to what extent consumption adjusts to restore the long-run equilibrium in case of an equilibrium distorting shock. However, unless consumption does all the adjusting ( $b_{1c} \neq 0$ ) and income and wealth none of it ( $b_{1y} = 0$ ,  $b_{1w} = 0$ ), in order to infer the speed of the adjustment in consumer spending subsequent to a shock, it is necessary to take into account the adjustments of all the variables in the system. System estimation is therefore needed.

As to the addition of conditioning variables, the error-correction equation for consumption becomes:

$$\Delta c_t = \tilde{b}_{0c} + \tilde{b}_{1c} u_{t-1} + \tilde{B}(L) \Delta x_{t-1} + C(L) z_t + v_t, \quad (3)$$

where  $z_t$  denotes a set of predetermined variables that economists have found to influence the short-run dynamics of consumption. They generally include real interest rates, unemployment rates, measures of consumer sentiment, and so on. These variables are typically motivated by the extensions to the simple life-cycle model mentioned earlier. More importantly, in finite samples, efficiency gains can be obtained by including additional variables if they are important short-run determinants of consumption growth. However, if the additional explanatory variables are not weakly exogenous, the adjustment parameter  $b_{1c}$  cannot be recovered from the estimation of a single equation specification such as (3) (Engle and Granger, 1987).<sup>7</sup> A solution would be using a two-step procedure. In the first step, each element of  $z_t$  should be regressed on the right-hand-side variables in (2). In the second step, the estimation of (3) would be carried out after replacing  $z_t$  with the estimated residual from first-step estimation. The efficiency gains would be preserved and the estimation would allow us to uncover the adjustment parameter of interest.

The single equation macro-econometric approach has recently been extended to panel data covering a set of countries by applying the method for co-integrated panels of Pesaran, Shin and Smith (1999) to the analysis of the relationship between consumption, income and wealth. This estimator pools the long-run relationship of individual countries while short-run responses are flexible and unrestricted across countries. The hypothesis of equal long-run coefficients across countries can be tested. If this hypothesis is rejected by the data, pooling, and therefore imposing homogeneity, can still be desirable when samples are small if one is interested in average effects. In fact, the averages of unrestricted individual group coefficients are sensitive to outliers in small samples. Pooling reduces such bias and the estimated coefficient can be interpreted as the weighted averages of individual group estimators where the weights are determined by the inverses of their variance-covariance matrixes.

<sup>6</sup> The parameters of the vector error-correction model can be estimated consistently equation by equation by ordinary least squares estimation of (2) (Engle and Granger, 1987, and Stock, 1987).

<sup>7</sup> The intuition behind this result is that  $b_{1c}$  captures the co-variation between this period consumption growth and the last period co-integrating error. In estimating the adjustment parameter, one does not want to remove the variation in the co-integrating error that is correlated with  $z_t$ . In fact, if  $u_{t-1}$  and  $z_t$  are correlated, the estimate of the coefficient of  $u_{t-1}$  will tell us how consumption adjusts to a disequilibrium that is not associated to a variation in  $z_t$ , but nothing about the adjustment to a disequilibrium associated to a variation in  $z_t$ .

The estimation of the long-run statistical relationship between consumption, income and wealth requires long time-series of data.<sup>8</sup> This partly explains the sensitivity of long-run parameters to the sample period chosen for the estimation and the disparity of the estimates of wealth effects in the literature.<sup>9</sup> Further, since long time-series of data are not available for many countries, especially for wealth, most estimates of the strength of the wealth effects refer to the United States. A number of different approaches have been used to generate estimates of consumption responses to changes in wealth for other industrialized countries. These approaches include calibration estimates based on the existing evidence for the United States and estimates using asset prices as a proxy for wealth.

### 3.2 Micro-econometric analysis of wealth effects

The time-series approach to wealth effects allows us to distinguish between the short-run and the long-run relationship between consumption, income and wealth. It allows us to identify which variables adjust to restore the long-run equilibrium in the case of a shock, and to determine the time taken by the adjustment process. However, it is not informative about the nature of the relationship between consumption and wealth and does not allow us to distinguish between the alternative hypotheses – of direct causality, of common factors or of impact through borrowing constraints. Individual level data enable us to examine the effects of prices on individual household's consumption, helping to unpick these theories which are observationally equivalent in aggregate data, but have different implications for the behavior of different types of households. Furthermore, reliance on aggregate data to detect an effect of asset price changes on consumption fails to assess heterogeneous responses by different groups of households to the same price movement and may lead to the wrong conclusion that consumption does not respond to capital gains, or if it does, only weakly. In fact, if aggregate consumption were found not to respond to asset price changes, it would not be possible to say whether this is due to consumers not changing their spending when faced with changes in the value of their assets or else to heterogeneous responses that cancel each other out in the aggregate.

Like the time-series studies, most microeconomic studies of wealth effects focus on the equilibrium behavior of consumers and use cross-sectional data to estimate a relationship between consumption, income and wealth such as the following:

$$\frac{C_{h,t}}{Y_{h,t}} = d_0(z_{h,t}) + d_1(z_{h,t}) \frac{W_{h,t}}{Y_{h,t}} + \varepsilon_{h,t}. \quad (4)$$

$C_{h,t}$  is household consumption,  $Y_{h,t}$  is its non-asset income, which proxies for human wealth, and  $W_{h,t}$  is its non-human wealth. Equation (4) is an approximation to the consumption function that is consistent with the life-cycle model, where rational, utility maximizing agents optimally allocate their resources over their entire life. The functions  $d_0(z_{h,t}^0)$  and  $d_1(z_{h,t}^1)$  denote the marginal propensity to consume out of income and wealth, respectively. They may depend on a set of variables,  $z_{h,t}^0$  and  $z_{h,t}^1$ , including the age

<sup>8</sup> Long time-series are needed for consistency of the estimator due to the properties of co-integration.

<sup>9</sup> Yet, as Poterba (2000) points out, there may be reasons why the marginal propensity to consume out of wealth may vary over time. For example, the marginal propensity to consume out of equity may have fallen over time due to the growing importance of equity investments that are held in retirement accounts. Thaler (1990) argues that households develop "mental accounts" that make them more likely to consume assets that are held in a certain form. Then, they may be more inclined to consume out of directly held assets rather than retirement accounts since the latter are often thought of as long-term assets. Further, institutional changes, such as changes in the costs of leaving a bequest or financial market liberalization, may have modified the relative cost of consuming out of specific types of wealth.



composition of the household, proxies for changes in household needs and in discount factors and so on.  $\varepsilon_{h,t}$  is a residual term, capturing both innovations to permanent income and transitory shocks to current income. Equation (4) should be interpreted as an approximation to a consumption function because in the standard life-cycle model a closed-form solution for consumption can be obtained only under very strong and unattractive assumptions (such as a quadratic utility).

Since, within this framework, identification is based on cross-sectional variation in levels, the estimation of equations such as (4) yields information only about the long-run marginal propensity to consume and has no implications for whether a direct effect occurs in the short run. Furthermore, unobservable variables such as differences in risk aversion or discount factors might vary systematically across the wealth distribution and contaminate estimation of the true relationship between consumption and wealth. A set of controls is generally added to the right-hand-side of equation (4) to control for this unobserved heterogeneity.

To study the link between wealth and consumption, the lack of reliable information on wealth at household level has been such that asset price variables<sup>10</sup> have often been used on the right-hand-side of the baseline model in (4), instead of wealth. When wealth is available, a strategy that has been used in the literature is regressing consumption on the change in the value of asset holdings. However, households that decide to increase their consumption may sell part of their wealth and a simplistic regression would find a spurious correlation between consumption and wealth changes. Therefore, the computation of the *passive component* of the wealth change, i.e. the capital gain, is called for. Including the capital gain, as opposed to the asset price change, allows us to interpret the coefficient in terms of marginal propensity to consume, rather than simple correlation.

To investigate the nature of wealth effects on consumption, equation (4) has been estimated dividing the sample between young and old households, stockholders and non-stockholders, homeowners and renters, and so on. The coefficients across groups can then be compared. If wealth has a *direct effect* on consumer spending and asset price changes imply a change in wealth, price movements should be most relevant for asset holders. Furthermore, under this channel, an increase in house prices can be expected to depress renters' spending if they are saving to buy a house, or even if rents simply move in line with house prices. If present, this effect on renters' spending will weaken the effect of capital gains on aggregate expenditure caused by any positive effect on homeowners' consumption. Alternatively, asset price changes could affect expenditure because they capture *innovations to productivity and income growth*. Under this hypothesis, younger households' consumption can be expected to grow more than that of older households, as a permanent revision to all expected future earnings would be more significant for the young who have longer remaining working lives. Finally, under the *collateral channel*, a rise in house prices would increase the value of the equity available to homeowners and may encourage them to borrow more, in the form of mortgage equity withdrawal, enabling them to finance higher consumption. This effect can be expected to be stronger among younger homeowners, who are more likely to be credit constrained, and among those homeowners who live in areas with higher price inflation. The effect could be negative for renters for whom credit availability is reduced.

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<sup>10</sup> While price series and wealth series are highly correlated (see, for example, Lettau and Ludvigson, 2004), there is some uncertainty when mapping the growth rates of price indexes to the growth rates of (unobserved) individual household wealth. This is bound to introduce measurement error in the analysis of wealth effects on consumption, leading to attenuation bias in the estimated effect. The bias can be expected to be particularly severe for stock prices and stock market wealth, because there is evidence that household portfolios are very heterogeneous and far from fully diversified. Hence, stock market indexes turn out to be a poor proxy for their equity wealth.

Other methodologies have also been used to improve our understanding of the relationship between consumption and wealth using micro data, such as reduced-form regressions for consumption growth (Parker, 1999), tests of the consumption-based capital asset pricing model (Paiella, 2004, and many others), studies of responses to qualitative questions about the wealth effects on spending (Starr-McCluer, 1998), tests based on the correlation between the share of aggregate expenditure devoted to luxury goods and asset prices (Poterba and Samwick, 1995) and studies of the effects of winning a lottery on consumer spending (Imbens, Rubin and Sacerdote, 1999).

#### 4. Wealth effects in time-series data

Most estimates of how wealth affects consumer spending are based on aggregate time-series data and, until very recently, most studies have focused on the stock market or total wealth effect on consumption. The effect of house prices on consumption has largely been considered an incidental issue. As mentioned earlier, most studies focus on the United States where throughout the 1990s the changes in the price of a constant quality home closely mimicked the changes in consumer prices.<sup>11</sup> Furthermore, US households hold large amounts of their wealth in stocks, and gains and losses in the stock market are extremely important in explaining the movements in aggregate wealth (see chart in Ludvigson and Steindel, 1999).

The empirical research on the link between wealth and consumption has generally found evidence of a positive and significant long-run relationship between the two variables. Among recent macroeconomic studies on the US are Ludvigson and Steindel (1999), Mehra (2001), Davis and Palumbo (2001) and Lettau and Ludvigson (2004). All these studies find that a dollar increase in aggregate wealth leads to an increase in aggregate consumption of 3 to 5 cents, a point estimate that is consistent with the early academic work of Modigliani (1971). The magnitude of these estimates is not negligible quantitatively and may explain why it is commonly presumed that sharp swings in asset values will generate changes in consumer spending.

As mentioned earlier, these estimates describe the trend relationship between consumption and wealth. They are not informative about the impact of temporary fluctuations in the growth rate of wealth on future consumption growth. From the estimation of a vector error-correction model for consumption, income and wealth, Ludvigson and Steindel (1999) and Lettau and Ludvigson (2001 and 2004) find that, subsequent to an equilibrium distorting shock, it is wealth, and not consumption or income, that adjusts to restore the long-run equilibrium. In other words, it is wealth growth that exhibits error-correction behavior. The absence of error-correction behavior in consumption does not imply that wealth has no impact on consumption; rather, that spending adjusts *contemporaneously* to *permanent* movements in wealth and income.

One implication of the lack of error-correction behavior in consumption is that conventional estimates of the marginal propensity to consume out of wealth may greatly overstate the response of consumption to a change in wealth. In fact, the estimates of the wealth effect based on parameters of the shared trend in consumption, income and wealth are informative only about the correlation between consumption and *permanent* changes in wealth. If most changes in wealth are not trend movements, but are transitory

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<sup>11</sup> This was not always the case. In fact, in the 1970s and 1980s many of the wealth fluctuations were the result of changing house prices.

movements and are unrelated to consumption, as Lettau and Ludvigson (2004) find, such estimates will exaggerate the true correlation between consumption and wealth.<sup>12</sup>

Fernandez-Corugedo, Price and Blake (2003) find similar evidence for the UK, where, as in the US, directly and indirectly held equity accounts for a large share of household aggregate wealth. Their estimate of the long-run marginal propensity to consume out of total wealth is 0.05. In the dynamics of the system they find that adjustments take place in wealth and not through consumption or income. Further, almost all of the variation in the consumption and income processes appears to be related to permanent shocks. Instead, a substantial part of the fluctuations in non-human wealth is transitory and decoupled from permanent consumption. Tan and Voss (2003) and Fisher and Voss (2004) report qualitatively similar results for Australia.

To the best of my knowledge, to date, there has not been any comparable evidence for economies in continental Europe, except for Germany. Using a new data set of German household wealth, Hamburg, Hoffmann and Keller (2005) estimate that a one-euro permanent increase in wealth leads to a 4-5 cents increase in spending. They also find that consumption does not exhibit error correction behavior. Yet, in stark contrast with what Lettau and Ludvigson report for the US, they find that, subsequent to an equilibrium distorting shock, it is income, and not wealth, that adjusts to restore the long-run equilibrium. Income is also the only variable for which transitory shocks play some role. In comparison to evidence for the US, the transitory component in asset wealth appears to be rather small.

There are several reasons why the transitory component in wealth is small and much smaller than in the US. First of all, Germany's financial system is often characterized as bank-dominated, while in Anglo-Saxon countries capital markets play a much bigger role for a firm's financing decisions. As a result, the German market for both equity and corporate bonds is relatively small and the weight of these two assets in German households' portfolios is limited. Hence, stock price fluctuations hardly affect household wealth at all. Furthermore, the prices of residential real estate, which accounts for a relatively larger share of household wealth, have remained relatively flat over the sample period considered (1980-2003). Thus, income appears to be the driving force behind deviations of consumption, asset wealth and income from their common trends.

Besides being of interest in their own right, the result given by Hamburg, Hoffmann and Keller provide important distinct evidence with respect to those studies that have concentrated on the Anglo-Saxon economies. Germany's financial system is representative of the continental European type of financial system where private stock ownership is much less widespread than in Anglo-Saxon countries and households generally hold large parts of their wealth in the form of relatively illiquid assets, such as housing. The evidence that Hamburg, Hoffmann and Keller present suggests that these differences imply a different transmission mechanism from financial markets to the real economy and, in particular, a different role of asset price fluctuations in relation to consumption.

Ludwig and Sløk (2004) explicitly investigate the implications of the structure of the financial system for the transmission of changes in asset prices to consumption using

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<sup>12</sup> Lettau and Ludvigson (2004) find that the vast majority of the variability in consumption is driven by permanent shocks. Instead, transitory shocks dominate changes in wealth and the transitory (albeit persistent) variation is driven primarily by the volatility of equity prices. Furthermore, the permanent component of consumption is virtually uncorrelated with the transitory component of wealth. Hence, the variation in stock prices does not appear to significantly affect consumption.

a panel of OECD countries. They distinguish between countries with bank-based financial systems (Finland, France, Germany, Italy, Japan, Norway and Spain) and countries with market-based systems (Australia, Canada, Ireland, the Netherlands, Sweden, the United Kingdom and the United States). Although their point estimates are somewhat sensitive to the specification, they find that the responsiveness of consumption to changes in stock prices is higher for the latter group of countries, as expected.

Another multi-country study is Bertaut (2002) who runs individual country, single equation ECM regressions. Her estimates of the marginal propensity to consume out of financial wealth show a large variation: from 10 cents per dollar for Canada and Japan, to 6 cents per dollar for the US, and 2.7 cents per euro for France. There also appears to be large cross-country dispersion in the marginal propensity estimates of Labhard, Sterne and Young (2005), which are obtained from structural VARs on individual country data. Structural VARs have the advantage of explicitly allowing for feedback effects from consumption to wealth, something that the single-equation studies of Ludwig and Sløk and of Bertaut cannot address. Labhard, Sterne and Young (2005),’s estimates of the marginal propensities to consume out of total wealth range between 1 and 5 percent for most euro-area countries. The corresponding values for the US and Canada fall in the lower end of this range. However, when focusing on equity wealth, the *mpc* for the US and that for Canada are much higher than the *mpc* of most European countries.

There is little theoretical rationale for the wide cross-country dispersion of the *mpc* estimates reported by these multi-country studies. The extent of the cross-country differences appears to be particularly large when compared with those of calibrated models, such as the IMF’s MULTIMOD (see Faruqee *et al.*, 1998). In calibrated models, the *mpc* out of wealth is based on deep parameters such as the intertemporal elasticity of substitution in consumption, the real interest rate, the probability of death and taxation. Hence, these *mpc* estimates provide a theory-consistent guide to reasonable values that one might expect for the marginal propensities to consume. Overall, these estimates tend to be similar across countries, because most of their determinants are the same. They range between 5 and 8 percent. The highest values are for Canada and the US; the values for the euro area are somewhat lower.

The cross-country differences in empirical estimates most likely reflect differences in the measurement of wealth across countries and a failure to account for differences in the nature of the shocks to consumption and wealth. Labhard *et al.* verify this hypothesis using Pesaran, Shin and Smith (1999) panel technique on an OECD sample of homogeneous data on eleven countries. They find that the hypothesis of common long-run *mpc* cannot be rejected and obtain a plausible estimate of the marginal propensity to consume out of financial wealth of 6 percent, which is broadly consistent with estimates used in a wide range of policy models. The short-run adjustment coefficients, which are allowed to vary across countries, exhibit instead substantial heterogeneity. However, appraising the extent of the across-country differences in the speed of adjustment is problematic because of the use of a single-equation framework.

Tables 1 and 2 summarize the evidence reported in the papers cited in this section and in the next.

Table 1

**Total wealth effects on consumption in aggregate data:  
marginal propensities to consume (mpc) and elasticities**

	Sample period	US	UK	GE	AU	CA
<i>Ludvigson and Steindel (1999)</i> .....	1953-1997					
mpc .....		0.046	-	-	-	-
elasticity .....		0.29	-	-	-	-
<i>Lettau and Ludvigson (2004)</i> .....	1951-2003					
mpc .....		0.046	-	-	-	-
elasticity .....		0.30	-	-	-	-
<i>Davis and Palumbo (2001)</i> .....	1960-2000					
mpc .....		0.039	-	-	-	-
elasticity .....		0.19	-	-	-	-
<i>Mehra (2001)</i> .....	1960-2000					
mpc .....		0.030	-	-	-	-
elasticity .....		0.14	-	-	-	-
<i>Fernandez-Corugedo et al. (2003)</i> .....	1975-2000					
mpc .....		-	0.050	-	-	-
elasticity .....		-	0.25	-	-	-
<i>Tan and Voss (2003)</i> .....	1988-1999					
mpc (total wealth <sup>(1)</sup> ) .....		-	-	-	0.040	-
elasticity .....		-	-	-	-	-
<i>Hamburg, Hoffmann and Keller (2005)</i>	1980-2003					
mpc .....		-	-	0.044	-	-
elasticity .....		-	-	0.31	-	-
<i>Bertaut (2002)</i> .....	(2)					
mpc .....		0.054	0.043	-	0.049	0.083
elasticity .....		0.29	0.20	-	0.22	0.41
<i>IMF MULTIMOD (Faruqee et al., 1998)</i>	(3)					
mpc .....		0.082	0.068	0.056	-	0.078

(1) Tan and Voss's wealth measure is gross of household debt. (2) Bertaut's sample for the US runs from 1960 to 2000; that for the UK, from 1970 to 2000; that for Australia from 1981 to 1999; and that for Canada from 1976 to 2000. (3) Figures based on calibration.

Table 2

**Financial and non-financial wealth effects on consumption in aggregate data:  
marginal propensities to consume (mpc) and elasticities**

	Sample period	US	UK	DE	AU	CA	FR	IT	JAP
<i>Labhard, Sterne and Young (2005)</i> .....	1970-2002								
mpc (net financial wealth) <sup>(1)</sup> .....		0.037	0.056	0.078	-	0.078	0.080	0.028	0.042
elasticity (net fin. wealth) <sup>(2)</sup> .....		0.12	0.16	0.13	-	0.19	0.10	0.08	0.16
<i>Case, Quigley and Shiller (2005)</i> .....	(3)								
mpc (housing) <sup>(4)</sup> .....		0.04	-	-	-	-	-	-	-
elasticity (housing) .....		0.62	0.14	0.14	-	0.14	0.14	-	-
<i>Ludwig and Sløk (2004)</i> ....	1985-2000								
mpc (equity).....		0.018	0.013	0.019	0.023	0.023	0.014	0.03	0.013
elasticity (equity) .....		0.08	0.08	0.03	-	0.08	0.03	0.03	0.03
mpc (housing) <sup>(5)</sup> .....		0.031	0.021	0.011	-	-	0.010	0.009	-
elasticity (housing) .....		0.04	0.04	0.02	-	0.04	0.02	0.02	0.02
<i>Bertaut (2002)</i> .....	(6)								
mpc (financial wealth).....		0.059	0.042	-	-	0.097	0.027	-	0.106
elasticity (financial wealth)		0.23	0.09	-	-	0.16	0.10	-	0.29
mpc (non-financial wealth)		0.097	0.042	-	-	-	-	-	-
elasticity (non-fin. wealth)		0.14	0.09	-	-	0.16	-	-	-
mpc (equity).....		0.062	-	-	-	0.087	-	-	-
elasticity (equity) .....		0.10	0.16	-	-	0.14	-	-	-
<i>Dvornak and Kohler (2003)</i> .....	1984-2001								
mpc (equity).....		-	-	-	0.060-0.090	-	-	-	-
elasticity (equity) .....		-	-	-	-	-	-	-	-
mpc (housing).....		-	-	-	0.030	-	-	-	-
elasticity (housing) .....		-	-	-	-	-	-	-	-

(1) Labhard *et al.*'s mpc estimates are averages of estimates obtained using different specifications: five and six variable VARs in levels, adapted from Lettau, Ludvigson and Steindel (2002), and tri-variate VARs in levels and differences. (2) The elasticities are computed by multiplying the mpc estimates by the 2001-02 wealth-consumption ratios. Figures taken from Altissimo *et al.* (2005). (3) Case, Quigley and Shiller's US state panel runs from 1982 to 1999 (quarterly data); the international panel covers 14 countries during the period 1975-1996 (annual data). (4) The mpc is computed by multiplying the estimated elasticity by the 2001-02 wealth-consumption ratio. Figure taken from Altissimo *et al.* (2005). (5) The mpcs are computed by multiplying Ludwig and Sløk elasticity by housing wealth as a share of GDP in 2000. (6) Bertaut's sample for the US runs from 1960 to 2000; that for the UK, from 1970 to 2000; that for Australia from 1981 to 1999; and that for Canada from 1976 to 2000.

#### 4.1 Housing wealth

The evidence of a housing wealth effect on consumption is rather scarce, especially that based on time-series data. Further, the literature differs in its views as to the relative role of housing effects over time and across countries and the results are often inconclusive. The main cause seems to be data deficiencies which undermine the effort to detect any such effect. Theoretical reasons may also explain why aggregate data may be unsuitable to explore housing wealth effects on consumption.

A widely cited study of housing wealth effects is Case, Quigley and Shiller (2005), whose estimated elasticities of consumption to housing wealth are significantly different from zero and substantially larger than the estimated elasticities to stock market wealth for both a panel covering 14 developed countries and a panel of US states. The *mpcs* out of housing wealth that Case, Quigley and Shiller's estimated elasticities imply vary from around 8.5 cents per euro for Germany and 6 for France and Italy to 4 cents per dollar for the United States.<sup>13</sup> Also Bertaut (2002) finds a positive, significant housing wealth effect for the US and for the UK, but not for Canada. For the US, the elasticity is 0.10, which implies an *mpc* of 9.7 cents per dollar; for the UK, the elasticity is also 0.10 and the *mpc* is 4.2 pence per pound. For these countries, Bertaut's estimates of consumption responses are similar for both financial and non-financial wealth. Dvornak and Kohler (2003) find that housing significantly affects Australian household consumption as well. Their *mpc* out of stock market wealth is two-to-three times that out of housing wealth. However, the implications for aggregate consumption are similar because housing assets are three times as large as stock market assets. Evidence of significant housing wealth effects is also provided by Ludwig and Sløk (2004), who use housing market price indexes.

In the case of housing, and in contrast to financial wealth, there are reasons why there might be systematic differences across countries in the response of consumption to price shocks. To the extent that housing price shocks affect consumption in the *short run* through their impact on mortgage equity withdrawal, one may expect the effect to be more pronounced where households are more severely credit constrained and where it is easier and cheaper to re-mortgage and move house (see Aoki, Proudman and Vlieghe, 2001, for a simulation for the UK). However, overall in the long run it is less clear that changes in aggregate house prices will lead to changes in aggregate consumption. Houses are different from other assets for two reasons. First, people generally live in their house and benefit directly from the services provided by their home. So, the advantage of an increase in house prices is immediately offset by an increase in the opportunity cost of housing. Second, houses are not usually traded internationally. In consequence, homeowners in aggregate cannot sell their home and realize the capital gains. Overall, the gains of the sellers will be offset by the losses of the first-time buyers. Thus, there is no traditional *direct* wealth effect on consumption from housing. Further, owners and renters responses may counterbalance each other and cancel out in the aggregate. On the other hand, a positive shock to permanent income would be expected to boost consumption of both housing and non-housing goods, but if house prices are more flexible than prices of other goods, house prices would seem to Granger-cause consumption. Hence, overall aggregate data may not be sufficient to evaluate the effect that changes in housing wealth

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<sup>13</sup> Estimates taken from Altissimo *et al.* (2005) who back out individual countries' marginal propensities to consume out of housing wealth by multiplying Case, Quigley and Shiller's estimated elasticities by individual countries' consumption-to-housing ratios.

may have on consumer spending.<sup>14</sup>

## 5. Household-level evidence of wealth effects

The microeconomic evidence of wealth effects is relatively recent and is intended to shed light on the household behavior underlying the relationship between wealth and consumption. As explained earlier, individual-level data allow us to distinguish the relative roles of the alternative hypotheses explaining the aggregate relationship. Nevertheless, the evidence on the household-level underpinnings of wealth effects is still limited, which partly reflects the lack of good data to explore the question. The ideal data set should provide a comprehensive measure of household consumption, in order to determine the quantitative importance of wealth effects, and detailed data on household balance sheets, at frequent intervals and over a sufficiently long period of time to explore a rich set of asset price movements.

Among the recent papers estimating the marginal propensity to consume out of wealth using micro data is Parker (1999) who finds that the relationship between US household consumption and wealth is positive and significant. His *mpc* estimate is approximately 4 percent. Since identification is based on cross-sectional variation in levels, Parker's findings yield information only about the long run and cannot indicate if a direct wealth effect occurs in the short run. Furthermore, unobservable variables such as differences in risk aversion or discount rates may vary systematically across the wealth distribution and contaminate the *mpc* estimate.

To overcome the problem of cross-sectional identification, Dynan and Maki (2001) estimate the model in first difference. Their results imply that the aggregate relationship between consumption and stock market wealth is consistent with a *direct* view of the wealth effects, in which changes in aggregate consumption stem from changes in the consumption of households that own stocks. They also rule out any important indirect wealth effect, because the consumption growth of households with no equity has little correlation with movements in stock prices. Dynan and Maki's estimates of the marginal propensity to consume out of stock market wealth range between 5 and 15 percent. The high values are probably due to the fact that their sample (like Parker's) excludes high income households. Indeed, analytic results by Carroll and Kimball (1996) and numeric simulations by Zeldes (1989) show that the consumption function is concave. Thus, the marginal propensity to consume out of wealth is lower for households with more resources. Empirical support for such concavity is found by Parker (1999) and also by Dynan, Skinner and Zeldes (2004).

Also Maki and Palumbo (2001) provide strong evidence supporting the hypothesis of a direct wealth effect on US household consumption during the 1990s. They find that those households whose portfolio was boosted the most by the exceptional stock market performance are the same households whose savings fell the most in the second half of the 1990s. Households with limited amounts of equity, who experienced relatively modest capital gains, continued to save at the same rate. Further, they show that the size of the wealth effect experienced by the households in the uppermost quintile of the income distribution is large enough to give a basic explanation for all the decline in the aggregate saving rate observed in the 1990s.

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<sup>14</sup> Other recent papers distinguishing between housing and financial wealth are Boone and Girouard (2002), who study the impact of wealth on consumption across the G7 countries, and Pichette and Tremblay (2003) who focus on Canada.



Table 3

**Wealth effects in survey data**

	Country/Data	Sample period	<i>mpc</i>	<i>elasticity</i>
<i>Parker (1999)</i> .....	US/PSID <sup>(1)</sup> and CEX <sup>(2)</sup>	1984-1994		
Total wealth .....			0.04	-
<i>Dynan and Maki (2001)</i> .....	US/CEX <sup>(2)</sup>	1983-1999		
Equity .....			0.05-0.15	-
<i>Maki and Palumbo (2001)</i> .....	US/FFA <sup>(3)</sup> and SCF <sup>(4)</sup>	1989-1998		
Total wealth .....			0.03-0.05	-
<i>Bostic, Gabriel and Painter (2005)</i> .	US/SCF <sup>(4)</sup> and CEX <sup>(2)</sup>	1989-2001		
Financial wealth.....			-	0.02
Housing .....			0.02 <sup>(5)</sup>	0.06
<i>Juster et al. (2006)</i> .....	US/PSID <sup>(1)</sup>	1984-1994		
Equity .....			0.19	-
Housing .....			0.03 <sup>(6)</sup>	-
<i>Morris (2007)</i> .....	US/PSID <sup>(1)</sup>	1989-2003		
Housing .....			0.01-0.15	-
<i>Disney, Henley and Jevons (2003)</i> ...	UK/FRS <sup>(7)</sup>	1993-2001		
Housing .....			0.09-0.14	-
<i>Attanasio et al. (2005)</i> .....	UK/FES <sup>(8)</sup>	1978- 2001/2		
Housing .....			-	0.04-0.21
<i>Campbell and Cocco (2005)</i> .....	UK/FES <sup>(8)</sup>	1988-2000		
Housing .....			-	1.2
<i>Bover (2005)</i> .....	Spain/EFF <sup>(9)</sup>	2002		
Housing .....			0.02	-
<i>Guiso, Paiella and Visco (2006)</i> .....	Italy/SHIW <sup>(10)</sup>	1991-2002		
Financial wealth.....			0.04	-
Housing .....			0.02	-
<i>Paiella (2007)</i> .....	Italy/SHIW <sup>(10)</sup>	1991-2002		
Total wealth .....			0.04	-
<i>Sierminska and Takhtamanova (2007)</i>	LWS <sup>(11)</sup>	-		
Financial wealth.....			-	0.02-0.04
Housing .....			-	0.10-0.14

(1) Panel Study of Income Dynamics. (2) Consumer Expenditure Survey. (3) Flow of Funds Accounts. (4) Survey of Consumer Finances. (5) Estimate of Morris (2006) based on the PSID. (6) The estimate is statistically indistinguishable from zero. (7) Family Resources Survey. (8) Family Expenditure Survey. (9) Survey of Spanish Household Finances. (10) Survey of Household Income and Wealth. (11) Luxemburg Wealth Study. Harmonized data on Canada, from the 1999 Survey of Financial Security, Finland, from the 1998 Household Wealth Survey, and Italy, from the 2002 Survey of Household Income and Wealth.

Paiella (2007) provides comparable evidence for Italy where wealth effects have however been smaller than in the US. This is partly due to Italian households' smaller holdings of stocks and financial wealth in general, despite similar *mpc*. More importantly, she finds that wealth effects in Italy are unlikely to be direct. Indeed, although aggregate saving rates fell, those of stockholders, who enjoyed most capital gains, remained basically unchanged. Italian stockholders, in contrast with American stockholders, continued to save and invest heavily in stocks instead of cashing in their capital gains. These findings seem to suggest that stockholders are influenced by a positive feedback effect, through which higher recent returns encourage higher investment.<sup>15</sup>

Table 3 summarizes the evidence reported in the papers cited in this section and in the next.

### 5.1 House price effects

The recent house price increases have renewed interest in the effect that changes in the value of housing wealth may have on household expenditure. The interest in housing wealth effects is also due to the fact that real estate and housing investment is widespread and for many households it is the most important component of their wealth.<sup>16</sup>

One of the first papers explicitly examining the relationship between consumption and house prices using micro data is Attanasio and Weber (1994). These authors investigate whether the financial liberalization in the 1980s was responsible for the UK house price and expenditure booms. More specifically, they test the common causality hypothesis against the possibility that the consumption growth may reflect a direct wealth effect caused by higher real estate prices and conclude in favor of the former explanation. Attanasio *et al.* (2005) updated and extended this work and confirm the main findings supporting the common causality hypothesis.<sup>17</sup> These results contrast sharply with those of Campbell and Cocco (2007) who also look at the UK and find that the wealth effect from house prices to consumption operates to a large extent through an easing of borrowing constraints. There are also significant differences between the estimates. Campbell and Cocco argue that a 1 percent increase in house prices leads to a 1.2 percent increase in consumption, with an even higher elasticity for older homeowners. Attanasio *et al.*'s consumption response estimate is much smaller, between 0.21 and 0.04 percent

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<sup>15</sup> Choi *et al.* (2004) find evidence of a similar effect using administrative records on over 40,000 401(k) accounts. Contrary to the theory, they estimate a negative marginal propensity to consume out of idiosyncratic 401(k) capital gain shocks and conclude that 401(k) participants increasingly behave in ways that have been associated with high rewards in the past.

<sup>16</sup> Focusing on real estate has an additional advantage over the studies of capital gains on equity. Most surveys on household portfolios only report whether households own stocks and the overall amount, but they do not usually provide detailed information on the types of stocks held. Therefore, in order to compute capital gains one has to assume that each household holds the stock market and use stock market indexes to compute price changes in individual portfolios. This is bound to introduce measurement error because stockholders generally only invest in a small number of stocks. In consequence, capital gains computed at the household level may not be a good proxy for actual capital gains, leading to attenuation bias in the estimated effect on consumption. These problems are generally not shared by data on housing prices, which tend to be available with a geographical breakdown, allowing house prices to be matched with household-specific real estate, therefore reducing the error when computing individual household gains and losses.

<sup>17</sup> Attanasio *et al.* (2005)'s conclusion is based on the finding that the relationship between house prices and consumption is more closely linked for younger than older households. Under the wealth and collateral hypotheses, an increase in the price of a homeowner's house increases the value of their wealth/collateral and reduces the expected net future wealth of non-owners (who are more likely to be young), as rents are likely to increase. In contrast, under the common causality hypothesis, we expect a co-movement between house prices and expenditure for both owners and renters. This explanation is associated with a permanent upward revision of all expected future earnings, which would benefit the youngest households whose remaining working lives are longer.

depending on the age group. Although both papers use the same dataset, there are two significant practical differences in the methodologies. First, Campbell and Cocco rely on a reduced-form regression for analyzing cohorts' consumption growth, while Attanasio *et al.* use a permanent income hypothesis. Second, Campbell and Cocco's sample period starts in 1988, whereas Attanasio *et al.*'s starts in 1978 and it is likely that the wealth and collateral channel are important for different households at different points in time.

Another paper focusing on the UK is Disney, Henley and Jevons (2003) who provide estimates of household marginal propensity to consume out of housing wealth ranging between 0.09 and 0.14. Furthermore, consumption responses appear to be asymmetric with the impact of house prices being stronger when prices are rising and the effect being greater for households with zero or negative home equity.<sup>18</sup>

The micro evidence on the link between house prices and expenditure in the US is limited. Most analyses carried out in the 1990s, such as Skinner (1989, 1996) and Engelhardt (1996), suggest at best a weak relationship between house price changes and non-housing consumption. More recently, Juster *et al.* (2006) find that over the period 1984-1994 the effect is null. On a different data set, Bostic, Gabriel and Painter (2005) estimate a home value elasticity of about 6 percent which translates into an *mpc* out of capital gains of around 0.02. Morris (2007) ascribes these papers' findings of small or insignificant effects to the restriction of a constant (across households) coefficient on capital gains. In her work she allows responses to housing gains to vary by age and finds an *mpc* out of capital gains of -0.15 for the young, between 0.01 and 0.05 for the middle-aged and of 0.13 for the over fifties.

Other studies of the impact of housing wealth on consumption are Paiella (2007) and Guiso, Paiella and Visco (2006) who find that housing market effects, as captured by the marginal propensity to consume,<sup>19</sup> are small also in Italy, smaller than liquid asset market effects. When distinguishing between homeowners and renters, Guiso, Paiella and Visco find that responses differ: while homeowners' marginal propensity to consume out of real value changes in housing wealth is positive and close to 0.035, renters' is negative and counteracts the homeowners' effect on aggregate consumption, even if their response cannot be estimated with great statistical precision. Bover (2005) examines Spain and estimates the marginal propensity to consume out of housing wealth to be around 0.015 vs. insignificant financial wealth effects. Finally, in a recent cross-country study Sierminska and Takhatamanova (2007) provide additional evidence of significant housing wealth effects for Canada, Finland and Italy and find substantial differences in the size of the effects between countries.

## 6. Concluding remarks

This paper examines the literature on the link between stock and house prices and consumer spending. Overall, most studies agree that there is a statistically significant relationship between these variables. There is much less agreement as to the size of the correlation and the nature of the channel through which changes in wealth affect consumption. The estimates vary depending on whether aggregate or micro data are employed. Aggregate data-based values are generally higher than micro data-based ones,

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<sup>18</sup> An explanation of this result is that negative home equity induces precautionary savings so that house price inflation that lifts households out of negative equity induces a disproportionately large consumption response.

<sup>19</sup> The elasticity of consumption with respect to housing wealth tends to be larger than the elasticity with respect to liquid asset wealth because housing accounts for a substantially larger share of household wealth.

which partly reflects the fact that household surveys tend to under-sample higher net worth individuals whose marginal propensity to consume out of wealth is lower than average. The estimates tend also to be asset-specific, which may be due to mental accounts or preferences for accumulating wealth in a specific form for tax, bequest or other reasons. Further, there appear to be large differences across countries, for which there is limited theoretical rationale. In fact, most *mpc* determinants, such as the intertemporal elasticity of substitution in consumption, the real interest rate, the probability of death and taxation, are similar across countries. The differences most likely reflect differences in the measurement of wealth across countries and a failure to account for differences in the nature of the shocks to consumption and wealth.

The estimates of the marginal propensity to consume out of wealth tend to be larger among Anglo-Saxon households than among European ones. This together with a higher wealth-to-consumption ratio implies that the elasticity of consumption to wealth is much higher among the former. As to the housing wealth effect relative to the stock market wealth effect, the evidence suggests that the impact of a change in house prices on aggregate expenditure is at least as large as that of stock prices. This is due to the diffusion of real estate holdings across households and despite the fact that most studies find that the *mpc* out of housing wealth is smaller or, at most, the same as the *mpc* out of equity.

Regarding the nature of the correlation between wealth and consumption, generally wealth effects appear to be direct in the US where asset holders have been the ones whose expenditure has changed the most as asset prices have fluctuated. For other countries the evidence points toward other channels and varies depending on the asset being considered. Recent studies have also pointed out important differences in the transmission mechanism of equilibrium-distorting shocks. In Anglo-Saxon countries asset price fluctuations are behind most deviations in consumption, wealth and income from their common trend. After a shock, it is wealth that adjusts to restore the equilibrium. Instead, in those European countries with bank-based (as opposed to market-based) financial systems, transitory shocks only appear to be significant for income, which is also the variable that adjusts in the case of deviations from the equilibrium. Hence, it seems important for policymakers to allow for individual country heterogeneity when appraising the policy implications of a change in asset prices.

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## DISCUSSION OF THE PAPER BY M. PAIELLA

*Franco Peracchi\**

The paper discusses a very important topic, namely the magnitude and the sources of the “wealth effect” on consumer spending. It is a very useful survey because it covers research carried out in this area after the survey by Poterba.<sup>1</sup> My discussion touches briefly upon three sets of issues that, largely for reasons of space, the paper itself does not treat.

### 1. General issues

The first issue is timing. As argued by Poterba (2000), “the central issue in analyzing wealth effects is timing. If the lag between a favourable shock to household balance sheets and an increase in consumption spending takes many years to develop, then stock market fluctuations may have a limited impact on aggregate spending”. This issue, buried into the finite-order lag operator  $B(L)$  in equation (2), is clearly important both theoretically and empirically.

The second issue is that, in general, wealth shocks should cause both consumption and labor supply responses. These labor supply responses are likely to be the driving force behind the movements of log-per capita disposable income  $y_t^d$  in equation (1) and in the vector autoregression (2). Further, it may be useful to distinguish between labor supply responses on the intensive and the extensive margins (e.g., do wealth effects induce retirement?).

The third issue is which wealth concept should be used. Results may change a lot depending on whether one uses a narrowly defined concept or a more broadly defined concept that includes pension wealth or even human wealth (education, job market experience, health).

The fourth issue is heterogeneity of the wealth effect, namely the fact that the wealth effect may differ for different categories of consumption expenditure (e.g. nondurables, services, durables). A related question is the precise definition of the various consumption categories (e.g., whether the user value of housing should be included).

It is important to recognize that these general issues may be handled differently at the macroeconomic and the microeconomic levels.

### 2. Macroeconomic issues

Empirical analysis at the macroeconomic level is difficult, partly because of the poor quality of the existing macroeconomic time series and partly because the available empirical evidence is limited to a few countries. However, there are also several unresolved theoretical issues.

First, concentration of ownership differs across asset categories. For example, ownership of stocks is much more concentrated than ownership of residential housing.

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<sup>1</sup> Poterba, J. (2000), “Stock Market Wealth and Consumption”, *Journal of Economic Perspectives*, Vol. 14, pp. 99-118.

This implies that the same aggregate wealth shock may produce very different effects on aggregate consumption depending on the asset categories involved.

Second, using long-time series raises issues concerning the stability of the model parameters. To illustrate this, consider the following simplified life-cycle budget constraint

$$\Delta W + \sum_{t=0}^T \beta^t \Delta E_t = \sum_{t=0}^T \beta^t \Delta C_t + \Delta B,$$

where  $\beta = (1 + r)^{-1}$ ,  $r$  is the after-tax real interest rate,  $E_t = \omega_t H_t$  are earnings,  $\omega_t$  are real wages,  $H_t$  is labor supply and  $B$  is planned bequest. If real wages and labor supply are fixed (difficult to assume over the long-run, perhaps) and  $C_t = C$  for all  $t$  (perfect consumption smoothing), then

$$\frac{\Delta C}{\Delta W} = \frac{1}{\sum_{t=0}^T \beta^t} \left( 1 - \frac{\Delta B}{\Delta W} \right).$$

If  $r = 0$  and  $\Delta B / \Delta W = 0$ , then

$$\frac{\Delta C}{\Delta W} = \frac{1}{T},$$

that is, the wealth effect is inversely related to residual life expectancy. This relationship would suggest a long-run attenuation of the wealth effect in developed countries just because of the dramatic increase in life expectancy. Is there any evidence of this?

Third, unobserved heterogeneity is another important issue, because risk aversion, discount factors, survival prospects, etc., are all likely to vary systematically across households.

### 3. Microeconomic issues

At the microeconomic level, there is a “fundamental endogeneity problem” (Poterba, 2000) in studying wealth and consumption changes: wealth changes largely reflect household choices (for example, household saving and investment decisions in prior periods). This implies that it is not clear how to interpret differences in the coefficients of the OLS regression estimated for different groups, such as stockholders and nonstockholders or homeowners and renters, as being a stockholder or a renter is largely the result of choice.

To make things even more complicated, most of the available evidence is cross-sectional. Unfortunately, cross-sectional variation may at best provide information about long-run relationships. In fact, it is likely to mix together different effects: cohort effects (e.g., cohort differences in financial literacy), the effects of including households at very different stages of their life-cycle, etc. To capture the dynamic response of consumption to wealth shocks, long panel data would be necessary. They are not currently available. Even if they were, I would anticipate major problems due to panel attrition.

Finally, I would like to point out the large amount of measurement error in the housing wealth held by household, due to unobservable heterogeneity in the housing stock. What are the likely effects of this?

# THE EFFECTS OF HOUSING AND FINANCIAL WEALTH ON PERSONAL CONSUMPTION: AGGREGATE EVIDENCE FOR ITALIAN HOUSEHOLDS

Antonio Bassanetti\* and Francesco Zollino\*

## 1. Introduction

The sizeable rise in house prices that started during the nineties in all main industrial countries – with the important exceptions of Germany and Japan – and in the largest emerging economies (IMF, 2004) has led to fresh interest in the empirics of wealth effects on consumption amid rapid innovation in financial markets. Differently from received theoretical literature, the debate is centred on the different channels through which housing as opposed to financial assets may affect consumer spending and, combined with residential investment, aggregate demand as a whole. Interest in this issue has gained further momentum recently, given the financial turmoil that show up in August 2007 in the US sub-prime mortgage market that triggered liquidity distress in financial markets at a global level. The wide implications for monetary policy are also revealing, as “*the uncertainty around housing-related monetary transmission mechanism provides one further reason why monetary policy will continue to be an art, albeit one that makes use of science*” (Mishkin, 2007).

Indeed the question is not simple as certified by the controversial results in the available empirical literature, despite the recently prevailing view in favour of a significant and large housing wealth effect whose size, compared with financial assets, seems to change according with country specific factors.

In this paper we focus on the recent experience of the Italian economy, where wealth accumulation seems to outperform international comparison. At the same time, the research effort aimed at the possible link with consumer spending has not been as intense as in other advanced economies. To the best of our knowledge, recently only Guiso, Paiella and Visco (2005), using the micro data of the *Survey of Households Income and Wealth* run biannually by the Bank of Italy, has focused on this issue. There is instead a substantial lack of research based on macro analysis, where more emphasis has been put on the different contributions coming from pension and non-pension wealth rather than from financial and non-financial assets.

We contribute to the debate by looking at the Italian aggregate time series to estimate the link between consumption, financial and housing wealth over a 27-year sample period (1980-2006), controlling for the role of income and common exogenous drivers, such as the brisk drop in interest rates on the eve of European Monetary Union. For this purpose, we have exploited cointegration analysis to study the long run relationships between the variables involved.

The empirical literature often interprets the coefficients of such relationships as long run elasticities of consumption with respect to income and wealth. Though this practice is quite convenient, these parameters summarize the correlation between the *permanent* movements in the aggregates, because they are based on the existence of a common stochastic trend. On the contrary, they are not indicative at all of the link between households spending and transitory fluctuations in income and wealth. As a

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\* Bank of Italy. The authors gratefully acknowledge the valuable research assistance provided by Pamela Minzera and Salvatore Muzzicato.

consequence, as first suggested by Lettau and Ludvigson (2004), once we have estimated the long run correlation among the variables of the system, we need to assess whether there exists (transitory) movements in income and wealth that are not associated with (permanent) changes in consumption. This will allow a correct reading of the cointegrating vector.

Given the increasing relevance of this issue in recent literature, we have adopted the variance decomposition approach put forward by Gonzalo and Ng (2001) to assess the share of quarterly fluctuations which are due, respectively, to permanent and transitory shocks. This can be done easily by exploiting the information directly available from the estimated VECM for Italy. This accomplished, we have all the necessary information to correctly interpret our cointegration outcomes. Among the main results we find a long run marginal propensity to consume in the range, respectively, of 1.5-2 and 4-6 cents out of each Euro increase in housing and financial wealth.

This paper is organized as follows. Section 2 describes some stylized facts about recent developments in the Italian economy, with a particular focus on the household propensity to save and on the housing market. Section 3 delivers a summary of the theoretical predictions about wealth effects, followed in Section 4 by a review of empirical evidence available for Italy. After sketching the theoretical set-up adopted for our analysis (Section 5), we describe the data set and report upon the preliminary analysis (Section 6). Main empirical results are presented in Section 7, followed by a variance decomposition exercise (Section 8). The final section presents a brief conclusion.

## 2. Searching for stylized facts in Italy

The propensity of Italian households to save had long been particularly high among industrial countries, being still on the rise in the early eighties (Figure 1). Since then, it has shown a brisk deterioration that, apart from a temporary break between 1995 and 1997, has gradually brought the saving rate down to a low of 10 per cent by the end of the nineties. At the beginning of the current decade, private savings first showed a partial recovery, then resumed their negative trend; at the end of last year they were around 10 per cent of disposable income of consumer households.

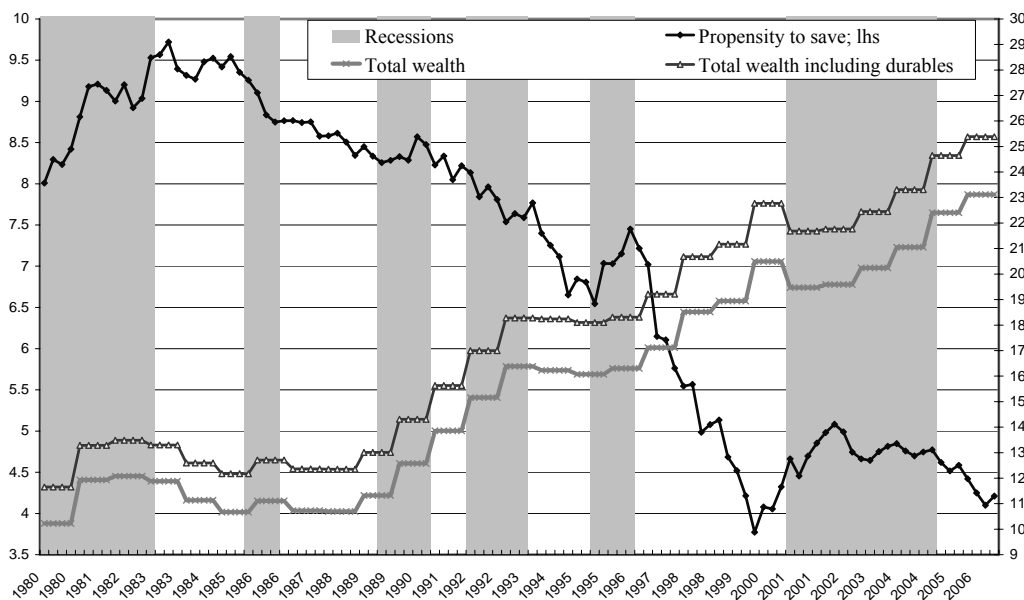
Looking for explanations of recent developments, a first candidate is a trend reversal in key factors that had previously sustained high personal savings, namely the high productivity performance that drove up income expectations and lagging capital markets which prevented the scope for consumption smoothing (Guiso, Jappelli and Terlizzese, 1994). On one side, since the middle of the nineties the productivity trend has turned negative (Bassanetti *et al.*, 2004), plausibly curbing consumer spending in the medium term; on the other, the development of the capital markets accelerated with progress in financial liberalization at domestic level and European integration, peaking at the start of monetary union in 1999, and plausibly alleviated liquidity constraints for Italian households. These forces might have offset the demand for precautionary saving that probably originated from increased economic uncertainty amid a sequel of reforms in social security and labour markets, that began in the early nineties.

The recent drop in personal saving went in association with a brisk acceleration in real and financial wealth held by consumer households. Following broad stability throughout the eighties, their total wealth to income ratio soared from around 5 at the start of the recession in 1992 up to 7 in 2000, eventually peaking at 7.8 at the end of last year

(Figure 1).<sup>1</sup> Based on a tentative exercise in which we have disentangled the main contributors to changes in financial and housing wealth, it seems that since the start, in 2000, of a prolonged economic stagnation the deliberate investment of savings on the part of consumer households has explained an increasing part of the accumulation in financial assets (Figure 2).<sup>2</sup> This result occurred despite a negative performance in asset prices – which apparently caused a huge devaluation in financial wealth – pointing to the possibility that a precautionary motive gradually gained momentum to drive up equity stock as a buffer against an uncertain long-term perspective. At the same time, the savings channelled to the residential market have kept increasing, even if playing a very minor role in driving very fast growth in housing wealth, as long as the positive trend in house prices markedly accelerates.

Figure 1

### Propensity to save and wealth income ratio

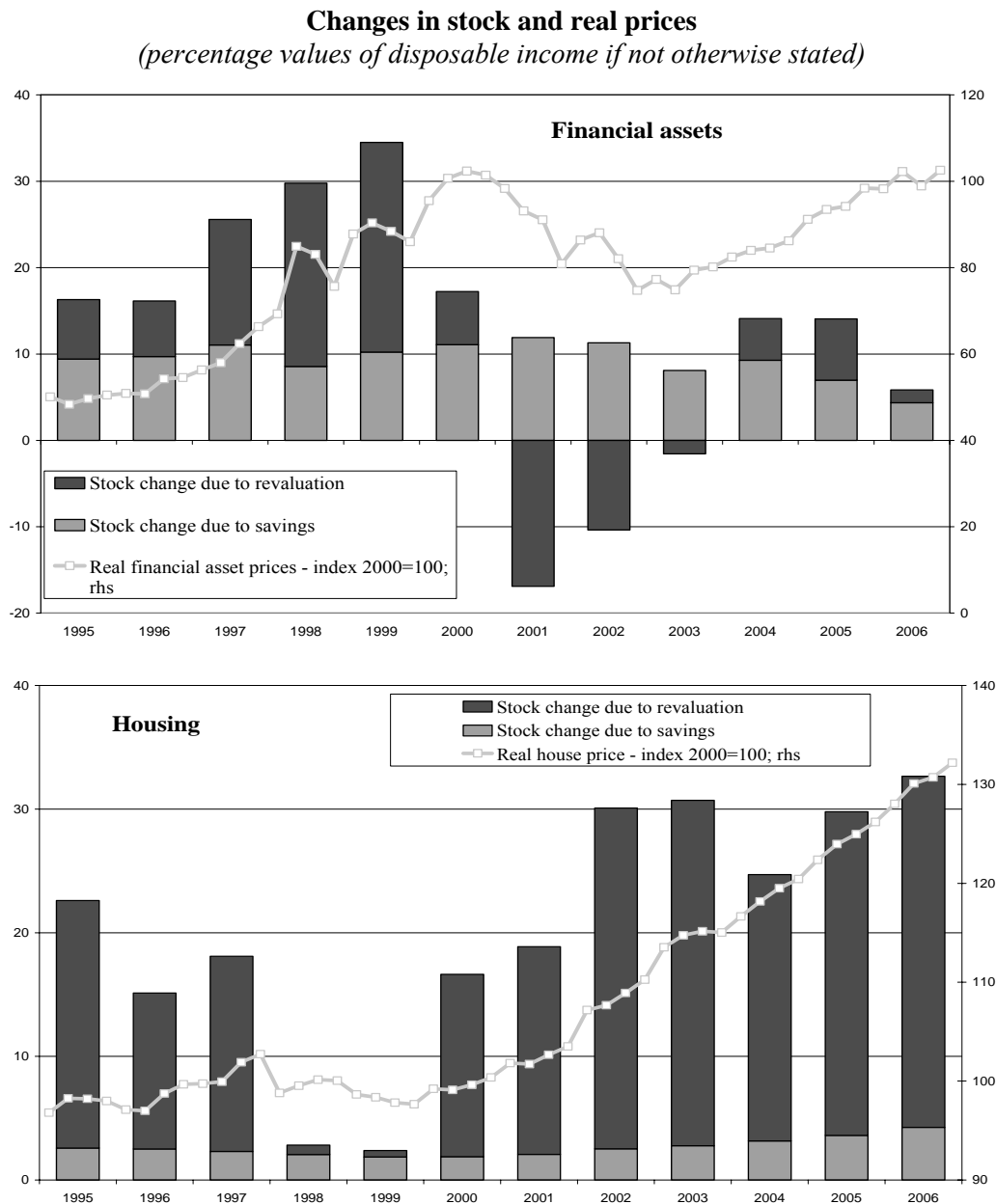


Sources: Elaborations based on data from Istat and the Bank of Italy.

<sup>1</sup> If durable stock is included, over the whole period, total wealth climbed from 5.5 to 8.6 as a ratio of disposable income of consumer households.

<sup>2</sup> In the exercise, the revaluation of financial assets is estimated by the quarterly difference between changes in stock and the value of flow, as the latter reasonably accounts for sole saving/investment transactions. Alternatively, we have first constructed a weighted price index of equities and bonds held by Italian households (the same which in Figure 1 is shown net of consumption inflation), then we have multiplied its quarterly changes by the stock of one period earlier; the ensuing values seem broadly in line with the previous method, even if a higher volatility in the quarterly frequency causes an imperfect overlapping in the annual measures of revaluation. In the case of housing, we first estimated a measure of invested saving by evaluating at market prices the number of new dwellings sold, after adjusting for their average size in square meters; then we retrieved a revaluation measure as the difference between total change in stock and the estimated saving channelled to housing. As before, we checked that results are in line with those resulting from multiplying the changes in prices with the housing stock one period earlier. Interestingly, the amount of savings we have singled out in the changes of financial and housing wealth closely proxies, as a ratio to disposable income, the true propensity to save.

Figure 2



Source: Elaborations on data from Istat and Bank of Italy.

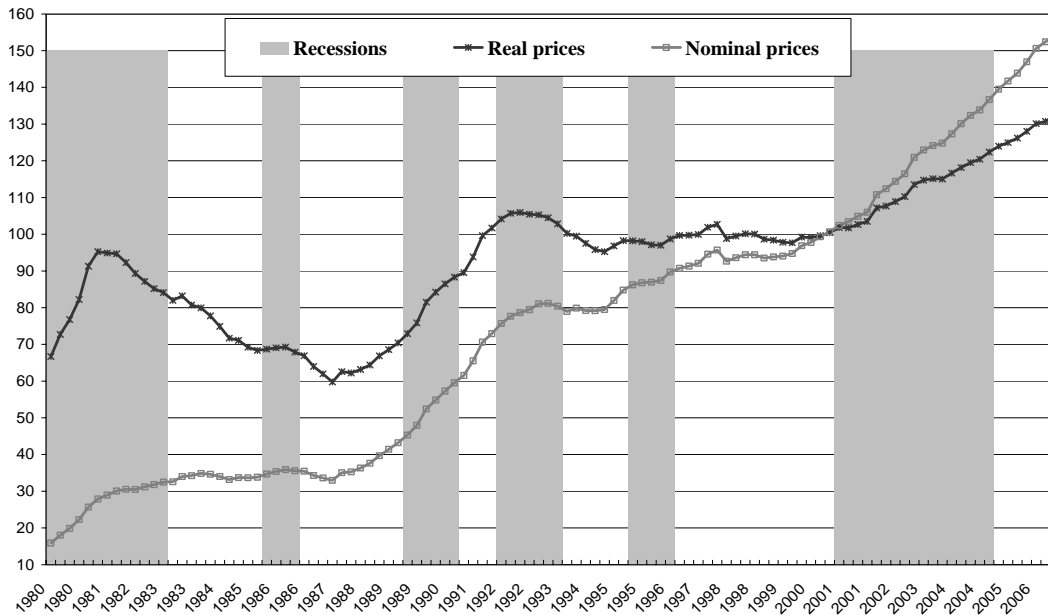
As a whole, these pieces of preliminary evidence seem to imply that the traditional arguments for a positive direct wealth effect may play a less important role in explaining the medium term drop of Italian personal saving than implied by a glance at Figure 1. Anyway the size of wealth effects needs to be tested more carefully against a long lasting period of rapid changes in the market value of assets, with particular reference to real estate.

Since the start of the current decade, the average annual growth in house prices in Italy has been around 5 percent, net of consumer price variation, or by half a percentage point higher than in the euro area as a whole, although lower than in Spain and France (around 11 and 9 percent, respectively). Differently from previous business cycles, in recent years the performance in house prices has not been affected by the state of general

economy, with revaluation keeping increasing in momentum while domestic activity virtually stagnated (Figure 3). Following the peak of a 10 per cent increase reached in 2002, house prices have gradually slowed down, more recently reflecting higher mortgage interest rates.

Figure 3

### House prices and business cycles (index 2000=100)



Sources: Elaborations on data from Istat, Il Consulente Immobiliare and the Bank of Italy.

The upward trend in prices has entailed a strong increase in the value of the real estate wealth of Italian households, which at the end of 2006 accounted for almost 60 per cent of total wealth, or 20 percentage points more than financial assets (in 2000 the gap was below 4 points, with housing's share at around 51 per cent of total wealth). The home ownership rate now stands at 72 per cent among Italian households, or some 10 points higher than the estimated value for the euro area as a whole; among the main industrial countries, the Italian lead is below 5 points with respect to UK and USA, around 15 and 30 points with respect to France and Germany, respectively.

### 3. The theory of wealth effects

According to the life cycle model, households smooth over time their consumption spending on the basis of intertemporal budget constraint, given by the sum of the discounted flow of future expected income and the current endowment in wealth. Smoothing is achieved by borrowing when young against higher expected future income, then repaying the debt when income actually raises and consuming out of accumulated wealth when retired. It turns out that consumption expenditure depends on permanent income and initial wealth, besides life expectancy and time preference. In this framework, an unexpected and permanent increase in wealth entails a roughly equal rise in consumption in every future period that households expect to live. According to the theory, therefore, the marginal propensity to consume out of wealth is significantly positive and increases with age.

Since the standard model is mostly aimed at explaining long run changes in consumption, an additional prediction that has exerted a long lasting impact on macro-modelling is that wealth composition does not matter: households instantaneously adjust their spending by the same amount against either financial or real additional wealth. This is partly related to the key theoretical assumption that capital markets are complete, which rules out liquidity constraints as well as transaction and borrowing costs due to imperfect information. As a consequence most ingredients of the current debate regarding housing prices, housing finance and consumer spending are simply missed in the standard model. Nonetheless, in recent times the challenge of facing the effects of brisk asset price changes on economic and financial stability makes it increasingly important, for monetary policy purposes, to understand how a rise in the different forms of wealth transmits to household consumption.

For this purpose, following Deaton and Muellbauer (1980) and Poterba (1984) we rearrange the intertemporal budget constraint to take account of two different wealth components: housing and financial assets. This allows one to take into account that while financial assets are mainly a liquid store of value whose holding implies negligible costs, dwellings may be considered both a consumption good, specifically providing housing services, and an investment good that requires maintenance costs to keep the structure from depreciating.<sup>3</sup> The budget constraint becomes:

$$C + p(R + \delta)WH = Y^p + R(WFI_0 + pWH_0)$$

where  $C$  is non-housing consumption,  $p$  is the relative price of housing compared to a non-housing basket of goods,  $R$  is the real interest rate and  $\delta$  is the depreciation rate,  $Y^p$  is a measure of permanent real income,  $WFI_0$  and  $WH_0$  are the initial endowments of financial and housing wealth. Thus  $p(R+\delta)WH$  is the cost of housing services, with  $p(R+\delta)$  being the real user cost.<sup>4</sup> The effect of a permanent increase in relative house prices on non-housing consumption is given by:

$$\frac{\partial C}{\partial p} = RWH_0 - (R + \delta)WH + (R + \delta)\varepsilon WH = RWH_0 - WH(R + \delta)(1 + \varepsilon)$$

where  $\varepsilon$  is the elasticity of housing demand to its own price. Three transmission channels are at work:

- a positive direct wealth effect, since housing endowment is now worth more:  $RWH_0$ ;<sup>5</sup>
- a negative income effect, due to higher costs of housing services:  $(R+\delta)WH$ ;
- a positive substitution effect, depending on the own price elasticity of housing:

$$(R+\delta)\varepsilon WH.$$

Extending consumer expenditure to include imputed consumption of housing services, namely  $CH = (R+\delta)WH$ , the effect on total consumption  $CT = C + CH$  is given by:

$$\frac{\partial CT}{\partial p} = RWH_0 - (R + \delta)WH$$

with the substitution effect now collapsed compared with the previous result.

<sup>3</sup> These add to insurance costs and fiscal burden, such as property taxes.

<sup>4</sup> This holds under the simplifying assumption of a constant  $p$  expected for the future.

<sup>5</sup> This effect is much the same as for financial assets.



It turns out that the size and sign of the residential wealth effect depend mostly on the following two factors:

i) the accurate measurement of the cost of housing services. If consumption of housing services is imputed on the basis of the real cost  $(R+\delta)$ , the housing wealth effect is likely to be negative on total consumption ( $CT$ ), turning positive on non-housing consumption ( $C$ ) since  $\varepsilon$  is plausibly lower but close to unity. If the real interest is instead omitted, the sign on total consumption would depend on  $(R-\delta)$ , while confirming positive on non-housing consumption. In any case, however, this standard model predicts that housing wealth effects, proxied at largest by  $R-\delta(1+\varepsilon)$ , would be lower than financial ones, proxied by  $R$ .

ii) the rate of home ownership, as proxied by the distance between  $WH$  and  $WH_0$ . In fact, while a positive shock to financial wealth has substantially a null effect on consumption of a non-holder (apart from a possible impact on confidence climate and expected future income), a permanent increase in relative house prices may affect both renters' and owners' optimal choice. Both would suffer from a negative income effect, but for owners this would be somewhat offset by a positive wealth effect. At the aggregate level, the balance between the two conflicting impacts is thus expected to turn positive to the extent that the rate of home ownership increases over time.

A third factor, though not modelled in the framework above, refers to differences in the processes that generate prices of financial and housing assets. Indeed, available international evidence points to much less volatility in the latter, with signs of stronger serial correlation (Leamer, 2007; OECD, 2005). This implies that, given an observed common shock in both asset prices, households may assign a greater importance to the higher permanent component for housing than for financial net worth. The argument would dampen the gap between the effects on consumption from the two different components, otherwise expected in a life cycle approach.

Finally, there is another important feature by which wealth effects may differ, namely that dwelling purchases are usually highly leveraged and imply transaction costs, related to the indivisibility and uncertainty regarding the true asset value which are much higher than for investments in financial stocks. As testified by the current debate about the housing finance revolution, this raises important implications for consumer spending that are missed by the standard theory, due to its simplifying assumption of complete capital markets. When information asymmetries are considered, the size of housing wealth effects proves to be increasing with the rate of innovation in mortgages and, more generally, with financial liberalization. As it is stressed in Mishkin (2007) and Muellbauer (2007), in the long run the main reason is that well developed financial markets make housing wealth very liquid, with two important implications: i) reducing the negative income effects on potential first buyers, especially when young, as far as the requirement for down-payment is relaxed and the savings to be channelled in a housing deposit shrink; ii) increasing wealth effects of owners, as far as they are available to downsize their dwellings, especially when old, without incurring high transaction costs. An additional effect, the equity withdrawal from housing or the supply of higher loans to households due to an increased value in collateral, is likely to play a minor role in the long run, when consumption remains anchored to the fundamental of total resources the households command, net of fiscal and financial costs. Anyway equity withdrawal might play an important role in the short run, since it increases the ability of households, otherwise credit constrained under asymmetric information, to smooth consumption over time.

In summary, the predictions of the standard life cycle model extended to include the main features by which housing and financial wealth may differ implies that the first may exert a lower effect on long run consumption under complete capital markets; the effect would become larger as the rate of home ownership increases and, under a more realistic world of asymmetric information, as financial liberalization deepens. This helps to explain why housing wealth effects may differ across countries and why they outperform financial assets where the housing finance revolution has proceeded most.

These predictions have recently been subject to increasing criticism as to the significance of the wealth effect itself when the adjustment of stocks is made endogenous too, or when we move from a partial to a general equilibrium analysis (Lettau and Ludvigson, 2004). At the same time, wealth might only exert an indirect effect, for example when a strong stock market performance proves to be a leading indicator of better general economic perspectives, which drive up both asset prices and households' expenditure.<sup>6</sup> These arguments enrich the reasons for ambiguities in the theoretical analysis of wealth effects, which are passed to the validation of empirical tests.

#### 4. Empirical evidence: an overview for Italy

We might think that on balance theoretical literature suggests that the wealth effect plays some role in affecting consumption but it is not precise enough to point to either the size of the overall effect or the relative impact of housing versus financial wealth. Many efforts have thus been made on the empirical side within a large variety of countries, starting from the first macro-estimate for the US economy during the sixties. At the applied level results do not deliver a sound solution either, as evidence proves dependent on the estimation strategy, such as variable choice and measurement, the time period covered, the statistical model, the kind of data, the within or cross country approach.

Among the main controversies, recent debate has been increasingly focusing on the role of different components of wealth, since the wave of innovation in housing finance seems to have made the link between sky-rocketing house prices and consumer spending more uncertain and country-specific. Overall, it seems that housing wealth plays quite a strong role in the US, with the marginal propensity to consume (MPC) ranging between 5 and 10 cents out of a one dollar increase in dwellings against 3 to 6 cents for financial stock (Case, Quigley and Shiller, 2005, Carroll, Otsuka and Slacalek, 2006; CBO, 2007). For the rest of industrial countries evidence is more mixed, with available evidence for continental Europe broadly pointing to a more active role for financial assets than housing wealth in the long run (Ludwig and Sløk, 2002; Altissimo *et al.*, 2005).

When focusing on the Italian economy, there is not a long empirical tradition regarding the consumption effect of financial versus housing wealth. In a cointegration analysis covering the long sample between 1951 and 1992 and controlling for pension wealth, Rossi and Visco (1995) finds the MPC out of financial and real wealth as a whole at around 3 cents in the long run. Updated evidence, based on years up to 1998, shows that the same propensity has increased to around 5 cents in the long run, against a lower MPC for pension wealth (at around 2 cents) as important social security reforms in 1992 and 1995 added uncertainty about future benefits (Zollino, 2001).

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<sup>6</sup> Further criticism points to non-linearities in the utility function and different mental accounts that may limit the willingness to spend out of saving accumulated for specific reasons, such as long term retirement or bequest motives. For a survey of main recent contributions on these issues, see Ludwig and Sløk (2002) and Belsky and Prakken (2004).

In a set of recent contributions, which confirm a size of total (non-pension) wealth effect of between 3 and 5 cents in the long run despite a shorter time period, financial assets prove to exert a stronger role than housing wealth on long run consumption. An exception is provided in Catte, Girouard and Price (2004), where evidence covering the period 1975-2002 points to MPC as small as 1 cent out of one euro increase in either financial or housing wealth. More generally the coefficient of the latter proves surprisingly negative, showing occasionally no statistical significance (Kennedy and Andersen, 1994). In a cointegration analysis covering the period 1980-1996, Girouard and Blöndal (2001) found a negative MPC out of housing at around 3 cents in the long run, compared with the positive propensity of 5 cents estimated for financial assets.<sup>7</sup> By adopting the new methodology proposed by Carroll, Otsuka and Slacalek (2006) which is mainly based on estimated sluggishness in aggregate consumption, Slacalek (2006) finds evidence for Italy of a particularly strong MPC out of financial assets, at around 10 cents or the second highest value among the main industrial countries; on the contrary, the propensity for housing proves the lowest, resulting negative at 1 cent.

At household level, based on repeated cross-sections retrieved from the Bank of Italy's biannual Survey on Household Income and Wealth (SHIW) over the period 1991-2002, Guiso, Paiella and Visco (2005) estimate a marginal propensity to consume out of housing wealth of about 1.6 cents, which is barely one half of what they found for financial assets. By splitting the sample, they find that homeowner propensity to consume out of housing wealth is close to 3.5 cents, in line with evidence for US and UK, with signs of a negative effect on renters' consumption. By adopting almost the same data set, in the full sample Paiella (2004) finds a somewhat lower MPC out of the housing wealth effect and a much higher one for the financial wealth; in the latter case, however, the coefficient risks to be biased upward due to under-reporting on the part of the wealthiest. Grant and Peltonen (2005), based on the panel section in the SHIW over the period 1989-2002, found that the housing wealth effect on consumption is not statistically significant, with a MPC size far lower in comparison with the value of 5-6 cents estimated for financial wealth.

## 5. The theoretical set up

We restate the intertemporal budget constraint of a representative consumer according to the formulation given by Campbell and Mankiw (1989):

$$W_{t+1} = (1 + R_{W,t+1})(W_t - CT_t) \quad (1)$$

where  $CT_t$  is total consumption and  $W_t$  is total wealth, made of the human ( $HU_t$ ) and non-human ( $A_t$ ) components;  $R_{W,t}$  is the net return on aggregate wealth.<sup>8</sup> Solving forward, log-linearizing and defining  $r \equiv \log(1+R)$  yields:<sup>9</sup>

$$ct_t - w_t = \sum_{j=1}^{\infty} \rho_w^j (r_{w,t+j} - \Delta ct_{t+j}) \quad (2)$$

<sup>7</sup> By adopting the same data set, time period and methodology but a different deterministic control (in order to take account of main financial innovation events), Boone, Girouard and Wanner (2001) find a similarly negative propensity for housing, but a bit higher positive propensity for financial assets, at around 6 cents in the long run.

<sup>8</sup> Labour income does not appear explicitly because tradable human capital is included in aggregate wealth.

<sup>9</sup> In the equations of this section we will always neglect the constant component of a linearization process.

which is a log-linear version of the infinite horizon budget constraint.<sup>10</sup> Extending the approach of Lettau and Ludvigson (2004), we then disaggregate non-human wealth into two different components, housing ( $WH_t$ ) and non-housing ( $WNH_t$ ) wealth, yielding:<sup>11</sup>

$$W_t = HU_t + A_t = HU_t + WNH_t + WH_t \quad (3)$$

with non housing wealth given by the sum of financial ( $WFI_t$ ) and valuables ( $WVA_t$ ) net worth. Simple algebraic manipulation lead us to:

$$w_t \cong \gamma_{hu} hu_t + \gamma_{wnh} wnh_t + (1 - \gamma_{hu} - \gamma_{wnh}) wh_t \quad (4)$$

where  $\gamma_i$  is the steady state share of asset  $i$  in total wealth. Substituting in (2) gives:

$$ct_t - \gamma_{hu} hu_t - \gamma_{wnh} wnh_t - (1 - \gamma_{hu} - \gamma_{wnh}) wh_t = \sum_{j=1}^{\infty} \rho_w^j (r_{w,t+j} - \Delta ct_{t+j}) \quad (5)$$

The non observability of human capital  $hu_t$  prevents the empirical application of this equation. Once again, we follow Lettau and Ludvigson (2001) to face the issue and assume that income  $Y_t$  is the annuity value of human wealth:  $Y_t = R_{h,t+1} HU_t$ . Some additional manipulation leads to:

$$hu_t = y_t + z_t \quad (6)$$

where  $z_t$  is a mean zero stationary random variable. Substituting and taking expectations of both sides yields:

$$ct_t - \omega_{hu} y_t - \omega_{wnh} wnh_t - (1 - \omega_{wnh} - \omega_{wh}) wh_t = E_t \sum_{j=1}^{\infty} \rho_w^j (\varpi_{t+j} - \Delta ct_{t+j}) + \omega_{hu} z_t \quad (7)$$

where

$$\varpi_{t+j} = \omega_{hu} r_{uh,t+j} + \omega_{wnh} r_{wnh,t+j} + (1 - \omega_{hu} - \omega_{wnh}) r_{wh,t+j}$$

All the variables on the left hand side of equation (7) are now observable. Moreover, if we assume that those on the right hand side are stationary, then consumption, income, housing and non-housing wealth should be tied together by some cointegrating relation, upon which we next concentrate in the empirics of the second part of the paper.

## 6. Data and preliminary analysis

In this section we briefly describe the data set and the definition of variables, then we summarize the results of a preliminary analysis and the kind of deterministic control we consider in the VECM estimation.

### 6.1 The data set

The empirical analysis focuses on the time range 1980q1-2006q4 exploiting several data sources.

*Total households' consumption* ( $CT_t$ ) is readily available from quarterly national accounts and includes spending on non durables, durables and services.

<sup>10</sup>  $\rho_w \equiv 1 - \exp(-ct-w)$ ; where  $ct$  and  $w$  are at their steady state value.

<sup>11</sup> Lettau and Ludvigson's main focus is just on human and non-human wealth.

*Households' gross disposable income* is published within national statistics only at annual frequency; in this paper we resort to a quarterly disaggregation of this series ( $Y_t$ ) which is regularly estimated by the Bank of Italy.

*Households' wealth* is taken from a new database provided by the Bank of Italy whose aggregate series are employed for the first time in this paper.<sup>12</sup> The new *housing wealth* series ( $WH_t$ ) are at annual frequency and span from 1990 onwards. Consistently with the methodology that led to their estimation,<sup>13</sup> we extend the data backwards exploiting, for the decade 1980-1989, the dynamics of time series on new dwellings<sup>14</sup> and on house prices. Once yearly data span the whole sample, quarterly disaggregation is achieved through the dynamics of residential investment published in national accounts. Wealth effects will be estimated also for a measure of housing assets net of mortgages ( $WH\_A_t$ ).

Official data for net *financial wealth* ( $WFI_t$ ) are supplied within financial accounts from 1995 onwards; backward estimation is obtained resorting to older versions of the same data, although conformed to previous accounting standards. When  $WH\_A_t$  is used; the value of financial assets is corrected accordingly (i.e. gross of mortgage debt;  $WFI\_A_t$ ).

The stock of valuables ( $WVA_t$ ) is evaluated on the basis of information gathered within the Survey of Household Income and Wealth (SHIW) run by the Bank of Italy;<sup>15</sup> annual data are disaggregated at quarterly frequency through linear interpolation.

Finally, interest rates ( $R_t$ ) are given by the returns on Treasury bonds with maturity longer than one year and deflated according to expected inflation, and public consumption ( $CC_t$ ) is directly available from quarterly national accounts.

## 6.2 Preliminary analysis

As reported at the end of section 4, equation (7) suggests the possible existence of a cointegrating relation among consumption, income, housing and non housing wealth. According to a variety of tests, we find evidence in favour of a single unit root in the data generating processes of each of these variables (see Appendix I). We also applied the same tests to the proxy of the expected flow of real interest, namely  $R_t$ , and the hypothesis of a unit root cannot be rejected.<sup>16</sup> We have done so also for real public consumption ( $CC_t$ ), with similar findings. The latter results allow us to explore the possibility of testing if  $R_t$  and/or  $CC_t$  may play as common exogenous drivers for the long-run equilibrium.<sup>17</sup>

Before estimating a VECM and testing the existence of cointegration, it is important to consider the consequences of two major economic events that happened within the sample period. In 1992-93 the Italian economy witnessed a severe currency

<sup>12</sup> The dataset is the outcome of a research project run in the last two years and provides a remedy for the relevant gap in the national statistical information set.

<sup>13</sup> For details, see Cannari and Faiella (2007).

<sup>14</sup> Data on new dwellings are provided by Cresme which is a research institute focused on the Italian construction industry; house prices for the eighties are estimated based on new dwellings in provincial capitals (see Muzzicato, Sabbatini and Zollino, 2002).

<sup>15</sup> For details, see Cannari, D'Alessio and Marchese in this volume.

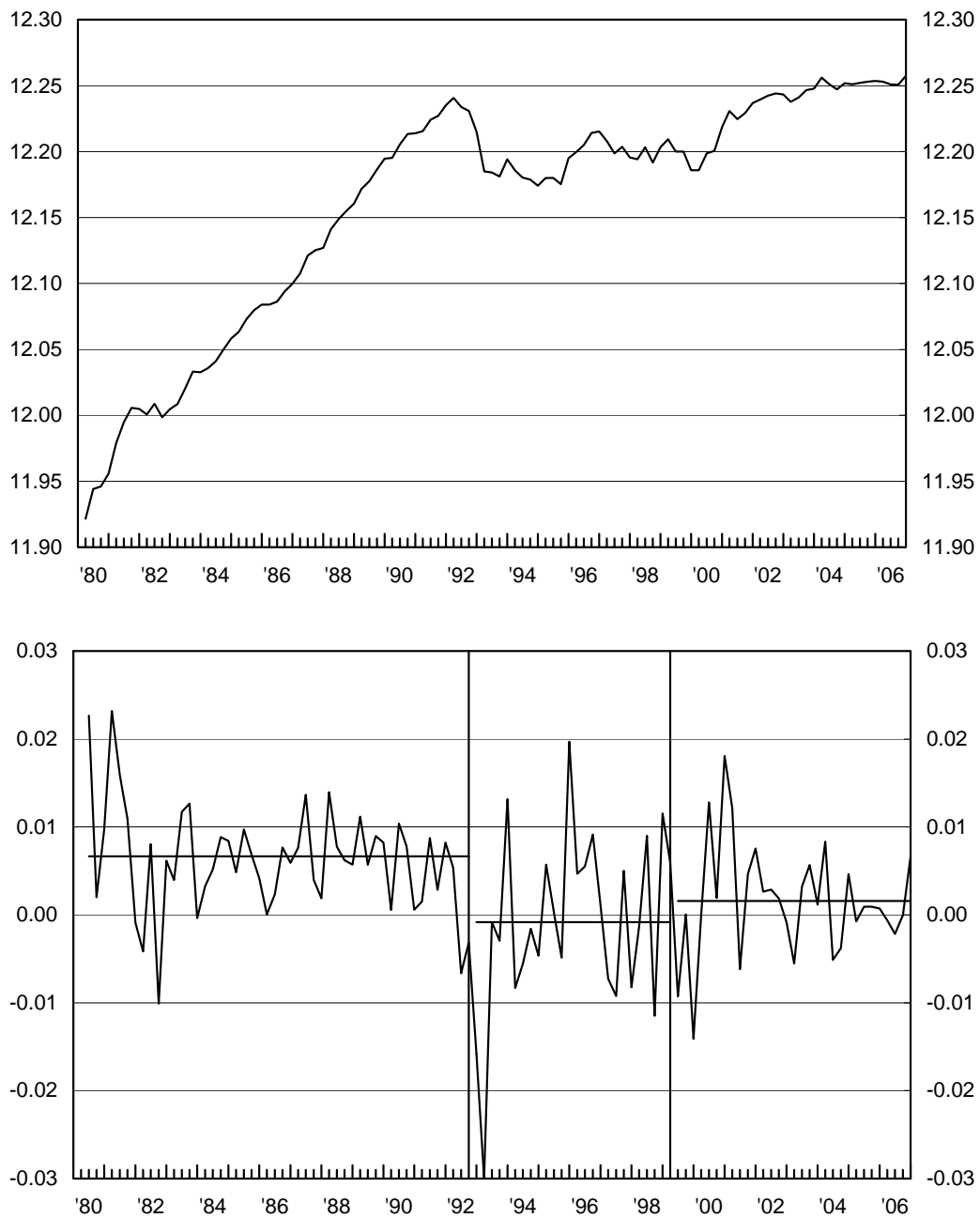
<sup>16</sup> Note that the nominal interest rate  $R_t$  has been turned into real terms through a measure of inflation expectations. Results do not change if deflation is achieved by adopting the households' consumption deflator. As discussed in the text, our aim is not to test the stationarity of variables on the right hand side of equation (7), namely the weighted average return on different kind of wealth, whose calculation is much more cumbersome.

<sup>17</sup> We also tested the effects of other forcing variables, such as public consumption and changes in the unemployment rate, with the cointegration analysis remaining broadly unchanged, though with a worse diagnostic check.

crisis and a deep recession, with GDP falling for six quarters in a row. Following a 4.3 percent drop in 1993 as a whole, households' real disposable income took some six years to recover to the same level as before the recession. The slump was less dramatic for consumer spending, that recovered more rapidly from the annual 3.1 percent fall of 1993. Inspecting the graph helps one appreciate the level shift in the income and consumption series; wealth shows minor changes (Figures 4-7).

Figure 4

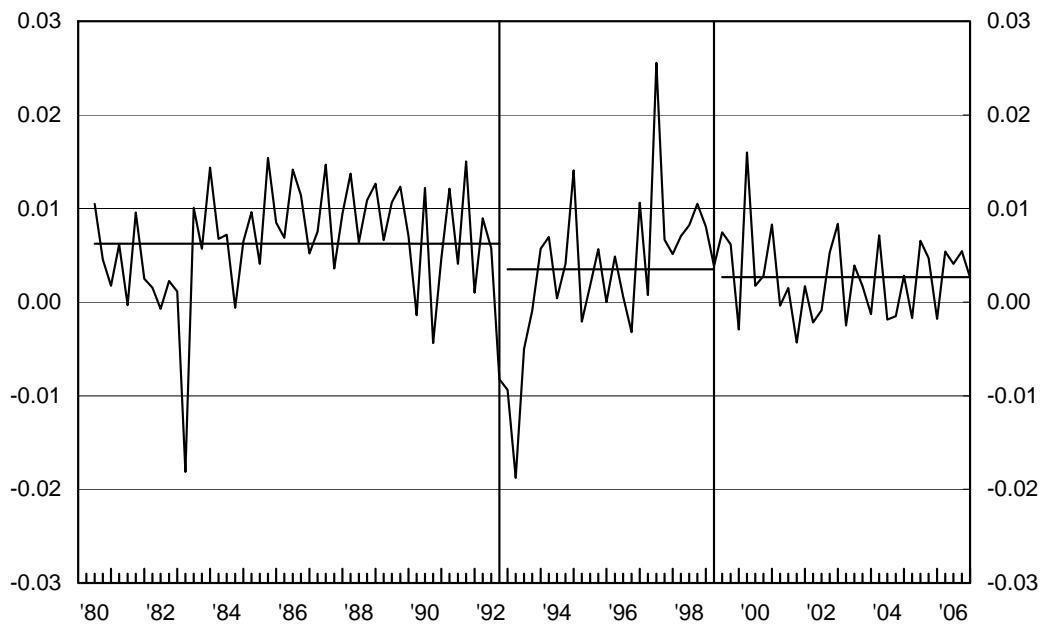
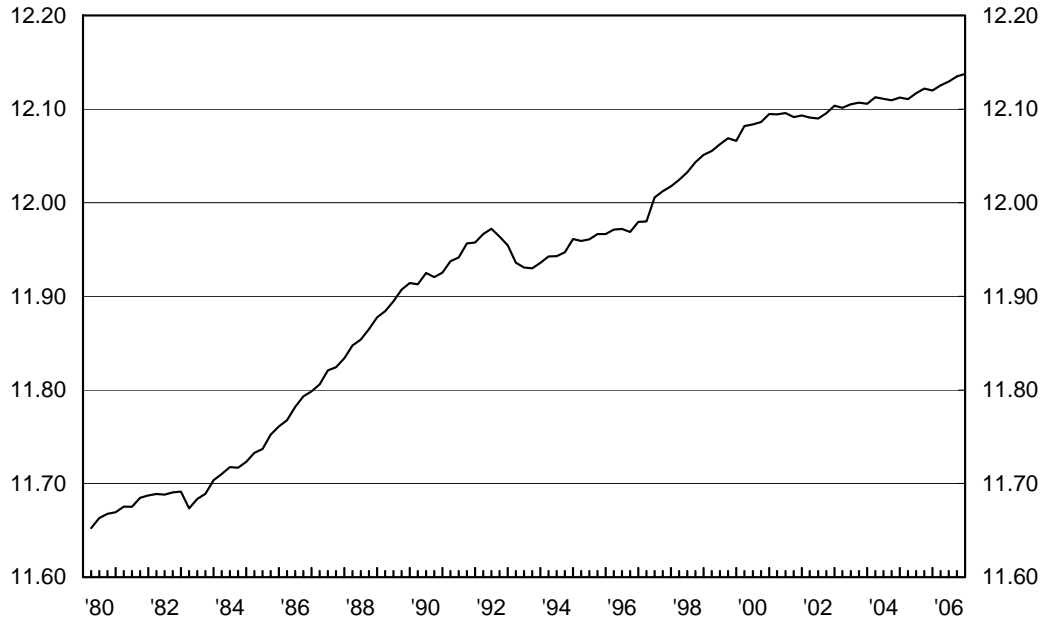
**Households' gross disposable income**  
(levels and rates of growth of chain-linked values; in logarithms)



Sources: Elaborations based on data from Istat and the Bank of Italy.

Figure 5

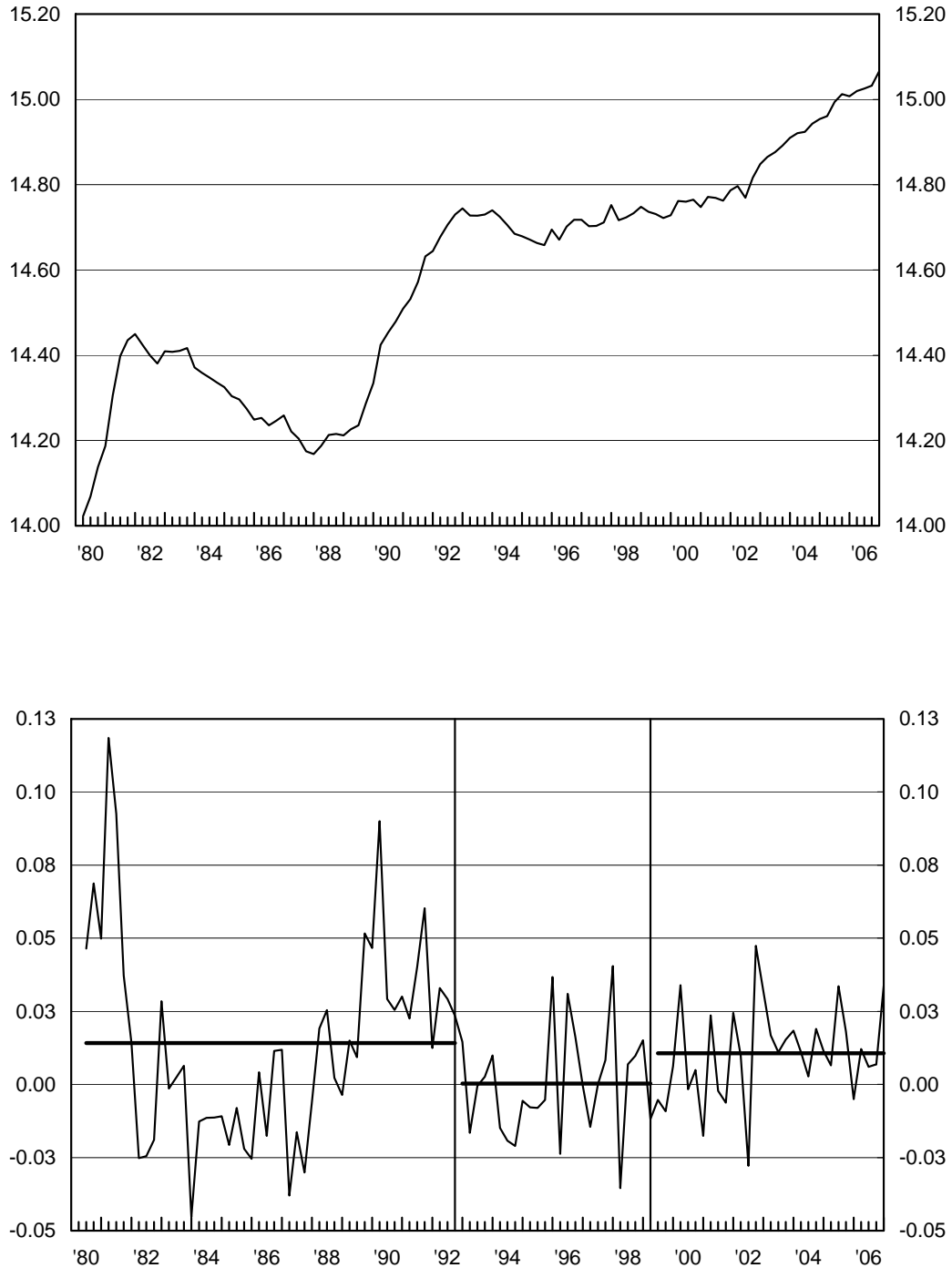
**Households' total consumption**  
(levels and rates of growth of chain-linked values; in logarithms)



Sources: Elaborations based on data from Istat and the Bank of Italy.

Figure 6

**Households' housing wealth**  
(levels and rates of growth of chain-linked values; in logarithms)

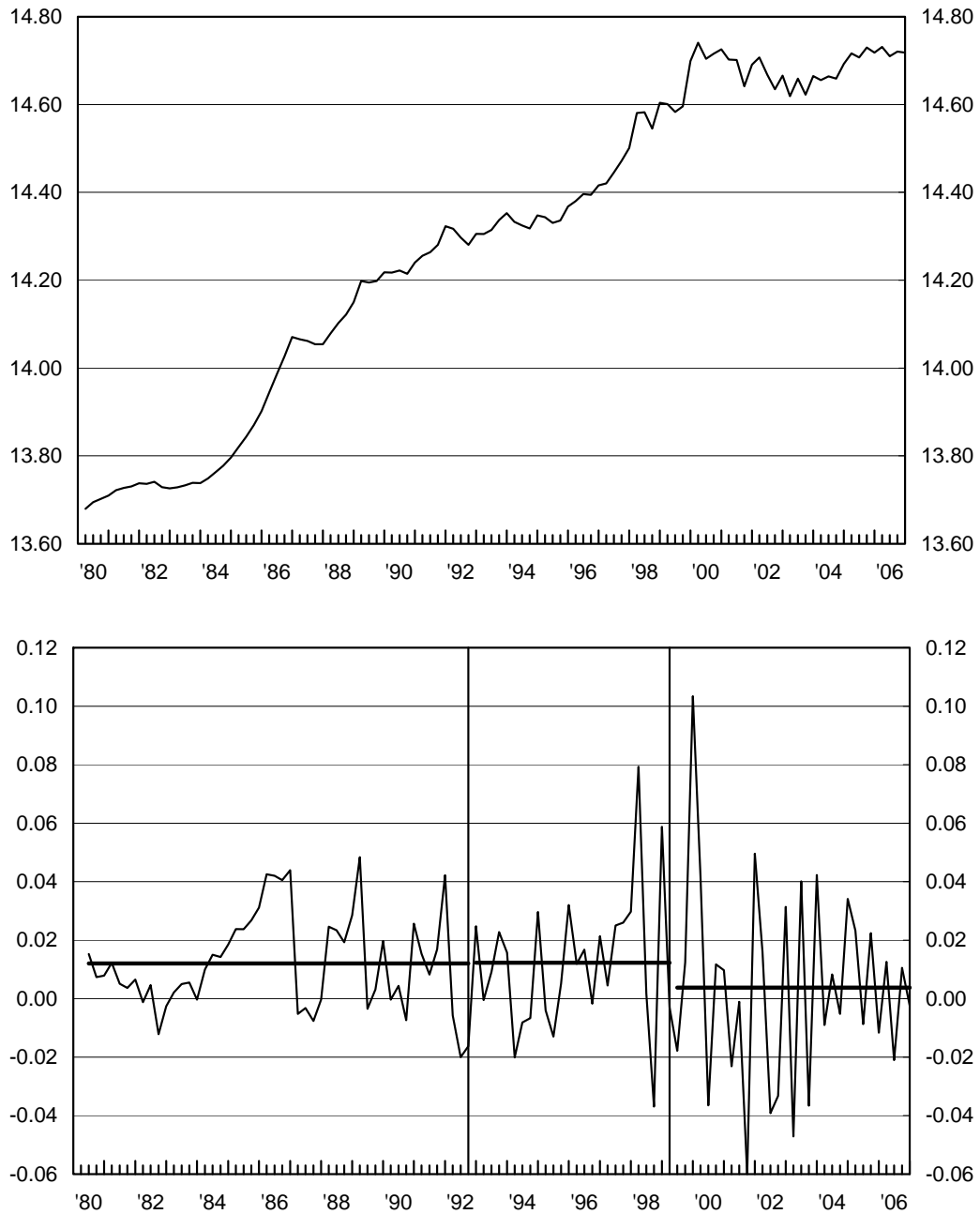


Sources: Elaborations based on data from Istat and the Bank of Italy.



Figure 7

**Households' non-housing wealth**  
*(levels and rates of growth of chain-linked values; in logarithms)*



Sources: Elaborations based on data from Istat and the Bank of Italy.

The deep nature of these effects put under pressures the productive and institutional setting of our economy as a whole, calling for urgent and permanent revisions in key fields of economic policies; they were actually implemented as for restrictions in social security provisions and public employment, plausibly curbing permanent income on the side of Italian households (Miniaci and Weber, 1999).

The second event happened some years later when, after the huge fiscal effort made in 1997 and 1998 to meet the financial standards set by the European Monetary Union, the Italian economy joined the single currency area. The institutional changes that followed, including new exchange rates and monetary policy regimes, plausibly represent another permanent innovation in the data generating processes. On one side, Italian export performance came under the new pressure of irreversible parity, stressing the need for a more efficient production plans, on the other side the mortgage interest rate almost halved between 1997 and 1999, thus easing the access to the credit market for consumers.

Permanent economic shocks do not disappear in cumulation and, therefore, have effects on stochastic trends. Moreover, they may have varied impacts on the variables of the system and thus their effects may not cancel out in the cointegrating relation. All this suggests the introduction of two dummy variables in 1992q3 and 1999q1, restricted to lying in the cointegrating relationship to control for the possibility of level shift in the long-run equilibrium; their statistical significance will be tested in the next section.<sup>18</sup> Alternatively, we have tested the effects of two forcing variables, namely public consumption and real interest rate, which we think better summarize the economic changes driving level shifts in cointegrating relation.

## 7. Econometric results

We estimate the VECM  $\Delta X_t = \mu + \alpha\beta'X_{t-1} + \sum_k \Gamma_k \Delta X_{t-k} + \varepsilon_t$  for the vector  $X_t = (ct_t, y_t, wh_t, wnh_t, r_t)'$ , where variables are in real terms and lower case letters indicate logs;<sup>19</sup> non housing wealth is  $WNH_t = WFI_t + WVA_t$ . In the first instance, we do not introduce any deterministic control in the VAR, whose length has been set equal to three.<sup>20</sup>

### 7.1 Rank of cointegration

Results for the rank test are reported in Table 1; standard critical values appear alongside those to be considered when including the Bartlett correction in the statistics, in order to take into account the relatively small dimension of our sample. The hypothesis of one cointegrating relation ( $r=1$ ) and four common trends ( $n-r=4$ ) is accepted; the diagnostics of the system do not reveal major specification problems, apart from some violation of the normality assumption that will be easily fixed with the introduction of the unrestricted dummies mentioned previously.

The choice  $r=1$  is robust across different VAR length specifications and independent from the presence of outlier controls; the same rank is assigned also when the system is reduced to contain a single measure of total wealth ( $wtot_t$ ), instead of the two distinct forms  $wh_t$  and  $wnh_t$ . Some evidence in favour of  $r=2$  arises when we introduce the two deterministic controls for the candidate level shifts, mainly depending

<sup>18</sup> Additionally, three unrestricted (i.e. outside of the cointegrating relation) dummy variables have been introduced to control for data outliers and to improve the diagnostic checks (for example, such an intervention dummy was used in 1997q2, when spending was boosted by fiscal incentives for old car replacement).

<sup>19</sup> Disposable income, housing and non housing wealth have been deflated with the deflator of consumption, while inflation expectations were used for real interest rate, as already outlined in section 6.1. Results remain substantially unchanged when the deflator of consumption is also applied to the interest rate.

<sup>20</sup> Information criteria pointed to a slightly more parsimonious specification, but we preferred to maintain a richer dynamic structure. The main results presented in the following of the section do not depend on the order of the VAR. Details of the lag length determination procedure are available on request.

on the precise timing at which we date the effect of the 1992 recession.<sup>21</sup> Nonetheless, considering the overall outcomes and the economic *a priori* based on our theoretical set-up, we set the rank  $r=1$ .<sup>22</sup>

Table 1

## Cointegration trace test (\*)

Common trends $n-r$	Rank $r$	Trace test	Trace test**	Standard critical values	
				$p$ -value	$p$ -value*
5	0	84.208	70.808	0.002	0.040
4	1	44.406	37.441	0.101	0.331
3	2	21.485	17.033	0.338	0.646
2	3	8.600	6.849	0.411	0.601
1	4	2.183	1.800	0.140	0.180

(\*) Critical values refer to a model with an unrestricted constant term.

(\*\*) Bartlett corrected statistics.

## 7.2 Results

In the upper panel of Table 2 we report the estimates of the cointegrating vector  $\beta$  for the different model specifications obtained under the control for deterministic shifts in *1992q3* and *1998q1*, that invariantly resulted to be statistically significant, also when we control for the effects of real interest rate. As it results from a comparison with the table reported in Appendix II, the omission of the deterministic controls would mainly imply an implausibly lower coefficient for income, leaving the coefficients of the remaining variables broadly unchanged as well as their robustness and signs. This points to the opportunity to take into account the shocks that likely hit the variables of the system heterogeneously, as was the case particularly with the 1992 crisis, when the income drop was very pronounced and long lasting. Interestingly, as we comment later on, the statistical significance of deterministic controls vanishes at all only when we extend the forcing variables to include real public consumption.

Overall, estimates look statistically significant and economically plausible both in terms of sign and magnitude; further they are quite robust across different VAR specifications. Forward and backward recursive tests do not reject the hypothesis of constancy over the time range under analysis (Appendix III).

While the cointegrating relationship summarizes the *correlation* between the permanent movements in consumption, income and wealth over the sample period, the empirical literature often interprets the estimated parameters in terms of elasticities or MPC. As in Lettau and Ludvigson (2004), this is a reasonable practice as they come out from a regression of consumption on wealth, controlling for income and real interest rates. The estimated parameters are also super-consistent and thus robust to regressors endogeneity.

<sup>21</sup> Results are available on request. Simulated critical values have been considered with standard ones, in order to take into account the dependency of asymptotic distribution on deterministic components, in particular on structural breaks. The CATS software, which was used for estimations, includes procedures both for simulating critical values for non standard models and for applying the Bartlett small sample correction.

<sup>22</sup> The choice seems corroborated by inspecting the graph of the second possible cointegrating relation, which exhibits signs of persistency and thus suggests that the equilibrium error might be non-stationary. Further, the recursively calculated trace test for  $r=2$  lies under the 5 percent critical value for most of the sample.

Table 2

**Cointegration coefficients** (\*)  
(normalized on the coefficient of total consumption  $ct$ )

	Model specification					
	(A)	(B)	(C)	(D)	(E)	(F)
	Cointegrating coefficients ( $\beta$ -vectors)					
Total wealth ( $wtot_t$ ).....	-0.167 (-3.697)	-0.178 (-3.494)				
Housing wealth ( $wh_t$ ).....			-0.076 (-3.896)	-0.074 (-4.056)		
Non housing wealth ( $wnh_t$ ).....			-0.109 (-2.680)	-0.118 (-2.937)		
Housing wealth net of mortgages ( $wh\_a_t$ ).....					-0.076 (-3.723)	-0.047 (-3.879)
Non housing wealth gross of mortgages ( $wnh\_a_t$ )..					-0.093 (-2.004)	-0.191 (-8.463)
Disposable income ( $y_t$ ).....	-0.941 (-12.049)	-1.100 (-9.092)	-0.845 (-8.067)	-0.871 (-8.046)	-0.959 (-7.929)	-0.755 (-9.008)
Interest rate ( $r_t$ ).....		-0.037 (-2.302)		-0.009 (-0.901)	-0.014 (-1.211)	0.045 (6.162)
Public consumption ( $cc_t$ ).....						0.191 (4.181)
Deterministic controls in the cointegrating vector						
1992q3	-0.047 (-3.473)	-0.071 (-4.044)	-0.038 (-3.079)	-0.042 (-3.336)	-0.051 (-3.689)	
1998q1	-0.048 (-4.479)	-0.076 (-3.829)	-0.044 (-3.803)	-0.050 (-3.654)	-0.058 (-3.781)	
	Error correction loadings ( $\alpha$ )					
Total consumption ( $ct_t$ ).....	0.033 (1.190)	0.054 (2.283)	0.028 (0.840)	0.020 (0.567)	0.030 (0.968)	-0.160 (-2.427)
Total wealth ( $wtot_t$ ).....	0.380 (4.009)	0.265 (3.343)				
Housing wealth ( $wh_t$ ).....			0.641 (4.355)	0.570 (3.681)		
Non housing wealth ( $wnh_t$ ).....			0.176 (1.172)	0.216 (1.374)		
Housing wealth net of mortgages ( $wh\_a_t$ ).....					0.482 (3.426)	0.774 (3.064)
Non housing wealth gross of mortgages ( $wnh\_a_t$ )..					0.171 (1.288)	-0.091 (-0.339)
Disposable income ( $y_t$ ).....	0.206 (6.774)	0.178 (6.848)	0.260 (6.731)	0.285 (6.993)	0.255 (7.157)	0.308 (4.055)

(\*)  $t$ -statistics in parenthesis.

Based on our estimates of the cointegrating vector, one percentage point increase in housing ( $wh_t$ ) and non housing ( $wnh_t$ ) wealth would be associated with an increase of, respectively, 0.08 and 0.11 percentage points in total consumer spending (column C of Table 2). These elasticities remain statistically unchanged when we correct for mortgage debts in both kinds of wealth (column E). In terms of marginal propensity to consume, the outcomes state that a one euro rise in housing and non housing wealth would be associated with an increase of about, respectively, 2 and 4 cents in consumption.<sup>23</sup> If we concentrate on a single measure of total net worth ( $wtot_t$ ; column A), the elasticity of consumption amounts to 0.17 and the marginal propensity to consume to 2.6 cents for a one euro wealth increase. Finally the MPC out of disposable income is in the order of 70 cents.

It is worth noting that these results are confirmed when we test for common external drivers leading the system of variables we considered, implying evidence in favour of a direct wealth effect. In this regard, in Table 2 we report estimates obtained by controlling for changes in the long-term real interest rate. This variable proves to be weakly exogenous under the different specifications we tested, and leaves the cointegrating vector substantially unchanged and largely significant.<sup>24</sup>

Additionally, we tested for the role of real public consumption as a proxy for fiscal discipline: alike  $R_t$ ,  $CC_t$  proves weakly exogenous to our cointegrating system. Moreover, comparison of columns E and F shows that when the two variables are jointly modelled as common drivers, the case for deterministic controls drops. The result delivers an interesting economic content of the two regime switches that statistically show up in the dummies 1999q3 and 1998q1. On one side, the stringent curbing of public deficit over the nineties may have provided support to the households' spending plans in the long run much in line with a Ricardian neutrality mechanism; on the other, the fall in real long-term yields was presumably perceived by households as permanent too, and this contributed to shift their plans from saving to consumption. According to this specification, the marginal propensity to consume amounts to about 60 cents out of one euro increase in income, and about 6 and 1.5 cents out of similar changes in financial and housing wealth, respectively.<sup>25</sup>

### 7.3 Equilibrium correction

In the bottom panel of Table 2 we report the coefficients  $\alpha = (\alpha_{ct}, \alpha_y, \alpha_{wh}, \alpha_{wnh})'$  of the error correction term ( $\beta'X_{t-1}$ ) that give a measure of the reaction of each variable, at time  $t$ , to the disequilibrium of the system in period  $t-1$ . Consumption smoothness is confirmed by the fact that  $\alpha_{ct}$  is not statistically significant; it turns out that the adjustment process towards the long-run equilibrium is mainly achieved via housing wealth, while non-housing net worth does not show significant error correction movements. This comes as no surprise, given the widespread diffusion of house ownership among Italian

<sup>23</sup> Marginal propensities are obtained by dividing the elasticities by the average ratio of the corresponding variable to consumption over the full sample period.

<sup>24</sup> Weak exogeneity implies that the interest rate enters the cointegrating vector, but it does not contribute to the correction towards the long run equilibrium (namely, the loading coefficient  $\alpha_r$  is not statistically different from zero). It also turns out that the coefficient in the cointegrating vector is not significant, as shown in the table.

<sup>25</sup> If pension wealth is included in the cointegrating system, its impact on consumption is negligible in the considered period, contrary to the positive effect found over a much longer time horizon (Zollino, 2001). It appears that the repeated changes in social security rules since 1992 have made benefits and retirement dates more uncertain, reducing the responsiveness of consumption plans to pension wealth.

households, as shown by the particularly high rate of home ownership. Also disposable income contributes to smooth household spending, although to a much lesser extent.

## 8. Permanent-transitory decomposition

The cointegrating coefficients of the previous section are based on the existence of a common trend that ties together the long run movements of consumption, income and wealth. Thus, as already noted, they reveal the degree of correlation among the permanent components of the variables in the system, whereas they are completely useless for inference regarding the relationship between consumption and transitory changes in income and wealth. If a large degree of quarterly fluctuations of income and wealth was to be actually due to transitory events, then cointegrating coefficients would be poorly informative about their relation with households spending and should be cautiously interpreted. Consequently, as suggested by Lettau and Ludvigson (2004), once we have determined the long run correlation among the variables in the system, we need to assess whether there exist (transitory) movements in income and wealth unassociated to (permanent) changes in consumption.

We apply to our system  $X_t$  of I(1) variables the econometric framework proposed by Gonzalo and Ng (2001) to isolate the permanent ( $\tilde{\eta}_t^P$ ) and transitory ( $\tilde{\eta}_t^T$ ) shocks, as defined by the following two conditions:

$$\lim_{h \rightarrow \infty} \partial E_t(X_{t+h}) / \partial \tilde{\eta}_t^{P'} \neq 0 \quad \lim_{h \rightarrow \infty} \partial E_t(X_{t+h}) / \partial \tilde{\eta}_t^{T'} = 0$$

Hinging on Gonzalo and Granger (1995), it can be shown that these shocks can be readily recovered with a two step procedure exploiting the information available in the VECM.

Starting from the multivariate moving average representation  $\Delta X_t = \delta + C(L)e_t$ ,<sup>26</sup> in the first step the vector  $u_t$  of unorthogonalized permanent and transitory shocks is given by the following simple transformation of innovations (residuals)  $e_t$ :

$$u_t = \begin{bmatrix} u_t^P \\ u_t^T \end{bmatrix}_{\substack{(n-r) \times 1 \\ r \times 1}} = \begin{bmatrix} \alpha'_\perp e_t \\ \beta' e_t \end{bmatrix} = G e_t \quad \text{with} \quad G = \begin{bmatrix} \alpha'_\perp \\ \beta' \end{bmatrix}_{\substack{(n-r) \times n \\ r \times n}}$$

where  $\alpha'_\perp \alpha = 0$ .

In the second step, orthogonality of  $\tilde{\eta}_t$  is achieved exploiting the Choleski decomposition of  $\text{cov}(u)$ :<sup>27</sup>

$$E(u_t u_t') = H H^{-1} \\ \tilde{\eta}_t = H^{-1} u_t$$

<sup>26</sup>  $C(L)$  is a distributed lag operator and  $e_t$  is a  $(n \times 1)$  vector with  $E(e_t) = 0$  and  $E[e_t e_s'] = \begin{cases} 0 & \text{if } t \neq s \\ \Omega & \text{otherwise} \end{cases}$

<sup>27</sup> Gonzalo and Ng outline that the Choleski decomposition is one of the many available alternatives for choosing  $H$ , which need to be lower block triangular. As a consequence, the  $\tilde{\eta}_t$  we found are not unique. Further, the Choleski decomposition, although being quite convenient, entails that the order matters; however it can be easily shown that in this setting a variable  $X_{it}$  can react to  $\tilde{\eta}_{jt}^P$  even if  $j > i$ , thus mitigating the effects of the recursive structure of the system.

We end up, therefore, with the Wold representation:

$$\Delta X_t = \delta + C(L)e_t = \delta + C(L)G^{-1}HH^{-1}Ge_t = \delta + D(L)HH^{-1}u_t = \delta + \tilde{D}(L)\tilde{\eta}_t$$

that allows one to bring back the growth of each variable in the system to a function of the permanent and transitory shocks. Specifically, on the basis of our results, a cointegration rank equal to one implies the existence of three common stochastic trends (permanent shocks) and one transitory innovation. Gonzalo and Ng's decomposition enables the assessment of their role in the movements of consumption, disposable income, housing and non-housing wealth.

Table 3

**Forecast error variance decomposition – disaggr. wealth (\*)**  
(orthogonalized VAR residuals)

Horizon	$\Delta ct_{t+h} - E_t \Delta ct_{t+h}$		$\Delta y_{t+h} - E_t \Delta y_{t+h}$		$\Delta wh_{t+h} - E_t \Delta wh_{t+h}$		$\Delta wnh_{t+h} - E_t \Delta wnh_{t+h}$	
	Perm.	Trans.	Perm.	Trans.	Perm.	Trans.	Perm.	Trans.
Setting $\alpha_c$ and $\alpha_e$ to their estimated values								
1.....	0.988	0.012	0.275	0.725	0.696	0.304	0.978	0.022
2.....	0.983	0.017	0.359	0.641	0.778	0.222	0.985	0.015
3.....	0.983	0.017	0.388	0.612	0.855	0.145	0.989	0.011
4.....	0.987	0.013	0.451	0.549	0.896	0.104	0.992	0.008
5.....	0.990	0.010	0.518	0.482	0.921	0.079	0.993	0.007
6.....	0.993	0.007	0.594	0.406	0.936	0.064	0.995	0.005
7.....	0.994	0.006	0.666	0.334	0.947	0.053	0.995	0.005
8.....	0.995	0.005	0.727	0.273	0.954	0.046	0.996	0.004
9.....	0.996	0.004	0.777	0.223	0.960	0.040	0.996	0.004
10.....	0.996	0.004	0.816	0.184	0.964	0.036	0.997	0.003
11.....	0.997	0.003	0.846	0.154	0.967	0.033	0.997	0.003
12.....	0.997	0.003	0.869	0.131	0.970	0.030	0.997	0.003
24.....	0.999	0.001	0.958	0.044	0.984	0.016	0.999	0.001
36.....	0.999	0.001	0.975	0.025	0.989	0.011	0.999	0.001
Setting $\alpha_c = \alpha_{wnh} = 0$								
1.....	1.000	0.000	0.331	0.669	0.704	0.296	1.000	0.000
2.....	0.999	0.001	0.429	0.571	0.775	0.225	1.000	0.000
3.....	0.998	0.002	0.449	0.551	0.848	0.152	0.996	0.004
4.....	0.999	0.001	0.503	0.497	0.890	0.110	0.995	0.005
5.....	0.999	0.001	0.561	0.439	0.917	0.083	0.996	0.004
6.....	0.999	0.001	0.628	0.372	0.934	0.066	0.996	0.004
7.....	0.999	0.001	0.691	0.309	0.945	0.055	0.996	0.004
8.....	0.999	0.001	0.746	0.254	0.953	0.047	0.997	0.003
9.....	0.999	0.001	0.790	0.210	0.959	0.041	0.997	0.003
10.....	0.999	0.001	0.825	0.175	0.964	0.036	0.997	0.003
11.....	1.000	0.000	0.852	0.148	0.967	0.033	0.998	0.002
12.....	1.000	0.000	0.873	0.127	0.970	0.030	0.998	0.002
24.....	1.000	0.000	0.956	0.044	0.985	0.015	0.999	0.001
36.....	1.000	0.000	0.973	0.027	0.990	0.010	0.999	0.001

(\*) Shares might not sum to unity because of their rounding.

For brevity, in Table 3 we concentrate on a system with deterministic controls and report the share of the variance in the  $h$ -step forecast error attributable to the two kinds of shock.<sup>28</sup> In the top panel, we used the estimates discussed in the previous section; in the

<sup>28</sup> See the system in column C, Table 2.

bottom part, the statistically insignificant error correction coefficients,  $\alpha_c$  and  $\alpha_{wnh}$ , have been set to zero, as suggested by Gonzalo and Ng. In both cases the three permanent shocks dominate the variance of consumption growth; this implies, in accordance with the prediction of the life-cycle model, that households' spending responds exclusively to changes in the permanent component of wealth and income.

Actually from Table 3 it emerges that permanent shocks are responsible for almost the entire variance in non-housing net worth of Italian households at all horizons, the picture being not much different for residential wealth, apart from the very first quarters when  $\tilde{\eta}_t^T$  is not negligible. Transitory innovation effects take time to elapse for disposable income, driving three fifths of its variability on the average of the first year and one fourth after eight quarters, with overwhelming permanent shocks in the longer run.

These overall features hold substantially true also when we focus on a single measure of total wealth, for which transitory innovation effects almost fully disappear after a few quarters (Table 4).

Table 4

**Forecast error variance decomposition – total wealth** (\*)  
(orthogonalized VAR residuals)

Horizon	$\Delta c_{t+h} - E_t \Delta c_{t+h}$		$\Delta y_{t+h} - E_t \Delta y_{t+h}$		$\Delta y_{t+h} - E_t \Delta y_{t+h}$	
	Perm.	Trans.	Perm.	Trans.	Perm.	Trans.
Setting $\alpha c$ and $\alpha e$ to their estimated values						
1	0.974	0.026	0.187	0.813	0.715	0.285
2	0.973	0.027	0.195	0.805	0.792	0.208
3	0.975	0.025	0.224	0.776	0.850	0.150
4	0.978	0.022	0.277	0.723	0.883	0.117
5	0.981	0.019	0.351	0.649	0.904	0.096
6	0.984	0.016	0.441	0.559	0.918	0.082
7	0.987	0.013	0.530	0.470	0.928	0.072
8	0.988	0.012	0.608	0.392	0.936	0.064
9	0.990	0.010	0.672	0.328	0.943	0.057
10	0.991	0.009	0.724	0.276	0.948	0.052
11	0.992	0.008	0.765	0.235	0.952	0.048
12	0.993	0.007	0.797	0.203	0.956	0.044
24	0.997	0.003	0.934	0.066	0.978	0.022
36	0.998	0.002	0.963	0.037	0.985	0.015
Setting $\alpha c = 0$						
1	1.000	0.000	0.207	0.793	0.713	0.287
2	0.999	0.001	0.235	0.765	0.789	0.211
3	0.997	0.003	0.259	0.741	0.849	0.151
4	0.996	0.004	0.319	0.681	0.885	0.115
5	0.997	0.003	0.397	0.603	0.907	0.093
6	0.997	0.003	0.488	0.512	0.923	0.077
7	0.997	0.003	0.574	0.426	0.934	0.066
8	0.998	0.002	0.646	0.354	0.942	0.058
9	0.998	0.002	0.703	0.297	0.949	0.051
10	0.998	0.002	0.748	0.252	0.954	0.046
11	0.998	0.002	0.783	0.217	0.958	0.042
12	0.998	0.002	0.811	0.189	0.962	0.038
24	0.999	0.001	0.932	0.068	0.981	0.019
36	1.000	0.000	0.959	0.041	0.987	0.013

(\*) Shares might not sum to unity because of their rounding.



It turns out that the cointegrating coefficients reported in Tables 2 and 3 are very informative as to the relation between Italian households' spending and wealth, both their movements being soon dominated by the common trend they share.

Some more caution should be used when reading the coefficient of income, whose reaction to transitory innovation is not trivial. Let's consider, for instance, the average variance decomposition of the first eight quarters: since 51 percent of the movements in income are transitory, then only the remaining 49 percent will be associated with the marginal propensity to consume of 70 cents estimated in section 7.3. In the longer run, however, the overwhelming role played by permanent shocks confirms that we can consider the income MPC as actually informative.

Decomposition results are broadly in line with those already available in the international applied literature, the major difference being the bigger role played by permanent innovations in the dynamics of Italian non-housing net worth. In particular, Lettau and Ludvigson (2004) find that in the US stock market wealth – just a component of the broader financial aggregate we used for Italy – is dominated by transitory shocks, which explain half of the variance of US financial assets also in Kundan Kishor (2006).

According to Pichette and Tremblay (2003), this share declines to about 30 per cent for Canadian stock wealth. The heterogeneity of results can be brought back to the composition of Italian households' financial wealth, in which money and deposits – presumably particularly sensitive to permanent shocks – have traditionally played a relevant role in families' portfolios, while stocks have represented a minor share.

## **9. Conclusions**

Since the strong upsurge of real estate prices in the late nineties, renewed interest has emerged on the linkage between households' consumption, income and wealth. More specifically, analysts and economists frequently ask questions about the significance and magnitude of the marginal propensities to consume out of financial and, above all, housing wealth. Despite the increasing interest, the aggregate evidence on this issue was virtually nil for the Italian economy. Based on fresh estimates on households' wealth, we find sound evidence in favour of the existence of a cointegrating relation between consumer spending and different stock components, with a positive wealth effect in the long run. In the vein of Lettau and Ludvigson (2004), we enriched the research by investigating the role of transitory and permanent shocks in the variables considered. We found that consumption, housing and non housing wealth respond almost exclusively to permanent shocks; the same shocks play an overwhelming role also for disposable income over a long horizon, whereas in the short run the effects of transitory shocks are not negligible. As a result, we estimate a marginal propensity to consume out of housing and non housing wealth in the range of, respectively, 1.5-2 and 4-6 cents, which we may consider to closely match the true values in the long run equilibrium.

**APPENDIX I**  
**UNIT ROOT TEST RESULTS**

Table I-1

**Unit root test results** (\*)  
(variables in logs and in real terms)

	Total consumption ( $c_t$ )	Housing wealth ( $wh_t$ )	Non housing wealth ( $wnh_t$ )	Housing wealth net of mortgages ( $wh\_a_t$ )	Non housing wealth gross of mortgages ( $wnh\_a_t$ )	Total wealth ( $wtot_t$ )	Disposable income ( $y_t$ )	Interest rate ( $r_t$ )
Augmented Dickey-Fuller Test – $H_0$ : series has a unit root								
Variables in level .....	-1.800** (0.38)	-0.638** (0.86)	-1.344** (0.61)	0.095** (0.96)	-1.176** (0.68)	-1.489** (0.536)	-1.7818** (0.39)	-0.958** (0.77)
1 <sup>st</sup> differences.	-3.560 (0.00)	-4.13 (0.00)	-9.023 (0.00)	-0.348 (0.00)	-8.689 (0.00)	-6.410 (0.00)	-3.773 (0.000)	-5.99 (0.00)
Phillips-Perron Test – $H_0$ : series has a unit root								
Variable in levels.....	-1.456** (0.55)	-1.297** (0.63)	-1.322** (0.62)	-1.435** (0.56)	-1.149** (0.69)	-1.302** (0.63)	-3.763 (0.004)	-0.798** (0.82)
1 <sup>st</sup> differences.	-7.09 (0.00)	-5.232 (0.00)	-9.547 (0.00)	-5.310 (0.00)	-9.485 (0.00)	-6.51 (0.00)	-7.489 (0.00)	-6.05 (0.00)
ERS <sup>(1)</sup> Test – $H_0$ : series has a unit root								
Variable in levels.....	1045**	57.47**	351.7**	52.49**	407.0**	477.0**	454.2**	122.40**
1 <sup>st</sup> differences.	1.35	2.16	0.49	2.17	0.49	1.02	2.69	0.68
KPSS <sup>(2)</sup> Test – $H_0$ : series is stationary								
Variable in levels.....	1.142	1.065	1.141	1.045	1.148	1.171	0.982	1.142
1 <sup>st</sup> differences.	0.239**	0.072**	0.20**	0.07**	0.16**	0.10**	0.61	0.086**

(\*) When reported,  $p$ -values in brackets. (\*\*):  $H_0$  accepted at 95% confidence level; (1) Elliot, Rothenberg and Stock point optimal test; (2) Kwiatkowski, Phillips, Schmidt and Shin test.

## APPENDIX II

### COINTEGRATION COEFFICIENTS

Table II-1

**Cointegration coefficients in VARs without deterministic controls**<sup>(\*)</sup>  
(normalized on the coefficient of total consumption  $ct$ )

	System specification				
	(A)	(B)	(C)	(D)	(E)
	Cointegrating coefficients ( $\beta$ -vectors)				
Total wealth ( $wtot_t$ ).....	-0.360 (-11.245)	-0.227 (-5.850)			
Housing wealth ( $wh_t$ ).....			-0.092 (-5.815)	-0.064 (-5.601)	
Non Housing wealth ( $wnh_t$ ).....			-0.285 (-15.809)	-0.244 (-10.974)	
Housing wealth net of mortgages ( $wh\_a_t$ )....					-0.069 (-4.999)
Non housing wealth gross of mortgages ( $wnh\_a_t$ ).....					-0.257 (-9.193)
Interest rate ( $r_t$ ).....		0.037 (3.447)		0.019 (3.024)	0.010 (1.326)
Disposable income ( $y_t$ ).....	-0.746 (-6.993)	-0.729 (-10.036)	-0.429 (-7.855)	-0.444 (-10.930)	-0.452 (-9.223)
	Error correction loadings ( $\alpha$ )				
Total consumption ( $ct_t$ ).....	0.015 (0.620)	-0.036 (-1.058)	-0.029 (-0.612)	-0.144 (-2.284)	-0.090 (-1.562)
Total wealth ( $wtot_t$ ).....	0.233 (3.351)	0.268 (2.728)			
Housing wealth ( $wh_t$ ).....			0.667 (3.724)	0.825 (3.498)	
Non housing wealth ( $wnh_t$ ).....			0.517 (2.734)	0.401 (1.523)	
Housing wealth net of mortgages ( $wh\_a_t$ )....					0.698 (3.169)
Non housing wealth gross of mortgages ( $wnh\_a_t$ ).....					0.457 (2.019)
Disposable income ( $y_t$ ).....	0.130 (5.044)	0.175 (4.722)	0.230 (4.097)	0.276 (3.600)	0.263 (3.812)

(\*)  $t$ -statistics in parenthesis.

## APPENDIX III

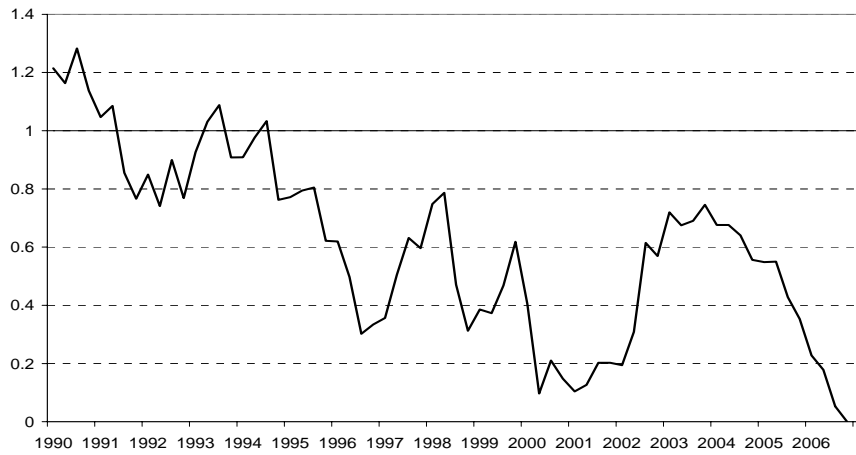
## RECURSIVE TESTS OF PARAMETER CONSTANCY

The recursive tests are based on the concentrated version of the VECM:  $R_{0t} = \alpha\beta'R_{1t} + v_t$ , where  $\beta$  is the cointegrating vector,  $\alpha$  contains the loadings of the error correction term and the rank of cointegration is set equal to one.<sup>29</sup> The advantage of this approach is that it averages out the short-run structure of the VECM, leaving the sole adjustment towards the long-run equilibrium. It is precisely on the parameters involved by this equilibrium (i.e.  $\alpha$  and  $\beta$ ) that we focus the testing procedure. We run both forward and backward recursive estimations in order to test the parameters constancy at the end and at the beginning of the sample. As for forward recursions, the baseline sample we chose is 1980q1-1990q1, whereas for the backward exercise it is 1998q4-2006q4.

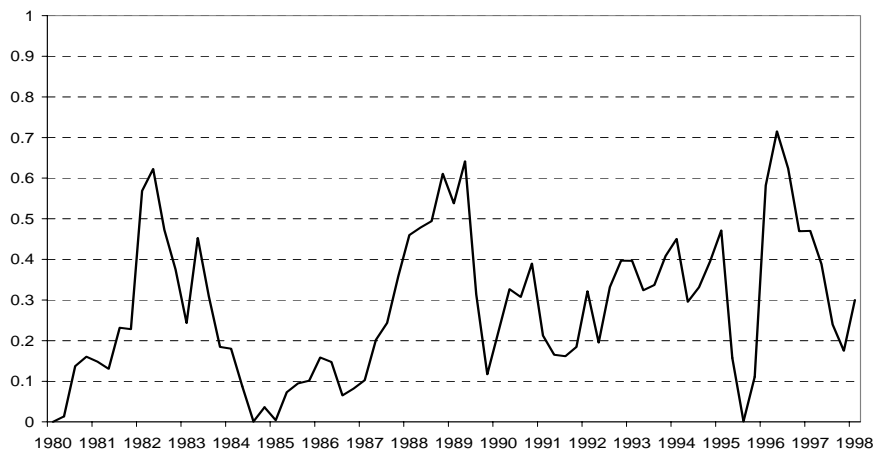
## Test for constancy of the log-likelihood (\*)

( $H_0$ : constant parameters)

## Forward



## Backward

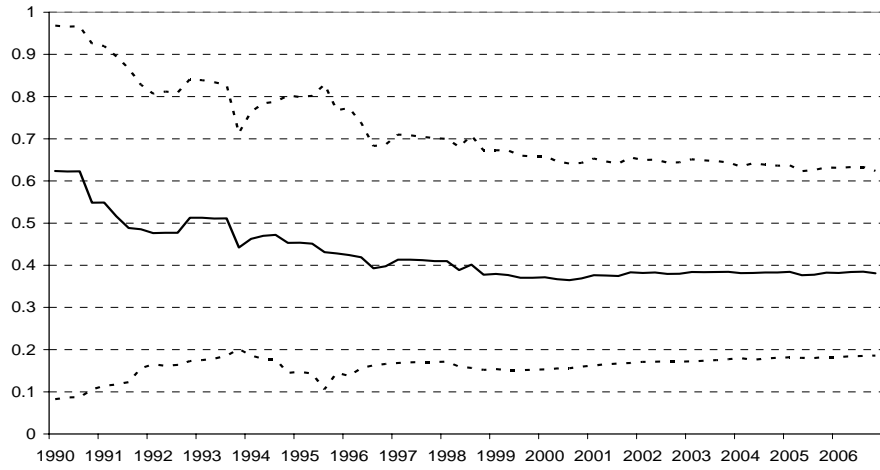


(\*) The test statistic has been scaled by the 95% quantile of the appropriate asymptotic distribution; thus a test value less than 1 implies acceptance of  $H_0$ .

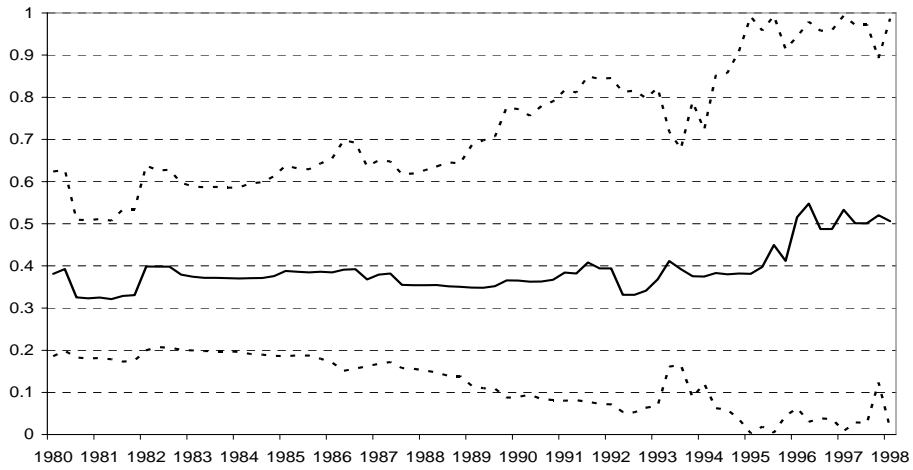
<sup>29</sup> The concentrated version can be obtained starting from the VECM  $\Delta X_t = \alpha\beta'X_{t-1} + \sum_k \Gamma_k \Delta X_{t-k} + \Phi D_t + \varepsilon_t$  and rewriting it more compactly:  $Z_{0t} = \alpha\beta'Z_{1t} + \Psi Z_{2t} + \varepsilon_t$ , with  $Z_{0t} = \Delta X_t$ ,  $Z_{1t} = X_{t-1}$ ,  $Z_{2t} = [\Delta X_{t-1}, \Delta X_{t-2}, \dots, \Delta X_{t-k}, D_t]$  and  $\Psi = [\Gamma_1, \Gamma_2, \dots, \Gamma_k, \Phi]$ . Then define the auxiliary regressions:  $Z_{0t} = B_1'Z_{2t} + R_{0t}$  and  $Z_{1t} = B_2'Z_{2t} + R_{1t}$ , with  $B_1' = M_{02} M_{22}^{-1}$  and  $B_2' = M_{12} M_{22}^{-1}$ ,  $M_{ij} = \sum_t (Z_{it} Z_{jt}')/T$ . It follows that the concentrated model is  $R_{0t} = \alpha\beta'R_{1t} + v_t$ .

Recursively calculated eigenvalue  $\lambda_I^{(*)}$

Forward



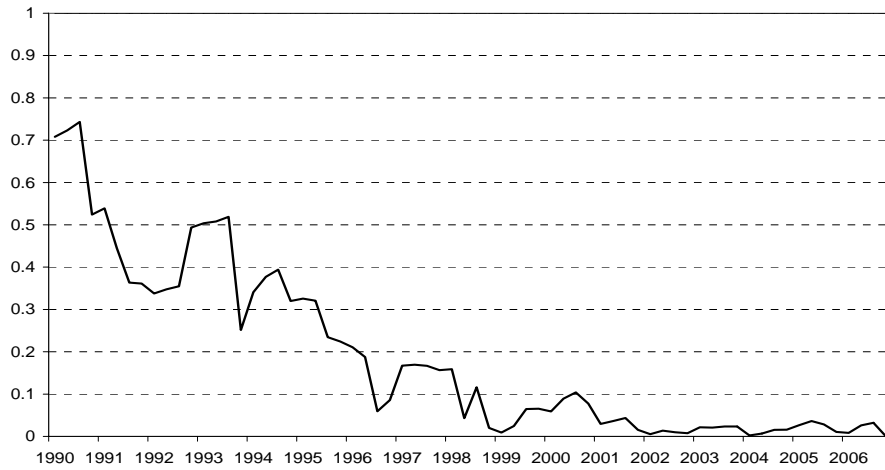
Backward



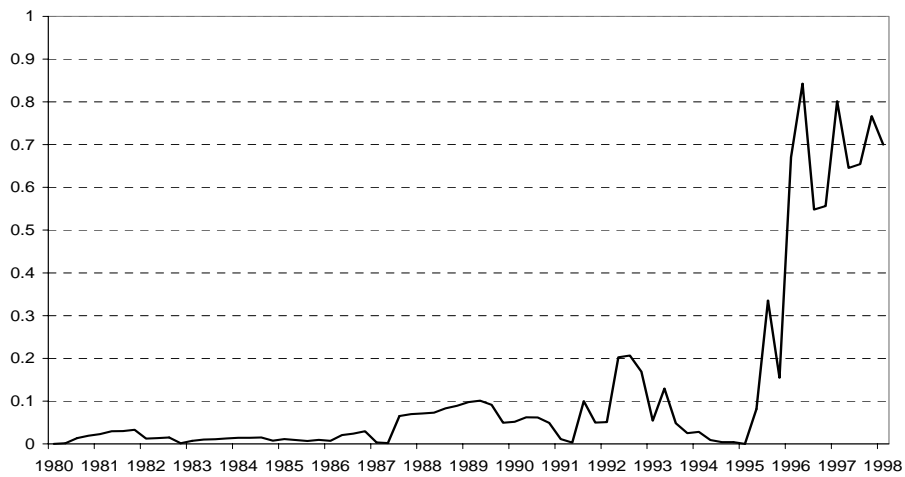
(\*) Dotted lines correspond to the 95% confidence bands.

**Eigenvalue fluctuation test<sup>(\*)</sup>**  
 ( $H_0$ : constant eigenvalue  $\lambda_1$ )

**Forward**



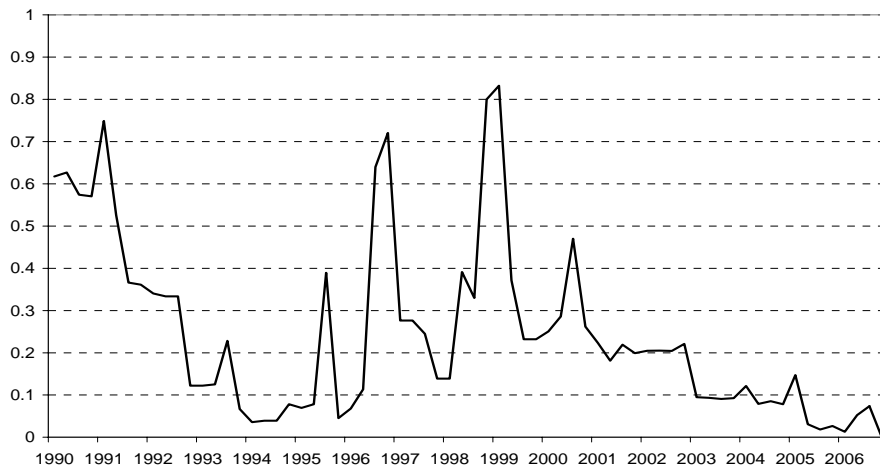
**Backward**



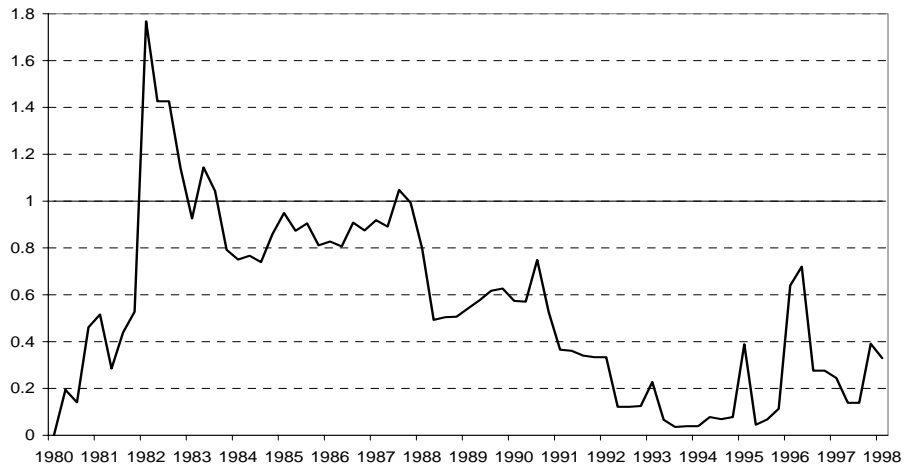
(\*) The test statistic has been scaled by the 95% quantile of the appropriate asymptotic distribution; thus a test value less than 1 implies acceptance of  $H_0$ . This test can be considered a recursive constancy check of  $\alpha$  and  $\beta$ .

**Test for  $\beta$  constancy (\*)**  
 ( $H_0$ : constant cointegrating coefficients)

**Forward**



**Backward**



(\*) The test statistic has been scaled by the 95% quantile of the appropriate asymptotic distribution; thus a test value less than 1 implies acceptance of  $H_0$ .

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## DISCUSSION OF THE PAPER BY A. BASSANETTI AND F. ZOLLINO

*Michael Ehrmann*\*

This paper takes the newly developed dataset on Italian household wealth to an old, but still interesting and topical question: it studies the marginal propensity to consume out of wealth. In essence, the paper replicates and extends Lettau and Ludvigson (2004) for the Italian case, a very laudable exercise, which yields a number of interesting results. In particular, the authors establish the following facts:

- There is a cointegration relation between consumption, wealth and income in Italy.
- Consumption and wealth respond almost exclusively to permanent shocks, making the estimates of the wealth coefficients in the cointegrating vector good approximations of the underlying long-run marginal propensity to consume.
- The marginal propensity to consume out of housing wealth is in the order of 2 cents, half the size of the marginal propensity to consume out of non-housing wealth, which is estimated at 4 cents.

These are important insights, with clear policy implications. At the same time, I would like to know more about the *evolution* of these patterns over time. We learn from the very impressive trends in the savings ratio displayed in Figure 1 that Italian households save considerably less of their income now than they did some 20 years ago. This reduction coincided with an increase in wealth. The question arising is whether the reduction in savings can be explained entirely by the increase in wealth, or whether there have been institutional changes over the last decades that allow Italian households to save less of their income, such as improved efficiency of the financial sector.

The authors argue that their econometric estimates are stable over time, and they provide evidence for this case through their tests for parameter constancy. It is worthwhile pointing out, however, that the system that has been tested to be constant contains interesting time variation that is not discussed much in the paper. In other words, *after* modelling some variation over time, parameter constancy has been achieved.

So what is the time variation I am referring to? Let's have a look at one of the estimated cointegration vectors (there are other variants in the paper, but the point I want to make here applies to all of them).

$$c_t = 0.17w_t + 0.95y_t + 0.05D_{1,t} + 0.05D_{2,t}$$

Consumption ( $c_t$ ) is modelled to be a function of wealth ( $w_t$ ) and income ( $y_t$ ). Furthermore, two dummy variables enter this long-run equilibrium relationship. Both are step dummies, i.e. they are zero prior to a certain point in time, and one afterwards until the end of the estimation period. As both enter (significantly) with a positive sign, consumption seems to have increased relative to income and wealth over time. This is indicative that the relationship between income, wealth and consumption has indeed evolved, in a way that has allowed Italian households to raise their consumption levels. This raises the question what exactly is behind the two dummy variables.

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\* European Central Bank.

The first dummy variable is equal to 1 as of the third quarter of 1992. According to the authors, it relates to the ERM currency crisis, and the deep coincident recession in Italy. While I understand that these events had serious effects on the Italian economy, I am less convinced that we should see them as exerting permanent effects.<sup>1</sup> Crises and recessions are (luckily!) by nature temporary phenomena. The reason for applying cointegration analysis for the question at hand is precisely that the authors are after long-run effects that are not affected by such temporary shifts. Their inclusion into the long-run relation needs thus to be based on a strong case that the events had long-lasting effects. While recessions and crises might trigger behavioural changes or structural reforms that could indeed be of a more permanent nature, no concrete indications in that direction are given in the paper.

The second dummy variable is equal to 1 as of the first quarter of 1998. Here, the presumption is that the upturn to EMU, with its efforts towards fiscal consolidation and the substantive decline in interest rates, as well as the formation of EMU in 1999 with its new monetary policy regime might have altered the underlying structural relationships. By institutional affiliation, I am happy to accept the notion of EMU as a permanent feature of the Italian economy; however, what is less clear to me is whether this has triggered a structural change in the economy at one point in time (and whether this point in time is necessarily the first quarter of 1998), or whether there has been a more gradual change in the economy. Conducting standard breakpoint tests could be helpful in that regard.

Given the scepticism expressed about the justification of the two dummy variables, let me propose an alternative scenario. For that purpose, it would be important to know whether the authors' model specification is the only one accepted by the data. As already mentioned, breakpoint tests could be usefully applied. Furthermore, testing whether an alternative such as a linear trend in the cointegration relation would be accepted or rejected by the data could give important information on where to look for the underlying changes. One possibility that I would have liked to see explored is the role of credit market developments.

Credit markets in Italy have evolved considerably over the sample period analysed in this paper. To give an example, Table 1 provides the ratio of debt to annual disposable income for indebted households. Across all income categories, Italian households hold considerably larger amounts of debt relative to their income nowadays than ten years ago. This increase has been particularly pronounced for mortgage loans. Such dramatic changes in financial structure will very likely affect the consumption behaviour of households, and could possibly contribute to the observed increase in consumption relative to income and wealth.

I understand that such developments are difficult to capture in empirical models. An example is provided in the recent contribution by John Muellbauer (2007), for instance. He finds that an effect of housing wealth on consumption in the United States and the United Kingdom actually *arose* with credit market liberalisation. A credit conditions index of the sort employed there might be a good candidate to explain wealth effects on consumption also in the current paper.

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<sup>1</sup> Note that the inclusion of step dummies in the cointegration vector implies a level shift in the long-run equilibrium relationship between the system variables, and as such can only be based on the assumption that the changes to be captured are of a long-run or even permanent nature.

Table 1

**Ratio of debt to annual disposable income for indebted households**

	1995			2004		
	Total	<i>of which: for house purchases</i>	<i>of which: consumer credit</i>	Total	<i>of which: for house purchases</i>	<i>of which: consumer credit</i>
Annual disposable income						
1 <sup>st</sup> quartile	125.1	249.5	31.2	165.2	393.7	36.3
2 <sup>nd</sup> quartile	80.4	112.4	27.1	104.5	168.1	36.8
3 <sup>rd</sup> quartile	57.7	76.0	19.4	96.7	159.4	22.7
4 <sup>th</sup> quartile	38.9	45.7	13.4	60.0	79.0	14.8
Total	52.2	65.0	18.2	77.9	111.0	21.1

Source: Bank of Italy, Survey of Household Income and Wealth, reproduced from Banca d'Italia (2006), p. 144.

In conclusion, the paper provides compelling evidence about the relationship between consumption, income and wealth, gives us an estimate of the marginal propensity to consume out of wealth, and also shows that consumption has stepped up relative to income and wealth. As to the latter, a search for determinants that have altered (and can potentially continue to do so) this equilibrium relationship is warranted. Once understood, this will allow us to draw policy conclusions, e.g. as to whether the recent developments have been achieved due to improvements in market efficiency, or as to possible structural reforms that can further enhance consumption levels. In that respect, a direct comparison between the results obtained in this paper and the US evidence of Lettau and Ludvigson (2004) would also be beneficial. By highlighting differences across the two studies (such as the higher correlation of consumption with wealth in the US, and the lower correlation with income) and commonalities (such as the finding that the variation in consumption is mostly driven by permanent shocks), this cross-country variability in economic structure could nicely complement the variability over time that we see in Italy, and thus strengthen our understanding of the factors at work.

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# INTERGENERATIONAL TRANSFERS IN ITALY

*Luigi Cannari\* and Giovanni D'Alessio\**

## 1. Introduction

In the economic literature there is a broad agreement that intergenerational transfers play an important role in the accumulation of household wealth. In fact, households modify their own wealth mainly by saving or dissaving, as described by the life-cycle theory, and by receiving or giving gifts and bequests.<sup>1</sup>

Understanding the role of intergenerational transfers in the creation of household wealth is important in many respects. Households who receive or expect to receive, give or plan to give transfers may change their consumption and savings, and their efforts in producing income. Thus, the presence of significant bequests might have important consequences for policy, depending on the reasons people bequeath part or all of their wealth. Furthermore, if inheritance is a way to transmit to future generations the ownership of productive capital and the control over it, it becomes a crucial factor in the efficient allocation of capital. In addition, inheritance poses a problem in terms of equality: if household wealth were primarily determined by inheritance, there would be little room for an individual to reach higher wealth classes through his/her own merits and efforts.

In this paper we measure the importance of transfers in household wealth accumulation, estimating the share of current wealth and total lifetime resources attributable to bequests and gifts, using different methods of estimation.<sup>2</sup> We then explore how transfers are distributed among the population and look at their correlation with other variables (in particular wealth and lifetime resources). Data on intergenerational transfers are mainly drawn from special sections of the 1991 and 2002 questionnaire of the Bank of Italy's Survey of Household Income and Wealth.

## 2. Measuring the importance of intergenerational transfers

The theoretical literature has emphasised three main motives for bequests. The most prominent attention has been given to the altruistic model (Becker, 1981), for which the main motive for intergenerational transfers is that parents care for their heirs. In Becker's view, bequests may assume the form of both human capital and financial transfers: as the human capital investments have a declining rate of return, financial transfers take place only when the returns to human capital investments fall below the interest rate. This implies that financial bequest concerns mainly the richest households.

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\* Bank of Italy. We are grateful to Massimo Omiccioli and Luigi Federico Signorini for their comments on a preliminary version of the paper.

<sup>1</sup> A further source of wealth variations, less investigated in the economic literature, is capital gains (see Cannari, D'Alessio and Gambacorta, 2006).

<sup>2</sup> The seminal paper by Kotlikoff and Summers (1981) spawned a large debate on the measure of the contribution of intergenerational transfers to household wealth. The discussion has involved both methodological issues, i.e. the capitalisation of returns of past transfers, and the magnitude of the share of wealth due to inheritance, which can vary between 20 and 80 per cent (Kotlikoff and Summers, 1981; Modigliani, 1988; Kessler and Masson, 1989) depending on the method of estimation. More recently the debate has extended to the distribution of transfers and their impact on wealth inequality. For recent contributions see Christelis and Weber (2007), Cox and Stark (2005), De Nardi (2004), Gokhale *et al.* (2001) Gokhale and Kotlikoff (2002), Hurd and Smith (2002), and Kopczuk and Lupton (2005).

Some other authors (Bernheim, Shleifer and Summers, 1985; Cox, 1987) have emphasised the strategic behaviour of parents who may use the promise of future bequests to induce their children to provide them with assistance in old age. In this view, the bequest is simply an exchange, where the bequests of the parents correspond to services (i.e. nursing, companionship) provided by the children. A final motive for bequest is related to uncertainty about the length of life. As parents may accumulate assets for their future needs and for precautionary motives, an early death determines an unintentional bequest (Yaari, 1965). Whatever the motive for bequest is, intergenerational transfers have an impact on the distribution of household wealth.

The importance of intergenerational transfers in the process of wealth accumulation can be measured by the share of wealth that derives from bequests and gifts. This share can be computed by different methods, relying on different assumptions, with their own merits and shortcomings.

Let  $TR_t$  be transfers (bequests and gifts) received at time  $t$ ,  $TG_t$  transfers (gifts) given at time  $t$ ,  $Y_t$  income,  $C_t$  consumption, and  $r$  the rate of return on wealth  $W_t$ . Then the accumulation of wealth can be described by the following equation:

$$W_{t+1} = W_t(1+r) + Y_t - C_t + TR_t - TG_t \quad (1)$$

As saving  $S_t$  is equal to  $Y_t - C_t$ , the current value of  $W_t$  can be expressed as:

$$\begin{aligned} W_t &= \sum_{i=1, \dots, t-1} (1+r)^{t-i-1} S_i + \sum_{i=1, \dots, t-1} (1+r)^{t-i-1} TR_i - \sum_{i=1, \dots, t-1} (1+r)^{t-i-1} TG_i = \\ &= W_t^L + W_t^R - W_t^G \end{aligned} \quad (2)$$

where  $W_t^L$  represents the life-cycle portion of wealth,  $W_t^R$  the cumulative value of received bequests and gifts and  $W_t^G$  the cumulative value of transfers already given to offspring.

The debate on the relative importance of savings and bequests in accumulation of wealth is based on decomposition (2). Some authors have concentrated on the ratio  $\lambda_t = W_t^L/W_t$ , expressing the share of wealth attributable to past saving; others have analysed the ratio  $\alpha_t^R = W_t^R/W_t$ , measuring the importance of bequests. Although the index  $\alpha_t^R$  is not the mere complement to 1 of  $\lambda_t$ , it should be close to that when computed on the living population, as the term  $W_t^G$  measures inter-vivos transfers only, which represent a very small part of intergenerational transfers.

This ratio  $\alpha_t^R$ , proposed by Kotlikoff and Summers (1981), has been criticised by Modigliani (1988) for two main reasons: first, because saving is usually defined as disposable income (including interest income) minus consumption, while in equation (2) interest income on bequests is included in the cumulative value of intergenerational transfers; second, because representation (2) implicitly assumes that the life-cycle profile of consumption is not affected by intergenerational transfers. Admittedly, this is a rather strong assumption; for instance, if the recipient consumed not only the return on bequests but even part of the bequests, then the ratio could be greater than one.

Assuming a different perspective, an index of the role in wealth assumed by intergenerational transfers could be derived by analysing its destination rather than its origin, on the base of the following equation:

$$W_t + W_t^{R*} = W_t^{G*} - S_t^* \quad (3)$$



where  $W_t^{R*}$  and  $W_t^{G*}$  represent the transfers respectively to be received and to be given in the future and  $S_t^*$  is the cumulative amount of future net saving. The equation represents the relationship between the net wealth plus the expected transfers to be received in terms of possible destinations, respectively future transfers to descendants and future dissaving.

The index can thus be defined as:

$$\alpha_t^G = (W_t^{G*} - W_t^{R*}) / W_t = 1 - (-S_t^*) / W_t \quad (4)$$

and represent the complement to 1 of the ratio of future dissaving to net wealth. The more the intergenerational transfers are important in terms of destination of present net wealth, the closer the index is to 1.

Indexes  $\alpha_t^R$  and  $\alpha_t^G$ , measured on the same population, provide different estimates as they reveal different aspects of the phenomenon:  $\alpha_t^R$  looks at the past,  $\alpha_t^G$  at the future. These estimates may differ because the counterparts of recipients and donors in a given population are not necessarily included in the same population: the donors of those who have received a transfer can be dead, while the recipients of those who plan to give a transfer may not be born yet. On a more practical level, the estimate of  $\alpha_t^R$  is based on a recall of past transfers, which may suffer from some kind of bias, while that of  $\alpha_t^G$  is based on expectations, which have their own measurement problems. Nonetheless, we believe that the comparison between the two indexes can help to shed light on the importance that households assign to future transfers. The relevance of this view is plain, as the bequest motive is a well-known factor influencing the saving behaviour of households.

A serious problem of these measures comes from the relationship between wealth, transfers and age. The ratio  $\alpha_t^R$  is computed by averaging wealth and transfers over the whole population; thus it will depend on the population structure: in a population mainly made up of elderly people, for instance, many of them will have already received bequests from their parents and the numerator will be greater than in a young population, whose members have not yet received bequests. Analogous considerations hold for the index  $\alpha_t^G$  when the expected transfers are taken into account.

The denominator will depend on the average age of the population too: it will be lower in a young population, whose members have not had the time to accumulate wealth and have not yet received bequests; it will be greater when the average age is near to retirement; it will decrease in an elderly population, whose members have already consumed part of their life-cycle wealth and transferred assets to their offspring.

Similarly, the role of intergenerational transfers on wealth distribution could be incorrectly displayed by these measures as they depend on the age structure of the population and the intergenerational age gap. Let us consider the hypothetical situation of a population whose members earn the same income, have the same consumption expenditure and receive the same bequests at the same age, say  $t_0$ . We would say that in this hypothetical world bequests do not contribute to wealth inequality. According to equation (5), on the contrary, we would find that bequests account for a large share of wealth inequality, because in any period there will be individuals (of age  $t \geq t_0$ ) who have already received bequests and individuals (of age  $t < t_0$ ) who have not yet received bequests.

To overcome these shortcomings some changes have to be made in the above measures: a) the flow of inheritance should be considered in a lifetime perspective; b) the amounts should be discounted at a fixed age. In this view, the analysis of

intergenerational transfers can be based on the relationship equating sources and destinations of lifetime resources:

$$LY + LT^R = LC + LT^G \quad (7)$$

where  $LT^R = \sum_{i=0, \dots, d} (1+r)^{-i} TR_i$ ;  $LY = \sum_{i=0, \dots, d} (1+r)^{-i} Y_i$ .

$$LT^G = \sum_{i=0, \dots, d} (1+r)^{-i} TG_i; \quad LC = \sum_{i=0, \dots, d} (1+r)^{-i} C_i.$$

In a lifetime perspective, an index describing the role of intergenerational transfers analogous to the index  $\alpha_t^R$  can be thus derived as:

$$\beta^R = LT^R / (LT^R + LY) \quad (8)$$

In equation (7) bequests and income are discounted over the life span of each individual, ranging from 0 to  $d$  (the date of death). The ratio  $\beta^R$  does not depend on the population structure; when looking at the impact of transfers on wealth inequality the ratio  $\beta^R$  is therefore to be preferred to  $\alpha_t^R$ , which depends on the average age of the population.

An alternative index of the role of intergenerational transfers, analogous to the index  $\alpha_t^G$ , may be derived analysing the destination of lifetime resources:

$$\beta^G = LT^G / (LT^G + LC) = LT^G / (LT^R + LY) \quad (9)$$

$\beta^R$  and  $\beta^G$  shed light on different aspects of wealth accumulation: while the index  $\beta^R$  evaluates the transfers from the point of view of the recipients (those who receive gifts and bequests),  $\beta^G$  assumes the point of view of the donors (those who intend to transfer wealth to their offspring); the latter indicator represents the intergenerational transfers (as a share of total resources) that individuals have already given or intend to give in the future to their children.

The difference between these estimates can be useful to understand the importance of changes in the propensity to transfer wealth to heirs, once unintentional bequests and the demographic changes (and in particular the change in the number of children) have been taken into account. Both these measures are reported in the following sections.

Moreover, from equation (7) it follows that the difference between the transfers given and those received in a lifetime corresponds to the cumulative lifetime savings. i.e. a sort of lifetime added wealth measure:

$$LY - LC = LT^G - LT^R = LS \quad (10)$$

This quantity may help in understanding the role that people assign to the well-being of descendants.

### 3. The Bank of Italy's Survey of Household Income and Wealth

Our source of information is the Survey of Household Income and Wealth (SHIW) conducted by the Bank of Italy yearly from 1965 to 1987 (except for 1985), every other year until 1995 and from 1998 on (the reference is to the year *for* which, not *in* which, the survey is conducted). The SHIW seeks to gather information on household microeconomic behaviour. The sample size is about 8,000 units per year. The basic survey unit is the "household", defined as a group of individuals linked by ties of blood, marriage or affection, sharing the same dwelling and pooling all or part of their incomes. Institutional population is not included. Data are collected in personal interviews

conducted by professional interviewers. Participation is voluntary and not remunerated. As a result, the response rate is low, ranging in the last seven surveys between 33 per cent in 1991 and 58 in 1993. Further methodological details on the SHIW are given in Banca d'Italia (2002, 2004, 2006), Brandolini and Cannari (1994) and Brandolini (1999); on Italian wealth see also Cannari and D'Alessio (2006).

Detailed data have been collected continuously on the social and demographic characteristics of household members and their incomes and, since 1980, on consumption expenditure. Estimates of households' tangible assets are also available from the outset. Financial assets have been surveyed irregularly and dissatisfaction with the quality of the answers has led to frequent changes in the format of the questions: figures on a fairly comparable basis exist only from 1987 onwards. Raw data on tangible assets are collected on an individual basis and then aggregated by household, whereas financial assets are surveyed at the household level.

This basic information on household wealth is complemented with two types of data on intergenerational transfers. In the surveys for 1991 and 2002 a special module was inserted in the questionnaire to ask household members the amount and timing of inheritances and gifts received from the previous generation (Banca d'Italia 1993 and 2004). In the 2002 survey, in particular, household heads and their spouses/cohabitants were asked to indicate both the value of the transfers (bequests and gifts) made and received during the respondent's lifetime and those that they expected to make or receive in the future.<sup>3</sup> The detailed wording of the questions is reported in Appendix B.

The second piece of information relates only to the dwellings owned by the household, but it has been asked on a continuous basis since 1987. Respondents have to specify how dwellings were acquired. Each individual property is identified as having been purchased, built to order by the household, inherited or received as a gift. In addition, respondents supply data on the year they became the owners.

Both for 1991 and 2002 the two sources of information on inheritances have been merged, cross-checked and integrated; this explains why figures in this paper are higher than those based on the special modules alone.<sup>4</sup>

As common in sample surveys, SHIW data also are affected by non-response, unwillingness to declare assets and the tendency to undervalue the declared asset holdings; these phenomena are typically correlated with household wealth. We refer the reader to Brandolini *et al.* (2004) for an extensive discussion of the relevance of such distortionary effects in the SHIW as well as for a detailed description of the adjustments adopted to correct for non-responses, non-reporting and under-reporting.

We define household net worth as tangible assets (i.e. consumer durables, jewellery and other valuables, real estate and unincorporated businesses) plus financial assets (transaction and savings accounts, government bonds, equities and other assets) less financial liabilities (mortgages and other debts).

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<sup>3</sup> The SHIW is not the only source of information on intergenerational transfers in Italy. Information is also collected by the survey SHARE (see [www.share-project.org](http://www.share-project.org) and, for intergenerational transfers, Christelis and Weber, 2007), with questions similar to those used in the HRS (see Hurd and Smith, 2002).

<sup>4</sup> As the questions in the special modules on inheritance were asked after information had been provided on houses owned (*How did the household acquire ownership?*), sometimes the respondents did not report the same information, even though it was required. Where information on inherited houses was found and the household did not report any transfer, a record was added. In cases where both inherited houses and transfers were found, a conservative strategy was applied, adding information on transfers only when the amount or the year of the transfer were very different.

#### 4. Traditional measures of the role of intergenerational transfers

##### 4.1 Direct evidence from the 1991 and 2002 SHIW

In 1991 about 26 per cent of households declared they had received transfers for an average amount of 41,704 euros at 2002 prices (Table 1). The share of intergenerational transfers in net worth was 30.9 per cent (25.2 from inheritances and 5.7 from gifts). Assuming a real interest rate of 2 per cent per year and adjusting for the income stream produced by transferred assets, the amount would rise to 66,017 euros at 2002 prices and the share to 48.9 per cent.<sup>5</sup>

Table 1

#### Intergenerational received transfers, 1991 and 2002

(euros)

	1991		2002	
	Average (*)	Ratio to net wealth	Average	Ratio to net wealth (**)
<b>All households</b>				
Without capitalisation				
Inheritance .....	34,057	25.2	51,485	28.7
Gift.....	7,647	5.7	8,937	5.0
Total received transfers .....	41,704	30.9	60,422	33.6
With capitalisation				
Inheritance .....	53,044	39.3	85,489	47.6
Gift.....	12,972	9.6	13,217	7.4
Total received transfers .....	66,017	48.9	98,706	54.9
Net wealth	135,041	100.0	179,649	100.0
<b>Recipient households</b>				
Received transfers .....	163,057	83.3	178,785	63.3
Capitalised received transfers ....	258,114	131.9	292,067	103.4
Net wealth.....	195,696	100.0	282,400	100.0
<b>Non-recipient households</b>				
Received transfers.....	0	0.0	0	0.0
Capitalised received transfers ....	0	0.0	0	0.0
Net wealth.....	114,196	100.0	127,196	100.0
Net wealth of recipients minus net wealth of non-recipients.....	81,500	-	155,204	-

(\*) Amounts for 1991 are expressed at 2002 prices.

(\*\*) Net wealth for 2002 is the estimate obtained on the random sub-sample of those to whom the special module on intergenerational transfers was submitted.

Source: Our calculations based on data from the SHIW.

<sup>5</sup> In the United States, in the 1992 Survey of Consumer Finances 20.7 per cent of households reported they had received wealth transfers. The present value of all inheritances received up to 1992 and accumulated at a real interest rate of 3 per cent amounted to 25.8 per cent of household net worth (Wolff, 2002, p. 261; see also Brown and Weisbenner, 2002).

In the 2002 survey the share of households who declared they had received transfers is higher than that observed in 1991 (33.8 compared with 26 per cent). The average amounts of the total received transfers are about 45 per cent higher than those observed in 1991; the share in terms of net wealth, however, is only 2.7 percentage points higher (33.6 compared with 30.9 per cent), as wealth too has grown rapidly (33 per cent).<sup>6</sup> Adjusting for the income stream produced by transferred assets (using the same interest rate of 2 per cent per year as above), the amount would rise to 98,706 euros while the share to net wealth would increase to 54.9 per cent, compared with 48.9 per cent in 1991.

Both in 1991 and 2002, households receiving transfers turned out to be on average richer than those reporting no transfers. If the income stream produced by transferred assets is taken into account, the average wealth of recipients is lower than the received transfers, implying a negative impact of bequests on the saving behaviour of the heirs.

The 2002 survey collected information not only on received transfers but also on transfers given to the offspring. The latter does not include bequests, but only inter-vivos transfers. The share of households that have already given transfers is smaller than the share of households that have already received transfers (3.6 compared to 33.8 per cent; see Table A1 in Appendix); the average size of given transfers, adjusted for the income stream, is small (4,690 euros) compared with received bequests.

The age profiles of total wealth, life-cycle wealth (computed according to equation (2), with capitalisation of returns) and transfers are shown in Table A2 and Figure 1. Both kinds of transfers (received and given) increase with age; net wealth reaches its maximum in the age class 51-60 years (near retirement age) and declines thereafter; the decline in life-cycle wealth is steeper and the amount of life-cycle wealth becomes close to zero over 71 years.<sup>7</sup>

Looking at the destination of wealth, the share of households who plan to leave an inheritance is far greater than that of those who expect to receive one (58.6 compared with 12.6 per cent; Table A1 in Appendix). The discrepancy is even greater when computed on the amounts, as the average inheritance that households plan to leave to their descendants (about 130,000 euros) is approximately 8 times the corresponding amount of transfers households expect to receive in the future (about 16,000 euros). Once the amounts are considered at present value, i.e. discounted at a 2 per cent rate of interest, the gap decreases but remains high (77,012 versus 12,459 euros). This result may be due to the average age of household heads (55 years in the sample). At age of 50, many households will have already received bequests and the amount to be received will be small compared with what they plan to leave. In addition, the discrepancy may depend on uncertainty about the expenditures that will be necessary in the final years of life (healthcare or surgery); this expenditure could be disregarded by the donors (as not depending on his/her will) or overestimated by the potential recipients (see, for instance, Brown and Weisbenner, 2002).

The age profile of the amounts (at present value) shows that the transfers households expect to receive decrease with age while the transfers households expect to leave, like the wealth curve, reach a maximum (about 150,000 euros) in the age group 51-60 years (Figure 2).

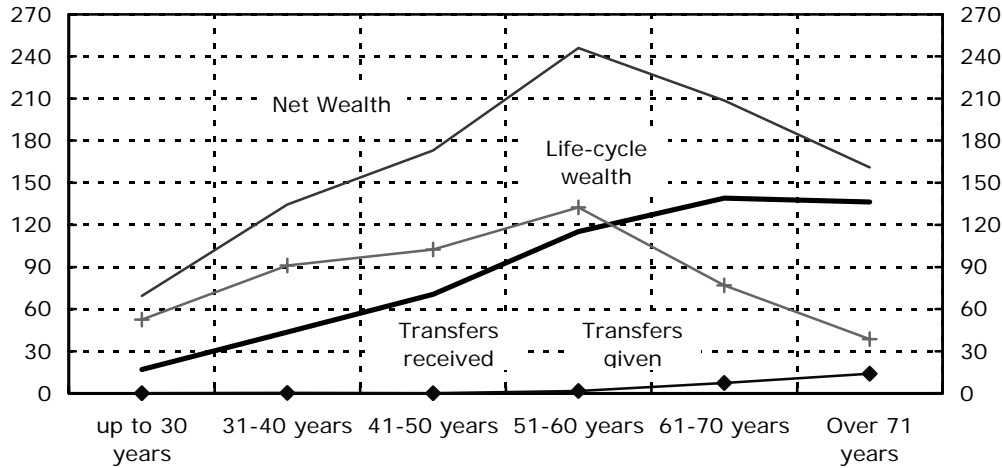
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<sup>6</sup> Between 1991 and 2002 real capital gains contributed approximately 40 per cent to the growth of household wealth (Cannari, D'Alessio, Gambacorta, 2006).

<sup>7</sup> The age profiles, estimated on the basis of a cross-section survey, can be affected by spurious cohort effects. In Italy, the net wealth profile observed in the past decades is similar to that shown in Figure 1, although the most recent years are characterised by lower values for young people and higher values for the elderly.

Figure 1

**Household net wealth by origin, 2002**  
(thousands euros)



Source: Our calculations based on data from the SHIW. Transfers include the capitalisation of interest.

On average, future dissaving is equal to 64.1 per cent of net wealth; the  $\alpha_t^G$  index, which represents a measure of how important future transfers are for households, is thus equal to its complement to 1, i.e. 35.9 per cent, lower than the corresponding index  $\alpha^R$  (54.9 per cent). The age profile of the future net dissaving tends to increase until retirement age and to decrease thereafter, when wealth is decumulated.

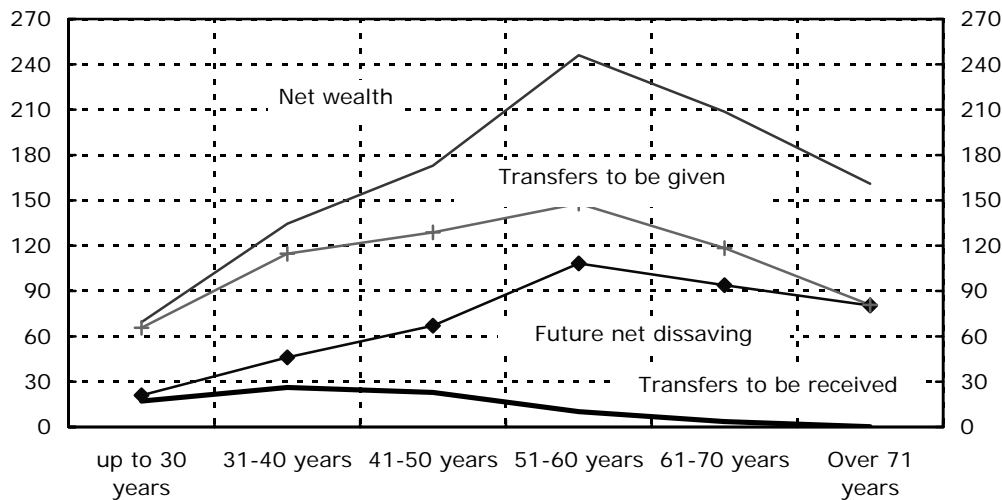
To sum up, these results show that a large share (54.9 per cent) of net wealth is attributable to intergenerational transfers and that households plan to give their offspring a smaller share of wealth (35.9 per cent) than they have received. This result, however, has to be taken cautiously for three main reasons: 1) transfers that households plan to give to their children do not include unintentional bequests; on the contrary, unintentional bequests are included in received transfers; 2) in many cases (in particular for dwellings) the interviewees did not remember the value of received transfers at the time they received them and provided the interviewers with the value of assets at the time of the interview; thus, the value of received transfers includes the capital gains occurred in the period. On the contrary, the value of transfers to be given does not include, by definition, future capital gains; 3) although the interviewees were requested to provide their best estimate of planned transfers, taking into consideration actual and future children, it was very difficult for young couples (especially those without children) to provide an answer.

In addition, the lower amount of given bequests compared with received ones depends on the capitalisation of interest and demographic changes. If we look at the non-capitalised average amounts per household, transfers received over the whole life span are smaller than transfers given over the life span. This difference increases in per capita terms, i.e. taking into consideration the decline in the number of children.<sup>8</sup>

<sup>8</sup> In Italy the total fertility rate (number of children per woman) has declined from 2.7 in 1965 to 1.32 in 2005. This rate is among the lowest in the European Union: only Spain and Greece show fertility rates lower than Italy's.

Figure 2

**Household net wealth by destination, 2002**  
(thousands euros)



Source: Our calculations based on data from the SHIW. Transfers include the capitalisation of interest.

#### 4.2 The estimate of inherited wealth based on houses

A further estimate can be obtained, for real estate only, using the method proposed by Barca, Cannari and Guiso (1994). The SHIW collects data on the way houses were acquired. Each individual property is identified as having been purchased, built to order by the household, inherited or received as a gift. In addition, respondents supply data on the year they became the owners, making it possible to calculate the capitalisation of the returns on bequests. The value of wealth inherited in the form of real estate is given by:

$$W_t^E = \sum_{k=1}^t \left[ \frac{(1+r)}{(1-p)} \right]^{t-k} E_k$$

where  $E_k$  is the value of the inherited dwelling at time  $k$ . The probability  $p$  of an inherited property being sold is estimated at 0.92 per cent on an annual basis. The gross rate of return used for capitalisation (based on survey data) is equal to 2 per cent (net of depreciation).

The share of intergenerational transfers (bequests plus gifts) on total net wealth, without capitalisation, ranges from 23.6 in 1991 to 34.9 per cent in 2004. Adjusting for capitalisation the estimates become 34.4 and 56 per cent respectively (Table 2). The estimates for 1991 and 2002 are similar to those derived from the direct evidence above.

While basic estimates are very similar to those of Barca, Cannari and Guiso (1994), the estimates correcting for the probability of sale and for capitalisation are a little greater. The discrepancies are mainly due to the length of the period between the date of the survey and the year in which households acquired the property, which is longer in the most recent waves.

On the basis of these figures, we again conclude that bequests play a significant role in the accumulation of wealth. In addition, this role turns out to have increased over the years (see Figure 3).

Table 2

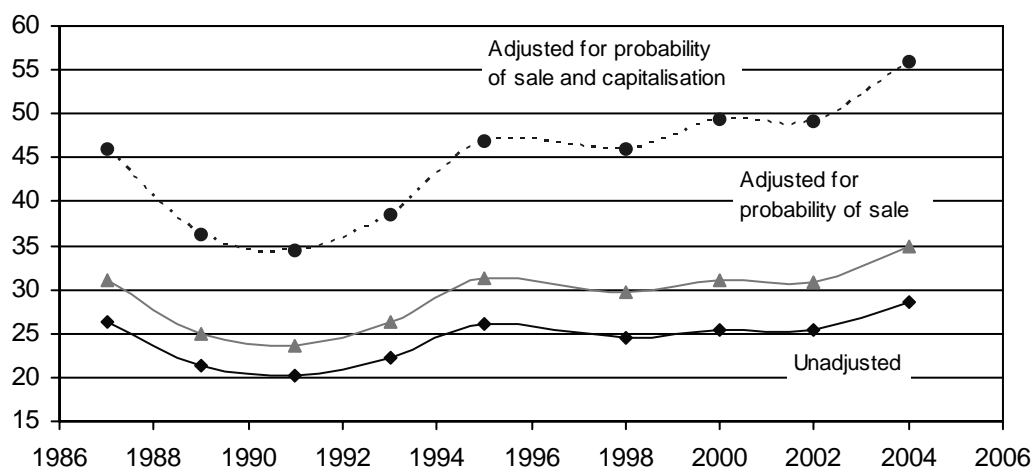
**Wealth in the form of real estate inherited or received as a gift in 1987-2004**

	Share of household who received a real estate transfer	Total intergenerational transfers in the form of real estate					
		Not correcting for probability of sale	Correcting for probability of sale	Correcting for probability of sale and capitalising	Not correcting for probability of sale	Correcting for probability of sale	Correcting for probability of sale and capitalising
		(euros at 2004 prices)			(ratio to net worth)		
1987 ...	25.4	29,166	34,464	50,863	26.3	31.1	45.9
1989 ...	23.6	26,948	31,442	45,478	21.4	25.0	36.2
1991 ...	24.7	29,807	34,821	50,728	20.2	23.6	34.4
1993 ...	26.4	37,850	44,827	65,782	22.2	26.2	38.5
1995 ...	29.4	43,854	52,498	78,999	26.0	31.2	46.9
1998 ...	28.7	44,404	53,664	83,008	24.5	29.7	45.9
2000 ...	29.3	47,890	58,692	93,594	25.3	31.0	49.4
2002 ...	28.7	49,542	60,357	96,088	25.3	30.8	49.1
2004 ...	29.1	60,974	74,578	119,905	28.5	34.9	56.0

Source: Our calculations based on data from the SHIW-HA.

Figure 3

**Value of real estate inherited or received as a gift, 1987-2004**  
(percentage ratio to net worth)



Source: Our calculations based on data from the SHIW-HA (Version 2.0, June 2006).



### 4.3 Evidence based on the flow-to-stock conversion method

Survey estimates of inherited wealth may suffer from various biases due to careless recall or under-reporting. An alternative estimate of the role of inherited wealth can be obtained using data on the flows of inheritance observed in one year (Kotlikoff and Summers, 1981; Modigliani, 1988). For a growth rate of per capita output equal to  $n$  and an interest rate equal to  $r$ , assuming that interest is capitalised, the stock of inherited wealth is:

$$W^e = B(e^{(r-n)g} - 1)/(r - n)$$

where  $B$  represents the yearly flow of bequests and  $g$  the age gap between parents and descendants.

The flows of inheritance in one year can be estimated by applying the mortality rate (by sex and age) to the corresponding sample; the sum over all the sample of the product of the wealth held by each person – under the assumption that net worth is equally shared among parents – and the corresponding mortality rate can be interpreted as the mean value of the inheritances in that year.

On the base of the estimated age gap between parents and offspring the shares of net wealth deriving from inheritances can be estimated under various hypotheses of constant yearly rates of growth and rates of returns.

Table 3

**Inherited wealth estimates based on the flow-to-stock method**

Year	Flows/ net wealth	Average gap (in years) between parents and offspring	Share of inherited to total wealth under various hypotheses (*)				
			r-n=0%	r-n=0.5%	r-n=1%	r-n=2%	r-n=3%
1989 ...	0.90	29.6	26.7	28.8	31.1	36.4	43.0
1991 ...	1.04	29.9	31.1	33.6	36.3	42.6	50.4
1993 ...	0.90	29.9	26.8	28.9	31.2	36.6	43.3
1995 ...	0.98	29.9	29.3	31.6	34.1	40.1	47.4
1998 ...	1.12	29.9	33.4	36.1	39.0	45.8	54.1
2000 ...	1.35	30.0	40.4	43.5	47.1	55.3	65.4
2002 ...	1.13	30.3	34.2	36.9	40.0	47.0	55.7
2004 ...	1.12	30.5	34.0	36.7	39.8	46.8	55.6

Source: Our calculations based on data from the SHIW.

(\*)  $n$  = yearly rate of growth;  $r$  = rate of return. The coefficients are supposed constant over time. In case  $n=r$  the share  $W^e = B g$ .

Under all the hypotheses considered, the share of inheritances in wealth grows from 1989 to 2004, due to the growth of both the average gap and the estimated annual flows of inheritance (Table 3); the latter, in turn, reflects the better conditions of older people in more recent years compared with the early 1990s.<sup>9</sup>

<sup>9</sup> Clearly, this measure does not account for gifts and other intergenerational transfers occurring before the death of the donor. On the other hand, the previous method could overestimate the amount of the flows, as no attention is paid to the negative correlation between wealth and mortality rate (Attanasio and Hoynes, 2000).

Following the above scheme, the role of intergenerational transfers in wealth accumulation decreases with income growth and increase with the increase in the returns on capital. In Italy, the rate of growth of income has been declining over the period analysed; as to capital returns, while real interest rates decreased significantly, capital gains both on shares and on dwellings largely sustained the returns on capital. All in all, it is likely that the slower growth in income and the increasing capital gains have contributed in amplifying the role of inheritances.

#### 4.4 *The role of intergenerational transfers over the life span*

Estimates provided in the previous sections show that intergenerational transfers play an important role in the accumulation process. On average, received transfers represent a share of households' net wealth ranging from 30 to 55 per cent, depending on the method applied.

As shown in Section 2, however, these measures can be influenced by the age of individuals. This shortcoming can be overcome if the amount of transfers is computed in a lifetime perspective, a scheme which differs from the traditional approach for three main reasons: a) it takes into account both the transfers that households have received and those that households will receive in the future (or those given and those to be left); b) it considers the present value of transfers at a fixed age; c) it considers the amount of transfers as a share of lifetime resources (instead of net wealth).

In the following, the computational tasks involved in these three steps are described in detail.

*Lifetime income and transfers. Using 2002 SHIW data, the computation of intergenerational transfers can easily be extended to transfers that households will receive in the future, as a specific question on expectations was asked in the questionnaire. Although expectations may differ from actual transfers, they can be considered relatively good proxies of what households will receive.*

In order to estimate the present value of inheritance to be received we resort to the expected residual life of the household head's parents; similarly, the present value of future transfers to be left to descendants is computed using the expected residual life of the household head and his/her spouse. The underlying hypothesis that all future transfers take the form of bequests does not seem too strong because, according to survey data, they make up more than 80 per cent of transfers.

As already shown in Section 2, the present value of transfers depends on the difference between the household head's age and his/her age at the time when the transfers occurred. Equal transfers received at different times and ages of the household head have different values that depend on capitalised returns.

To control for such heterogeneity, we compute the present value of transfers, past and future, at a fixed age of 15 years. The rate of return is fixed at 2 per cent.

The computation of lifetime income, in order to obtain household lifetime resources, is a demanding task. While the year at which the employed persons started to work is known from the survey, information on periods of unemployment in the past is unknown; in addition, the year of death of individuals is unknown, although its average value can be estimated on the basis of demographic information. In general difficulties arise because SHIW data provide a picture of household income in a single year only, while longitudinal data over the life span would be required.

Lifetime income is obtained summing the income from labour or pensions ( $Y_t$ ) estimated at each age of the household head. At any age, income (in log) is made up of three components:

$$\log Y_t = X\beta + f(\text{age}) + u_t \text{ where } u_t = \rho u_{t-1} + e_t \text{ and } e_t \text{ is N.i.i.d.}$$

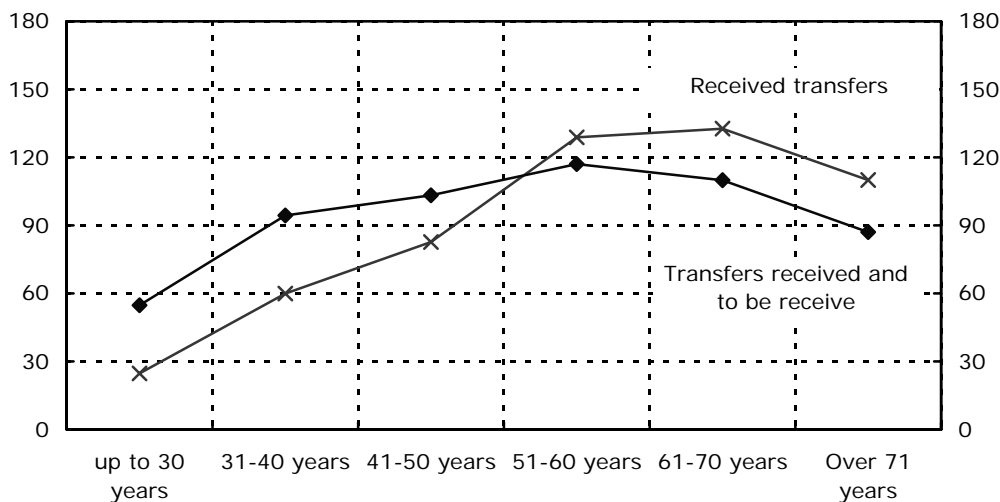
The first component ( $X\beta$ , where  $\beta$  is a vector of parameters to be estimated) accounts for the invariant characteristics ( $X$ ) of individuals (i.e. sex, education, geographical area); the second component ( $f(\text{age})$ ) is a quadratic function of age; the third is a residual, which is assumed to follow a first order autoregressive process. The parameter  $\rho$  has been estimated by resorting to the panel sample 1998-2002 (which provides an estimated coefficient close to 0.9).<sup>10</sup>

Intergenerational transfers of lifetime resources. *The ratio of transfers received over the whole life span to the total amount of resources, both discounted at the age of 15, is on average equal to 4.6 per cent, a significant share considering the large size of the denominator (Table A3).*

The age profile of both received and expected intergenerational transfers is much flatter than that observed for received transfers at a given age (Figure 4); the younger generations, however, maintain the worst conditions in terms of received transfers. Although this result could depend on the underestimation of the value of inheritances, which for young people may appear far in the future, it is also possible that it reveals negative expectations of the young.

Figure 4

**Received transfers by age, 2002**  
(index 100 = all ages)



Source: Our calculations based on data from the SHIW. Transfers include the capitalisation of interest.

<sup>10</sup> The correlation coefficient  $\rho$  has been estimated taking into account the measurement errors in income data, as estimated by Biancotti, D'Alessio and Neri (2004).

## 5. Intergenerational transfers: distribution and correlation with other variables

In this section we look at the distribution of transfers, their concentration and their correlation with other variables, in order to provide the reader with useful information to assess the impact of intergenerational transfers on inequality.

This assessment is very complex and in many respects is a value judgment, because people differ in their views on inequality.

Some people argue that inequality does not change when all resources are increased in the same proportion (the relative criterion); others argue that inequality does not change when an equal amount is added to all previous resources (the absolute criterion). As Atkinson and Brandolini (2005) write, there is no a priori reason to rank one criterion over the other.

Table 4

### Distribution of transfers among the population

	Transfers		Capitalised transfers (2% yearly)		Lifetime transfers (discounted at 15 years)	
	Given	Received	Given	Received	Given and planned	Received and expected
Household deciles.....						
Up to 1st decile .....	0.0	0.0	0.0	0.0	0.0	0.0
From 1st to 2nd decile ..	0.0	0.0	0.0	0.0	0.0	0.0
From 2nd to 3rd decile ..	0.0	0.0	0.0	0.0	0.0	0.0
From 3rd to 4th decile ..	0.0	0.0	0.0	0.0	1.9	0.0
From 4th to 5th decile ..	0.0	0.0	0.0	0.0	3.9	0.0
From 5th to 6th decile ..	0.0	0.0	0.0	0.0	6.2	0.0
From 6th to 7th decile ..	0.0	0.4	0.0	0.3	8.7	2.1
From 7th to 8th decile ..	0.0	5.4	0.0	4.6	12.4	7.5
From 8th to 9th decile ..	0.0	15.4	0.0	13.5	17.9	16.8
Over the 9th decile .....	100.0	78.8	100	81.6	49.0	73.5
Top 5 per cent.....	100.0	63.8	100.0	67.1	34.8	57.9
Top 1 per cent.....	73.6	32.3	75.1	36.1	16.2	28.3
Top 0.5 per cent.....	54.2	18.0	55.6	22.7	11.1	16.3
Gini index .....	0.987	0.887	0.988	0.898	0.671	0.860

Source: Our calculations based on data from the SHIW.

People looking at the space of opportunities or at the different nature of transfers and earned wealth will have different views on the impact of transfers on inequality than people looking at the space of disposable resources. Some people will have little doubt that intergenerational transfers represent a clear source of inequality of opportunity, because they provide individuals with different resources at the beginning of their life;

others will think that transfers are not the result of individuals' merits and efforts while income has to be earned, and therefore it would be preferable to use some welfare function instead of to look at the distribution of wealth; others will think that what matters is (present and future) consumption and therefore it is the total amount of resources to be considered and not their origins. Having in mind these different views, the aim of this section is not to assess the impact of transfers on inequality but to provide readers with information useful to make their own judgment.

Transfers are extremely concentrated: the Gini index of received transfers is 0.89 while that of given transfers is 0.99 (Table 4).

As already mentioned, the amount of transfers, received and given, increases with age, introducing a spurious effect in the analysis of its distribution among population.<sup>11</sup> It is not surprising that lifetime transfers are less concentrated than the corresponding phenomena described so far; the Gini index of the transfers received and expected is 0.86 (compared with 0.89 for the transfers received until the moment of the interview); that of the transfers given or planned for the descendants is 0.67 (compared with 0.99).

Although reduced, the lifetime transfers appear also highly concentrated when compared with family income or net wealth (the Gini index is 0.36 and 0.62 respectively) or lifetime income and consumption (both 0.38). The top 5 per cent of households receive more than half of all the transfers while the top 10 per cent receive approximately three quarters; on the other hand, the top 10 per cent of households have transferred or have planned to transfer approximately half of all the transfers.

Households receiving transfers show higher levels of lifetime income, consumption, net wealth and given transfers than non-recipient households (Table 5). Computed on the recipients, which represent approximately 40 per cent of the population, the ratio of transfers received over the whole life span to the total amount of resources is on average 9.4 per cent. For the top 10 per cent of households with the highest received transfers, the ratio of transfers to total lifetime resources is equal to 22 per cent.

The gap in terms of lifetime income between those who receive transfers and those who do not, is equal to 25.7 per cent; it becomes 38.8 per cent in terms of lifetime resources. Households belonging to the top 10 per cent of the distribution of transfers have a lifetime income approximately 40 per cent higher than those who do not receive transfers; the gap becomes 80 per cent after the transfers are taken into account.

In terms of lifetime consumption the gap between the households receiving transfers and the others is narrower than that observed for lifetime resources (36.4 compared with 38.8 per cent) as the former households transfer a higher absolute amount of their lifetime resources to their descendants.

The correlation between the capitalised received transfers (until the date of the interview) and net wealth is positive and equal to 0.39; on the contrary, the correlation between transfers and life-cycle wealth is negative (-0.72).

The coefficient of variation of net wealth is lower than that of life-cycle wealth (computed as the difference between net wealth and transfers). Richer households receive higher transfers but, as a proportion of their current wealth holdings, transfers are greater for poor households than rich ones (Table A5).

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<sup>11</sup> For this reasons in this paragraph we concentrate the analysis on the variables referring to the whole life span (and discounted at the age of 15), unless clearly specified otherwise.

Table 5

**Lifetime transfers and resources of descendants  
by educational qualification of fathers**

	Share of population	Received capitalised transfers	Lifetime income	Lifetime resources	Lifetime consumption	Given capitalised transfers
	(percent)	Average amount (discounted at 15 years old)				
Educational qualification of the father of the household head <sup>(1)</sup>						
None .....	28.1	23,330	669,442	671,727	650,682	21,045
Elementary school ..	46.8	49,481	1,130,139	1,134,588	1,089,555	45,032
Middle school .....	13.8	48,645	1,450,890	1,464,713	1,429,891	34,822
High school .....	7.1	127,922	1,501,860	1,562,701	1,495,620	67,081
University degree ...	3.2	188,058	1,519,398	1,651,602	1,595,748	55,854
Received transfers						
Non-receiving						
Households.....	58.9	0	900,573	900,573	877,212	23,361
Total receiving .....	41.1	117,25	1,132,326	1,249,576	1,196,364	53,211
of which top 10% ..	10.0	353,374	1,262,846	1,616,220	1,514,472	101,749
Total .....	100.0	48,202	995,848	1,044,050	1,008,417	35,633
Share of lifetime resources (percentages)						
Educational qualification of the father of the household head <sup>(1)</sup>						
None .....	-	3.5	99.7	100.0	96.9	3.1
Elementary school ..	-	4.4	99.6	100.0	96.0	4.0
Middle school .....	-	3.3	99.1	100.0	97.6	2.4
High school .....	-	8.2	96.1	100.0	95.7	4.3
University degree ...	-	11.4	92.0	100.0	96.6	3.4
Received transfers						
Non-receiving						
Households.....	-	0.0	100.0	100.0	97.4	2.6
Total receiving .....	-	9.4	90.6	100.0	95.7	4.3
of which top 10% ..	-	21.9	78.1	100.0	93.7	6.3
Total .....	-	4.6	95.4	100.0	96.6	3.4

Source: Our calculations based on data from the SHIW.

Table 6

**Correlation coefficients among  
transfers, income, consumption and wealth**

	Transfers received	Transfers given	Transfers to be received	Transfers to be given	Net wealth	Income	Con- sumption	Life- cycle wealth
Transfers received.	1.00							
Transfers given ....	0.19	1.00						
Transfers to be received.....	0.02	0.01	1.00					
Transfers to be given .....	0.24	0.06	0.19	1.00				
Net wealth .....	0.39	0.07	0.11	0.55	1.00			
Income .....	0.23	0.05	0.15	0.41	0.58	1.00		
Consumption .....	0.23	0.03	0.14	0.34	0.50	0.73	1.00	
Life cycle wealth ..	-0.72	0.01	0.06	0.16	0.34	0.20	0.13	1.00

Source: Our calculations based on data from the SHIW. Transfers include the capitalisation of interest.

Table 7

**Correlation coefficients among  
lifetime transfers, income, consumption and resources**

	Transfers received or to be received	Transfers given or to be given	Lifetime resources	Lifetime consumption	Lifetime income
Transfers received or to be received .....	1.00				
Transfers given or to be given .....	0.34	1.00			
Lifetime resources .....	0.31	0.26	1.00		
Lifetime consumption.....	0.28	0.16	1.00	1.00	
Lifetime income .....	0.10	0.20	0.98	0.98	1.00

Source: Our calculations based on data from the SHIW. Transfers include the capitalisation of interest.

These results, very similar to those obtained by Wolff (2002), cannot be interpreted as an equalising effect of transfers because people tend to react to transfers, changing their saving and consumption behaviour.<sup>12</sup>

Estimating life-cycle wealth as a function of transfers (received, to be received, given, to be given) and other explanatory variables, it turns out that households reduce

<sup>12</sup> In Italy the correlation between transfers received and life-cycle wealth is -0.72 (Table 6). In the US, according to Wolff's estimates, the correlation between transfers (WT) and current wealth holdings excluding transfers (NWX) varied over time from -0.30 in 1989 to -0.71 in 1992. In all four years the negative correlation between WT and NWX reduced (mechanically) overall wealth inequality. It is worth noting that, even if saving and consumption behaviour did not change in response to transfers, the equalising effect would not necessarily be intentional: it may be due to the random process of unintentional bequests. According to Gokhale and Kotlikoff (2002), in the US many, if not most, bequests appear to arise because the resources of the elderly are not fully annuitised; who receives inheritances is, in large part, a random process, which can, according to their model, equalise the distribution of wealth. On this issue see also De Nardi (2004) and Gokhale *et al.* (2001).

their life-cycle wealth less than the received transfers (with a coefficient close to -0.8 in the OLS estimate and to -0.48 in our preferred IV estimates in Table 8). Symmetrically, the coefficient of the given transfers is close to 1 in OLS and greater than 1 in 2SLS, suggesting that households increase their savings to compensate for the part of wealth transferred to offspring.

Table 8

### Effects of transfers on life-cycle wealth

Variable (1)	Parameter estimate	Standard error	t-value	Prob.
OLS (Adjusted R squared=0.43)				
Received transfers .....	-0.80338	0.02188	-36.73	<.0001
Transfers to be received .....	-0.15523	0.05896	-2.63	0.0085
Given transfers .....	0.90778	0.07293	12.45	<.0001
Transfers to be given .....	0.96351	0.02669	36.09	<.0001
2SLS (2) (Adjusted R squared=0.24)				
Received transfers .....	-0.83633	0.062893	-13.30	<.0001
Transfers to be received .....	-0.24773	0.141973	-1.74	0.0811
Given transfers .....	2.290186	1.055186	2.17	0.0300
Transfers to be given .....	1.196099	0.387602	3.09	0.0020
2SLS (3) (Adjusted R squared=0.07)				
Received transfers .....	-0.48650	0.175584	-2.77	0.0056
Transfers to be received .....	0.824985	0.676886	1.22	0.2230
Given transfers .....	1.711696	0.881536	1.94	0.0522
Transfers to be given .....	0.702330	0.285305	2.46	0.0139

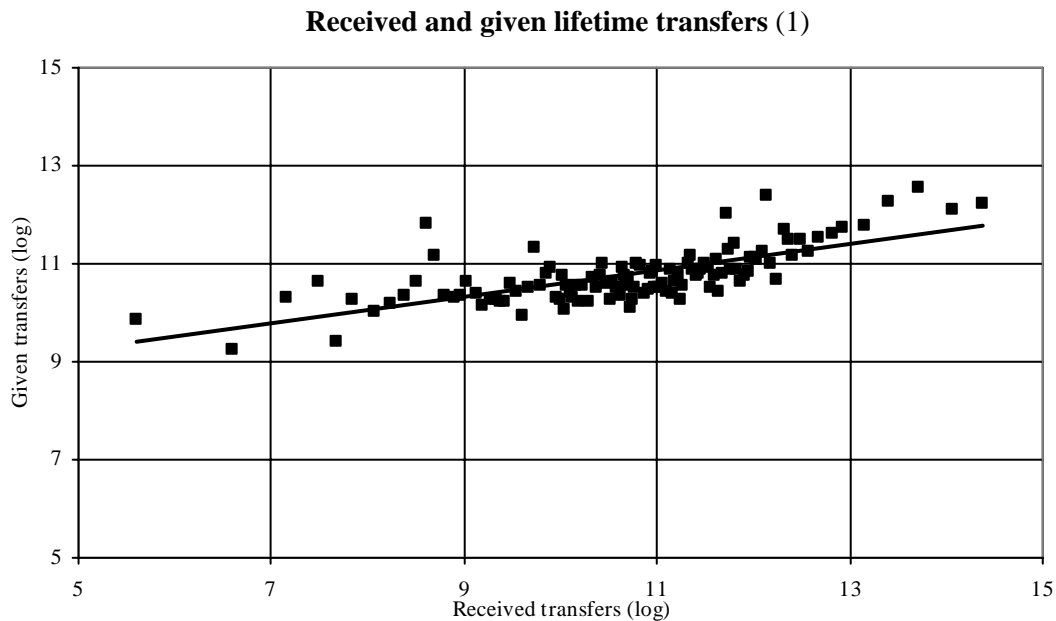
Dependent variable: ratio of life cycle wealth to household income. Other explanatory variables: intercept,  $1/(\text{household income})$ , geographical areas (2 dummies), municipality size (3 dummies), sex, age, age squared, household head's education (4 dummies), number of family members, number of income receivers, ratio of precautionary saving to income.

(1) Transfers include the capitalisation of interest and are divided by family income. (2) Transfers given and to be given are considered endogenous variables. Education, sector of activity and professional status of the household head's father are used as instrumental variables. (3) Transfers given and to be given are considered endogenous variables; transfers received and to be received are considered affected by measurement error. Therefore, all transfers are instrumented, resorting to education, sector of activity and professional status of the household head's father as instrumental variables.

Source: Our calculations based on data from the SHIW.



Figure 5



Source: Our calculations based on data from the SHIW. – (1) Transfers include the capitalisation of interest.

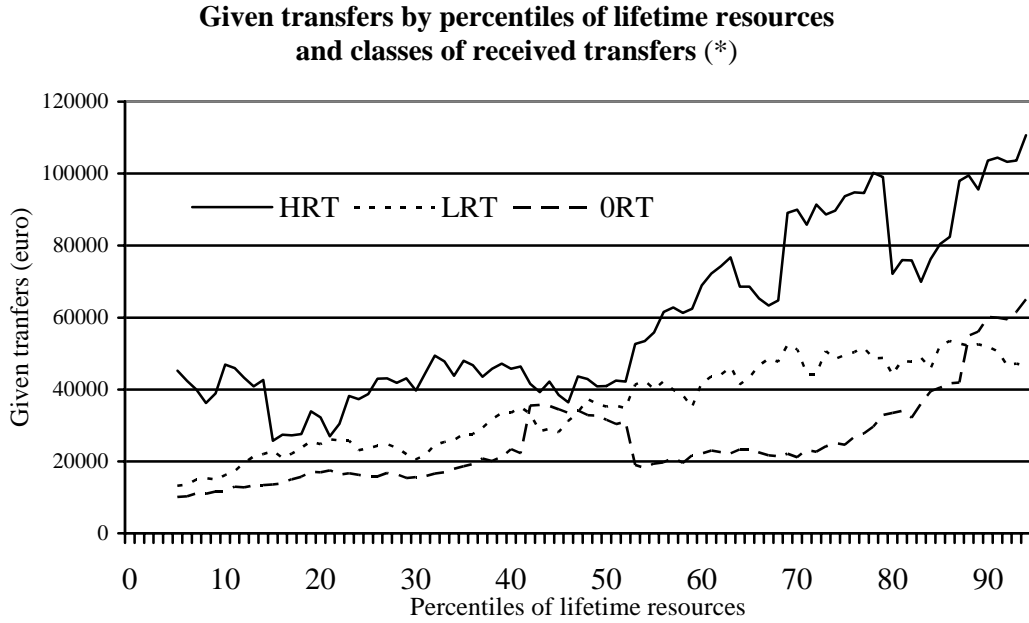
The transfers that households plan to leave to their descendants also present coefficients close to 1, suggesting that transfers to be given bring about higher saving. On the contrary, the transfers that households expect to receive have a small (and/or not significant) impact on saving, suggesting that households tend to adjust their saving behaviour only after they have received a transfer and not before; this result is very similar to that obtained by Brown and Weisbenner (2002).

In a lifetime perspective, the correlation between received and given transfers is positive (the correlation coefficient is equal to 0.33); it remains approximately the same when controlling for lifetime income (the partial correlation coefficient is equal to 0.32).

A positive relationship between planned bequests and received inheritance holds up even after controlling for lifetime resources. Figure 6 shows the amount of lifetime transfers that households have given or planned to give to their offspring by percentiles of lifetime resources and three classes of received (or expected to receive) transfers (zero, greater than zero and lower than the median, greater than the median). The figure suggests that the stronger intent to bequeath among inheritors is not merely a manifestation of wealth. Similar results obtain looking at the percentage of households who expect to leave a greater-than-the-median bequest (Figure 7). These results are very similar to those of Cox and Stark (2005), who find a large, significant, and robust effect of (received) inheritances on intended bequests, probably due to the importance of family traditions.

The increase in given transfers is less than proportional to the increase in received transfers (Figure 5). The ratio of given to received transfers is greater when received transfers are small and lower when transfers are large.

Figure 6

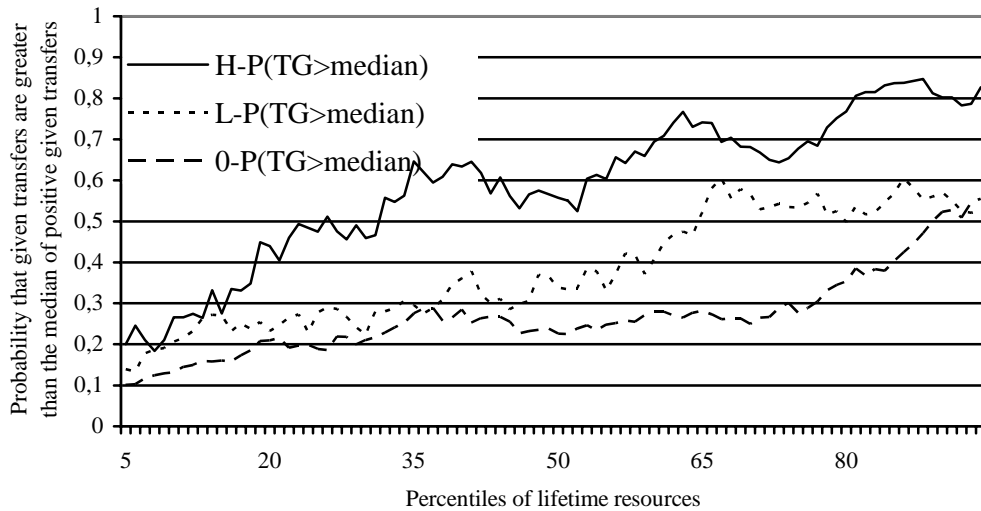


(\*) Transfers include the capitalisation of interest. HRT= Received transfers greater than the median; LRT = Received transfers greater than zero and lower than the median; ORT = Received transfers equal to zero.

Source: Our calculations based on data from the SHIW.

Figure 7

**Probability that given transfers are greater than the median of positive given transfers, by percentiles of lifetime resources and classes of received transfers (\*)**



(\*) Transfers include the capitalisation of interest. H-P(TG>median) = Received transfers greater than the median; L-P(TG>median) = Received transfers greater than zero and lower than the median; 0-P(TG>median) = Received transfers equal to zero.

Source: Our calculations based on data from the SHIW.

The correlation between transfers (received or expected over the whole life span) and lifetime income is positive. Richer households do receive greater inheritances and other wealth transfers than poorer households (Table A4). However, as a proportion of their lifetime income, transfers are greater for poorer households than richer ones. A similar result obtains for transfers to be left to future generations: richer households give to their siblings greater transfers than poorer households, but as a proportion of the resources, transfers are greater for poorer donors. Again, these results do not imply an equalising impact of transfers on lifetime resources.

In fact, these results could be due to several factors.

- 1) Households receiving transfers may make less effort to produce income; in this case there would be a negative correlation between received transfers and income; the decrease in inequality of lifetime resources would be attributable to the change in the behaviour of recipients.
- 2) Parents may plan the amount of transfers to bequeath on the basis of children earning ability; thus low-income children could receive more transfers than high-income children. In addition, parents may decide to leave financial transfers to children with fewer abilities, while investing in the education of children with greater potential. In both cases the ratio of received transfers to income will decrease as children's income increases. The decrease in inequality would be intentionally due to the behaviour of parents.
- 3) Richer parents may invest more than poorer parents in children's education and provide their offspring with greater earning opportunity; for these children the ratio of received transfers to income will be low because they will have a greater probability of getting well paid jobs.
- 4) The decrease in inequality of lifetime resources could be due to the random process of unintentional bequests.

We do not find a significant effect of received transfers on income. When estimating (log) of household head's and spouse's current income from labour or pensions as a function of (received and expected) transfers and other household characteristics, the coefficient of transfers is negative (as expected) but not significant; results do not change when transfers are interacted with the dummy spouse, or when we consider only greater-than-median transfers and their interaction with the dummy spouse (Table 9).

Similar results obtain when estimating lifetime income as a function of (received and given over the life span) transfers and other control variables (age, age squared, sex, education, geographical area, dummy married, number of income earners and parents' occupation). The coefficient reporting the effect of received transfers on income is negative and not significantly different from zero; the coefficient of given transfers is positive and significantly different from zero. Given transfers, however, cannot be considered an exogenous variable as they depend on lifetime resources. Resorting to IV estimators (using education and sector of activity of household head's father and number of children as instruments) the coefficients of both transfers turn out to be highly non-significant (these results are not reported). In other words, while received transfers lead to an increase in consumption and given transfers to a decrease in consumption, their

influence on income turns out to be small.<sup>13</sup>

Table 9

**The effects of transfers on family income**

Variable (1)	Parameter estimate	Standard error	t-value	Prob.
Transfers (received and expected)....	-7,34733E-9	2,094389E-8	-0,35	0,7258
Transfers (received and expected)* dummy spouse .....	-4,0734E-10	3,041089E-8	-0,01	0,9893
Transfers (received and expected) greater than the median .....	-5,91843E-9	2,084285E-8	-0,28	0,7765
Transfers (received and expected) [greater than the median]*dummy spouse.....	6,01977E-10	3,018176E-8	0,02	0,9841

Dependent variable: log of household head's and spouse's income from labour or pensions. Other explanatory variables: intercept, municipality size (3 dummies), geographical area (2 dummies), sex, age, age squared, education (4 dummies), father's education (5 dummies), spouse (1 dummy). Adjusted R squared=0.41; RMSE=0.525; Dependent mean=9.62.

Source: Our calculations based on data from the SHIW. (1) Transfers include the capitalisation of interest.

The measurement of the importance of the role of the other factors is beyond the aim of this paper; some consideration, however, seem proper. Type 2 factors tend to increase the resources of worse-off households; to some extent this kind of bequest can therefore be equalising. Type 3 factors tend to hide the importance of the mechanisms of transmission of inequality, when looking at financial transfers only. In fact, financial transfers are just one of the channels of transmission of inequality and probably not the most important. Parents transfer not only wealth, but also education, ability and opportunities; these factors influence lifetime resources more than bequests and inter vivos transfers.<sup>14</sup>

Lifetime received transfers account for 8.6 per cent of the variance of lifetime resources; received transfers and family background variables (i.e. father's education dummies) account for 21.6 per cent of the variance. With the increase in the education of parents, the increase in lifetime resources of children is much greater (in absolute terms) than the increase in received transfers (Table 5). Family background variables play a much more important role than bequests as a factor of transmission of inequality of

<sup>13</sup> The small effect of inheritance on income seems to be consistent with previous studies examining the effect of inheritance on labour supply. Joulfaian and Wilhelm (1994) find that inheritance does not lead to a large reduction in the labour supply of men and married women; Holtz-Eakin, Joulfaian and Rosen (1993) find small reductions in the labour supply of inheritors who remain in the labour force (but the likelihood that a person decreases his or her participation in the labour force increases with the size of the inheritance received). Looking at old-age support in developing countries, Cameron and Cobb-Clark (2001) find little evidence that transfers are a substitute for the income support provided by the elderly parent's own labour supply. The findings of Brown, Coile and Weisbenner (2006), however, contrast with those of the previous literature, which failed to find large and consistent effects of inheritance receipt on retirement; in addition, they find that the effect on retirement is larger when the inheritance is unexpected.

<sup>14</sup> See, for instance, Bowles and Gintis (2002). Gokhale and Kotlikoff (2002, p. 269) argue that "While bequests are important, the main determinant of wealth inequality, according to our model, is earning inequality".

lifetime resources. In other words, the main determinant of inequality of lifetime resources is earning inequality, significantly influenced by family background variables. Intergenerational (financial) transfers play a more limited role in generating inequality of lifetime resources; in some circumstances, intergenerational (financial) transfers can also reduce the inequality of resources (for instance, when they are unintentional and follow a random process<sup>15</sup> or when they are made to children with relatively low earnings, or poor saving discipline<sup>16</sup>).

## 6. Concluding remarks

In this paper we have examined the role of intergenerational transfers in the wealth accumulation of Italian households. The traditional measures employed in Section 3 show that received transfers represent an important share of the net wealth held by households. Direct estimates referring to 2002 range from 30 to 55 per cent, depending on the inclusion of the income stream produced by transferred assets. This share has shown a tendency to increase over the last decade.

In a lifetime perspective, the ratio of transfers received over the whole life span to the total amount of resources, both computed at the age of 15, is on average equal to 4.6 per cent, a significant share considering the size of the denominator. Computed on the recipients, the same ratio is 9.4 per cent. The lifetime perspective allows a deeper analysis of the age profile of inheritance; while received transfers at the observed age appears positively correlated with age, in particular when the return on capital is taken into account, the amount of inheritance received over the life span is much flatter. Looking at intergenerational transfers received (or given) until a given age can lead to an overestimation of the role of transfers as a factor of inequality. Transfers, however, are very concentrated, more than income and wealth, even when considered in a lifetime perspective.

Households receiving transfers show higher levels of lifetime income, consumption, net wealth and given transfers than non-recipient households. Richer households receive larger transfers but, as a proportion of their current wealth holdings, transfers are greater for poorer households than richer ones. These results cannot be interpreted as an equalising effect of transfers, because people tend to react to transfers, changing their saving and consumption behaviour.

The correlation between transfers (received or expected over the whole life span) and lifetime income is positive. Again, richer households receive greater inheritances and other wealth transfers than poorer households; as a proportion of their lifetime income, transfers are greater for poorer households than richer ones. This result is likely to be due to the much more important role played by family background variables than bequests as factors of transmission of inequality of lifetime resources.

Finally, we find a positive relationship between left-to-children bequests and received-from-parents inheritances; this relationship holds even after controlling for lifetime resources, suggesting the importance of the role of family traditions.

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<sup>15</sup> See, for instance, De Nardi (2004) and Gokhale *et al.* (2001).

<sup>16</sup> See, for instance, Gokhale and Kotlikoff (2002).

**APPENDIX A**  
**STATISTICAL TABLES**

Table A1

**Intergenerational transfers by age of household head**  
*(percentages of households, euros)*

Age (years)	Share of households that have received transfers	Share of households that have given transfers	Share of households that expect to receive transfers	Share of households that expect to give transfers
up to 30 .....	17.9	0.0	27.7	51.9
31-40 .....	28.7	0.4	26.7	59.0
41-50 .....	33.1	0.3	19.2	60.6
51-60 .....	43.5	3.1	11.3	64.5
61-70 .....	36.1	5.6	3.7	58.1
over 71 .....	31.2	9.0	1.0	53.0
Total .....	33.8	3.6	12.6	58.6
	average amounts			
	Received	Given	To be received	To be given
up to 30 .....	14,923	0	27,071	61,480
31-40 .....	36,236	192	36,134	110,040
41-50 .....	49,958	71	29,231	135,971
51-60 .....	77,824	1,489	11,875	184,724
61-70 .....	80,141	5,708	4,128	135,897
over 71 .....	66,479	10,041	280	98,480
Total .....	60,422	3,522	16,262	129,436
	average amounts (capitalised or discounted)			
	Received	Given	To be received	To be given
up to 30 .....	16,999	0	17,240	21,027
31-40 .....	43,679	201	26,206	46,059
41-50 .....	70,572	85	22,937	67,120
51-60 .....	115,368	1,629	10,186	108,330
61-70 .....	138,966	7,340	3,617	93,846
over 71 .....	136,350	13,965	261	80,424
Total .....	98,706	4,690	12,459	77,012
	average amounts (discounted at 15 years)			
	Received	Given	To be received	To be given
up to 30 .....	13,359	0	13,819	16,978
31-40 .....	28,656	128	17,530	30,163
41-50 .....	38,896	44	12,916	36,958
51-60 .....	52,335	723	4,684	49,402
61-70 .....	52,160	2,760	1,421	35,279
over 71 .....	38,161	3,848	84	23,746
Total .....	40,855	1,497	7,347	34,135

Source: Our calculations based on data from the 2002 SHIW.

Table A2

**Wealth and transfers by age of household head**  
(euros, percentages)

Age (years)	Life-cycle wealth	Future net dissaving	Net wealth	Ratio of life-cycle wealth to net wealth	Ratio of future net dissaving to net wealth
up to 30 .....	52,478	65,690	69,477	75,5	94,5
31-40 .....	91,031	114,655	134,509	67,7	85,2
41-50 .....	102,506	128,810	172,993	59,3	74,5
51-60 .....	132,315	147,909	246,054	53,8	60,1
61-70 .....	77,002	118,400	208,628	36,9	56,8
over 71.....	38,604	80,827	160,989	24,0	50,2
Total .....	85,632	115,095	179,649	47,7	64,1

Source: Our calculations based on data from the 2002 SHIW. Transfers include the capitalisation of interest.

Table A3

**Lifetime resources, consumption, income and transfers by age of household head**  
(values discounted at the age of 15 years, euros)

Age (years)	Lifetime received transfers (1) (a)	Lifetime given transfers (1) (b)	Lifetime income (2) (c)	Lifetime resources (a) + (c)	Lifetime consumption (a)+(c)-(b)
up to 30 .....	27,178	16,978	1,518,864	1,546,041	1,529,063
31-40 .....	46,186	30,291	1,518,259	1,564,445	1,534,154
41-50 .....	51,812	37,002	1,324,082	1,375,894	1,338,892
51-60 .....	57,019	50,126	996,785	1,053,804	1,003,678
61-70 .....	53,581	38,040	665,493	719,074	681,034
over 71.....	38,245	27,594	446,902	485,147	457,553
Total .....	48,202	35,633	995,848	1,044,050	1,008,417

(1) With capitalisation of interest. (2) Autocorrelation coefficient of residuals = 0.9; adjusted for productivity growth.

Source: Our calculations based on data from the 2002 SHIW.

Table A4

**Lifetime resources, consumption, income and transfers (1)**  
(average values, discounted at 15 years old; euros and percentages)

Tenths of households by lifetime resources	Lifetime resources	Lifetime consumption	Lifetime income (2)	Lifetime received transfers	Lifetime given transfers	Ratio of lifetime income to lifetime resources	Ratio of lifetime transfers received to lifetime resources	Ratio of lifetime transfers given to lifetime resources
1	238,663	228,210	233,067	5,595	10,453	97.7	2.3	4.4
2	360,855	344,757	348,923	11,932	16,097	96.7	3.3	4.5
3	485,506	464,918	468,387	17,119	20,588	96.5	3.5	4.2
4	629,637	605,427	601,582	28,055	24,210	95.5	4.5	3.8
5	765,142	735,907	743,122	22,020	29,235	97.1	2.9	3.8
6	926,384	892,410	889,762	36,622	33,974	96.0	4.0	3.7
7	1,124,531	1,083,812	1,083,689	40,842	40,719	96.4	3.6	3.6
8	1,385,889	1,336,344	1,327,063	58,826	49,545	95.8	4.2	3.6
9	1,798,367	1,742,984	1,708,662	89,706	55,384	95.0	5.0	3.1
10	2,732,596	2,656,275	2,560,818	171,777	76,320	93.7	6.3	2.8
Total .....	1,044,050	1,008,417	995,848	48,202	35,633	95.4	4.6	3.4
Tenths of households by lifetime consumption	Lifetime resources	Lifetime consumption	Lifetime income (2)	Lifetime received transfers	Lifetime given transfers	Ratio of lifetime income to lifetime consumption	Ratio of lifetime transfers received to lifetime consumption	Ratio of lifetime transfers given to lifetime consumption
1	253,254	220,246	244,081	9,172	33,007	110.8	4.2	15.0
2	359,160	340,998	345,376	13,784	18,162	101.3	4.0	5.3
3	482,588	463,361	465,344	17,244	19,227	100.4	3.7	4.1
4	627,878	601,875	604,920	22,958	26,003	100.5	3.8	4.3
5	763,240	739,162	736,974	26,266	24,078	99.7	3.6	3.3
6	928,350	891,931	882,844	45,506	36,419	99.0	5.1	4.1
7	1,123,324	1,083,818	1,083,643	39,681	39,506	100.0	3.7	3.6
8	1,386,150	1,345,624	1,334,552	51,599	40,527	99.2	3.8	3.0
9	1,797,681	1,737,021	1,687,848	109,834	60,660	97.2	6.3	3.5
10	2,725,236	2,666,392	2,578,733	146,504	58,844	96.7	5.5	2.2
Total .....	1,044,050	1,008,417	995,848	48,202	35,633	98.8	4.8	3.5
Tenths of households by lifetime income	Lifetime resources	Lifetime consumption	Lifetime income (2)	Lifetime received transfers	Lifetime given transfers	Ratio of lifetime income to lifetime resources	Ratio of lifetime transfers received to lifetime income	Ratio of lifetime transfers given to lifetime income
1	258,356	242,586	229,625	28,730	15,770	88.9	12.5	6.9
2	364,680	347,254	340,943	23,737	17,426	93.5	7.0	5.1
3	497,014	474,384	462,208	34,806	22,631	93.0	7.5	4.9
4	650,522	626,033	603,041	47,481	24,488	92.7	7.9	4.1
5	779,979	744,095	729,368	50,610	35,884	93.5	6.9	4.9
6	939,560	902,117	880,028	59,531	37,442	93.7	6.8	4.3
7	1,112,481	1,073,667	1,068,468	44,013	38,814	96.0	4.1	3.6
8	1,380,374	1,332,965	1,323,046	57,328	47,409	95.8	4.3	3.6
9	1,755,853	1,705,857	1,708,829	47,024	49,996	97.3	2.8	2.9
10	2,710,284	2,643,689	2,621,419	88,865	66,595	96.7	3.4	2.5
Total .....	1,044,050	1,008,417	995,848	48,202	35,633	95.4	4.8	3.6

(1) Transfers include the capitalisation of interest. (2) Lifetime income is adjusted for productivity growth; autocorrelation coefficient of residuals = 0.9.

Source: Our calculations based on data from the 2002 SHIW.



Table A5

**Wealth and transfers (1)**  
(average values; euros and percentages)

Tenths of households by net wealth	Wealth	Lifecycle wealth	Future dissaving	Received transfers	Given transfers	Transfers to be received	Transfers to be given	Ratio of received transfers to net wealth	Ratio of given transfers to net wealth	Ratio of transfers to be received to net wealth	Ratio of transfers to be given to net wealth
1	-1,016	-396	-3,732	1,654	2,274	6,884	9,600	-162.8	-223.8	-677.6	-944.9
2	5,033	5,944	2,239	3,266	4,177	7,453	10,247	64.9	83.0	148.1	203.6
3	20,441	2,736	9,797	23,991	6,286	6,618	17,262	117.4	30.8	32.4	84.4
4	55,760	11,309	33,413	45,290	838	7,869	30,216	81.2	1.5	14.1	54.2
5	89,643	46,322	54,795	44,300	979	4,180	39,028	49.4	1.1	4.7	43.5
6	120,100	65,053	70,199	56,207	1,161	7,958	57,858	46.8	1.0	6.6	48.2
7	162,171	71,126	100,617	94,424	3,379	9,703	71,257	58.2	2.1	6.0	43.9
8	218,245	134,656	137,088	86,076	2,487	16,122	97,278	39.4	1.1	7.4	44.6
9	314,428	165,555	205,228	151,412	2,539	20,670	129,870	48.2	0.8	6.6	41.3
10	813,789	355,134	542,806	481,562	22,907	37,261	308,244	59.2	2.8	4.6	37.9
Total ....	179,649	85,632	115,095	98,706	4,690	12,459	77,012	54.9	2.6	6.9	42.9
Tenths of households by lifecycle wealth	Wealth	Lifecycle wealth	Future dissaving	Received transfers	Given transfers	Transfers to be received	Transfers to be given	Ratio of received transfers to lifecycle wealth	Ratio of given transfers to lifecycle wealth	Ratio of transfers to be received to lifecycle wealth	Ratio of transfers to be given to lifecycle wealth
1	236,845	-420,401	138,911	666,057	8,810	8,765	106,699	-158.4	-2.1	-2.1	-25.4
2	30,743	-6,460	17,486	37,620	417	6,965	20,222	-582.4	-6.5	-107.8	-313.0
3	13,446	2,679	6,888	10,855	88	4,544	11,102	405.2	3.3	169.6	414.4
4	27,873	11,966	15,589	15,977	71	7,764	20,048	133.5	0.6	64.9	167.5
5	72,138	43,406	41,216	29,429	697	4,897	35,818	67.8	1.6	11.3	82.5
6	104,025	81,578	68,526	23,397	950	11,876	47,375	28.7	1.2	14.6	58.1
7	138,041	116,798	79,220	22,839	1,596	8,081	66,901	19.6	1.4	6.9	57.3
8	189,582	168,617	124,580	23,097	2,132	11,694	76,695	13.7	1.3	6.9	45.5
9	282,624	249,780	176,204	43,763	10,919	26,733	133,153	17.5	4.4	10.7	53.3
10	700,789	611,295	482,212	110,737	21,243	33,046	251,623	18.1	3.5	5.4	41.2
Total ....	179,649	85,632	115,095	98,706	4,690	12,459	77,012	115.3	5.5	14.5	89.9
Tenths of households by future dissaving	Wealth	Lifecycle wealth	Future dissaving	Received transfers	Given transfers	Transfers to be received	Transfers to be given	Ratio of received transfers to future dissaving	Ratio of given transfers to future dissaving	Ratio of transfers to be received to future dissaving	Ratio of transfers to be given to future dissaving
1	43,642	17,898	-60,855	28,811	3,068	1,921	106,417	-47.3	-5.0	-3.2	-174.9
2	11,080	2,127	49	12,245	3,292	114	11,145	...	...	...	...
3	29,872	17,484	8,048	15,719	3,331	805	22,628	195.3	41.4	10.0	281.2
4	65,973	-8,996	22,240	79,687	4,718	3,425	47,158	358.3	21.2	15.4	212.0
5	94,475	35,260	43,073	61,699	2,483	5,084	56,487	143.2	5.8	11.8	131.1
6	116,448	74,296	68,299	45,524	3,371	7,143	55,293	66.7	4.9	10.5	81.0
7	174,559	104,320	99,947	72,693	2,454	8,952	83,563	72.7	2.5	9.0	83.6
8	220,356	96,884	144,460	124,797	1,325	10,750	86,645	86.4	0.9	7.4	60.0
9	289,275	148,484	214,634	151,980	11,189	23,060	97,701	70.8	5.2	10.7	45.5
10	754,438	370,465	614,023	395,638	11,664	63,616	204,032	64.4	1.9	10.4	33.2
Total ....	179,649	85,632	115,095	98,706	4,690	12,459	77,012	85.8	4.1	10.8	66.9

Source: Our calculations based on data from the 2002 SHIW. (1) Transfers include the capitalisation of interest.

## APPENDIX B

## SECTION EXTRACTED FROM 2002 SHIW QUESTIONNAIRE

## INTERGENERATIONAL TRANSFERS – 2nd ROUND

HEAD OF HOUSEHOLD'S YEAR OF BIRTH IS ODD |\_\_|\_\_|\_\_|\_\_|

1. Have you (and your spouse) ever received a bequest or a gift or valuable presents?  
 - Yes..... 1  
 - No..... 2 → **Quest. 3**
2. Think of all the transfers of assets that you (or your spouse/cohabitant) have received as a bequest or gift and answer the following questions:

Bequest	Gift	To the head of household or his/her spouse/cohabitant		From parents (or grandparents) or other persons?		Year of the transfer	Value of the transfer in the year it was made €	or Value of the transfer €	in ..... (year)
		HH 1	SP 2	PA-GR 1	OTHER 2				
1	2	HH 1	SP 2	PA-GR 1	OTHER 2	_ _ _ _	_ . _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	PA-GR 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	PA-GR 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	PA-GR 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	PA-GR 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _

3. Have you (or your spouse/cohabitant) ever given or bequeathed large sums of money, houses, securities or other assets to your children, grandchildren or other persons?  
 - Yes..... 1  
 - No..... 2 → **Quest. 5**
4. Think of all the transfers of assets that you (or your spouse/cohabitant) have made and answer the following questions:

Bequest	Gift	By the head of household or his/her spouse/cohabitant		To children (or grandchildren) or other persons?		Year of transfer	Value of the transfer in the year it was made €	or Value of the transfer €	in ..... (year)
		HH 1	SP 2	CH-GC 1	OTHER 2				
1	2	HH 1	SP 2	CH-GC 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	CH-GC 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	CH-GC 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	CH-GC 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _
1	2	HH 1	SP 2	CH-GC 1	OTHER 2	_ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _ _ _ _ _  →	_ _ _ _

5. Do you (or your spouse/cohabitant) expect to receive bequests, gifts or other valuable presents in the future?

- Yes..... 1  
 - No..... 2 → **Quest. 7**

6. Can you specify, in particular, whether you (or your spouse/cohabitant) expect to receive something from your parents or grandparents or other persons? If yes, please give an estimate of the present value of the assets you expect to receive. (**Read the cases and enter codes and values where expected**)

To the head of household or spouse/cohabitant		From parents (or grandparents) or other persons		Present value €
HEAD OF HOUSEHOLD 1	SPOUSE/COHABITANT 2	PARENTS/ GRANDPARENTS 1	OTHER PERSONS 2	_ _ .  _ _ _ _ .  _ _ _ _
HEAD OF HOUSEHOLD 1	SPOUSE/COHABITANT 2	PARENTS/ GRANDPARENTS 1	OTHER PERSONS 2	_ _ .  _ _ _ _ .  _ _ _ _
HEAD OF HOUSEHOLD 1	SPOUSE/COHABITANT 2	PARENTS/ GRANDPARENTS 1	OTHER PERSONS 2	_ _ .  _ _ _ _ .  _ _ _ _
HEAD OF HOUSEHOLD 1	SPOUSE/COHABITANT 2	PARENTS/ GRANDPARENTS 1	OTHER PERSONS 2	_ _ .  _ _ _ _ .  _ _ _ _

7. (**If aged less than 50**) Do you think you will have (other) children? (**If yes**) How many?

- Yes..... 1 → **How many (more) |\_|\_|**  
 - No..... 2  
 - Don't know ..... 3

8. Considering both gifts and bequests, do you (or your spouse/cohabitant) expect to leave some form of wealth (financial assets, dwellings, etc.) to your existing or future children, grandchildren or other heirs?

- Yes..... 1  
 - No..... 2 → **Section F**  
 - Don't know ..... 3 → **Section F**

(**SHOW CARD 9 2^ ROUND**)

9. (**If yes**) At today's prices, what do you think could be the total value of your bequests, gifts and other valuable presents to these persons; i.e. how much will you transmit in total to your children and how much to other persons?

To		Present value €
CHILDREN/GRANDCHILDREN (existing and future) 1	OTHER PERSONS 2	_ _ .  _ _ _ _ .  _ _ _ _
CHILDREN/GRANDCHILDREN (existing and future) 1	OTHER PERSONS 2	_ _ .  _ _ _ _ .  _ _ _ _

End of 2nd ROUND

→ **Go to Section F**



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## DISCUSSION OF THE PAPER BY L. CANNARI AND G. D'ALESSIO

*Dimitris Christelis\**

### 1. Introduction

In this paper the authors investigate the role of financial transfers (given and received, including bequests) in household asset accumulation. According to the life cycle theory of consumption, households save when young and dissave when old. Part of their asset accumulation, however, derives from inherited wealth and financial transfers. It is therefore important to understand how much of total wealth is due to life cycle saving, and how much is due to transfers and bequests received.

Kotlikoff and Summers (1981) claim that for US households 50-80 per cent of asset accumulation is the result of transfers and inherited wealth. According to Modigliani (1988) this share is closer to 15-25 per cent. The crucial difference between the two approaches is the treatment of income from transfers and bequests received. Kotlikoff and Summers assume that it is saved in its entirety while Modigliani assumes that none of it is saved. Ultimately this is a quantitative question, and conclusions can be very sensitive to assumptions about theory and data and to definitions of magnitudes of interest.

### 2. The data and a summary of the authors' results

The authors use two special modules from 1991 and 2002 of the Survey on Household Income and Wealth (SHIW), conducted by the Bank of Italy. In those modules households are asked about past transfers and bequests given and received (including the year of the transaction), as well as prospective ones (only in 2002).

One of the main findings in the paper is that financial transfers are highly concentrated among the more affluent, although their effect on wealth inequality is ambiguous. Using a retrospective calculation, the authors find that capitalized transfers and bequests account for between 30 and 55 per cent of current wealth, which is an estimate that lies in the middle of the range between the findings of Kotlikoff and Summers on the one hand, and Modigliani on the other. They then undertake a prospective exercise by calculating the present value of lifetime income and transfers at age 15 and they find that transfers received are a higher proportion of lifetime resources for richer households, leading to an increase in lifetime inequality. Finally the authors try to associate transfers given and received with several wealth measures.

### 3. Comments

This paper takes a thorough and detailed look at a difficult but very important issue, using data that are not easy to interpret. The authors' careful handling and interpretation of the data is evident throughout the paper.

I would like to begin by making two simple points. First, it is difficult to talk about age effects using cross-sectional data, since this would require assumptions about the absence of cohort effects. This is very unlikely for amounts and debatable for ratios. So I

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think the authors should refrain from interpreting the differences of these magnitudes among people of different ages as evidence of age patterns.

Second, it is advisable that medians be used in preference to means in analyses using micro-level data. In the case of amounts, medians are clearly preferable when the distribution of the variable of interest is skewed since they give a better idea of its location, while when the distribution is symmetric, the results are roughly the same. We also know that for economic variables, distributions are almost invariably skewed. In the case of ratios, one should look at the median ratio, and not the ratio of sums (which is equal to the ratio of means), even within classes of households (e.g. income class, region). To give an example from the Survey of Health, Ageing and Retirement in Europe (SHARE), we present in Table 1 the means and medians of financial transfers given (conditional on their being positive) and of the ratio of net worth to gross income for Italy.

Table 1

**Means vs medians**

	Median	Mean	Ratio of sums (means)
Financial transfers given (conditional)	1,500	6,660	--
Net worth to gross income ratio	5.77	62.74	12.03

Source: SHARE 2004 data for Italy.

One can readily see how different the results for amounts can be when one chooses to look at medians instead of means, and the difference can be even greater for ratios. The large difference in the wealth to income ratio derives from the fact that income is much less skewed than wealth, and thus the representative household is at a higher income quantile than wealth quantile. This makes its wealth to income ratio small, while this point is completely submerged when one first sums up wealth and income and then divides them, since wealth has typically many more very high outliers that affect the total sum more than those for income. The result is a very misleading picture of the wealth to income ratio of the representative household.

To sum up, ratios of sums (means) can be useful if one is interested in a ratio at a more aggregate level (e.g. country, age class), but not when one is interested in the representative household within this aggregate, as the authors presumably are. It is even better to look at different parts of the distribution of amounts or ratios (25th, 75th quantiles) instead of at a single number.

It appears that there is a problem with the prevalence of transfers given, as highlighted in Table 2, which compares SHIW and SHARE. It is clear that there are significant discrepancies between the two surveys, most obviously between the prevalence of financial transfers given by the older age groups and that of transfers received by the younger groups within SHIW. This difference might be due to the fact that those who give transfers seem to have in mind a different concept of financial transfers than those who receive them (perhaps givers only consider larger sums). A possible solution is to have households report transfers only above a certain threshold (in SHARE it is equal to 250 euro), or to help households remember transfers given by citing motives for them (health shocks, marriage, acquisition of durables).



Table 2

**Prevalence of financial transfers**

Transfers received (SHIW)		Transfers given (SHIW and SHARE)		
Age group	Prevalence	Age group	Prevalence	
			SHIW	SHARE
21-30	0.18	51-60	0.03	0.38
31-40	0.29	61-70	0.06	0.36
41-50	0.33	71+	0.09	0.17

Source: Authors' calculations based on SHIW 2004 and SHARE 2004 data for Italy.

The authors carry out various retrospective and prospective projections of income and consumption flows, and one would like to have some robustness checks done to assess the reliability of those estimates. In the case of income, predictions from younger cohorts could be compared with the actual values of older cohorts sampled later in time, or retrospective predictions from older cohorts could be compared with the actual values of younger cohorts sampled earlier in time. Regarding income there is a further selectivity problem, since one would need the unconditional prediction and not the conditional one, that is one would have to multiply the predicted income value by the probability of receiving it (typically the probability of being employed or – in the case of pensions – retired). Analogous robustness checks should be performed for consumption (although there is no selectivity issue in this case) and financial transfers when a new transfer module is implemented in the future.

I think that it would be a good idea to treat capital gains in a more explicit fashion. For past transfers, capital gains are incorporated when transfers are given/received, but what happens between that time and the time of the survey? For prospective transfers given, capital gains accumulate from now (or from age 15 in the authors' calculations) until the time of disposition. They accrue on income earned and on assets and thus add to lifetime resources. For prospective transfers received, capital gains accrue from the time of receipt to death and they also represent income. It must be said, however, that the effect of inclusion of capital gains on the share of transfers in lifetime resources is not clear a priori.

The authors might also consider taking another look at the treatment of consumption. Currently consumption is treated as a residual, both for retrospective and prospective calculations. This means that all measurement errors are accumulated in consumption. As a robustness check the authors could try to predict consumption, just as they do income, in both calculations and see if the resources and their uses are roughly balanced.

An even better check would be the use of a microsimulation model, which would entail starting with a household survey in a given year and estimating (using structural or reduced-form models) some important decision rules (e.g. consumption, labour supply, transfer giving, portfolio choices) and characteristics (level of education, household formation, childbearing); then letting the economy evolve year by year with

person/household choices being determined by the decision rules and random draws of the disturbances of the model(s). This approach would have many advantages:

- It would lead a complete account of predicted transfers given and received each year, which could be checked against actual data.
- There would be no need to guess about the future path of characteristics that determine choices, e.g. labour supply, marital status, number of children, since those characteristics would be observed each year.
- It would accommodate differential saving out of income and transfers received, and also by asset (e.g. housing). This would enable the Kotlikoff-Summers assumptions to be compared with those of Modigliani.
- The effects of any demographic transition (e.g. a decline in the number of transfer recipients) could be readily incorporated
- The importance of cohort and time effects could be assessed by shocking the system at the cohort-level each year and observing the differences in outcomes.
- The analysis could be repeated a number of times – enabling the generation of the distributions of the outcomes of interest (also of joint distributions) and the computation of standard errors.
- Results could be compiled for any population group of interest as defined by a combination of household characteristics.

Obviously, a microsimulation model is a very large and time-consuming project and accordingly the aforementioned exercises and checks could only be incorporated at a later stage in the authors' research project.

Turning to the regressions performed towards the end of the paper, it would be useful to see the auxiliary regression for the instrumental variables to give a sense of the validity of instruments used. For the regression of lifetime income on transfers and characteristics, instruments could be problematic: education, the sector of activity of the household head could be correlated with unobservables of lifetime income of his child (e.g. self-employed workers).

#### **4. Conclusions**

The authors' study is a very thorough and detailed exercise, involving painstaking data work and reaching sensible conclusions. Their forward-looking lifetime analysis is especially useful and illuminating. I think that there is a need for some robustness checks and validation exercises to assess the reliability of the results. I further believe it would be worthwhile taking a second look at how financial transfers given are perceived by the SHIW respondents. However, there is no doubt that with this paper the authors have advanced to a considerable degree our understanding of the role of financial transfers in the lifetime resources of Italian households.

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# CAPITAL GAINS AND WEALTH DISTRIBUTION IN ITALY

*Luigi Cannari\**, *Giovanni D'Alessio\** and *Romina Gambacorta\**

## 1. Introduction

In the last fifteen years, asset prices have undergone sizeable changes. Between 1987 and 1992, the prices of houses rose by about 80 per cent in real terms, decreasing by more than 20 per cent in the following five years, and quickly increasing again thereafter. Stock prices rose until 2000, only to fall by more than 40 per cent in the following two years and then increase yearly by about 15 per cent between 2003 and 2005.

This paper tries to assess the impact of these price variations on the amount of wealth held by Italian households. We focus on the specific role played by capital gains, i.e. wealth variations solely determined by changes in asset prices. Examining capital gains is important in many respects: they directly affect wealth distribution based on their size and dispersion, and they also have an impact on household consumption, labour supply and mobility.<sup>1</sup>

In order to explain how capital gains may affect wealth distribution let us consider three families, endowed at the end of the 1980s with the same amount of wealth in cash and the same conditions of access to financial markets. The first family buys the most profitable asset at the beginning of the year, the second one buys the less profitable one, and the third buys a fifty-fifty combination of the two. After two years, the financial wealth held by the first family surpasses by 65 per cent that of the second family, and by 26 per cent that of the third. In 2004, the first family's wealth amounts to 30 times that of the second and 5 times that of the third. Even if we take into account high transaction costs, wealth inequality between these households grows substantially over time. The example is based on very simple hypotheses,<sup>2</sup> but it already tells part of the story: capital gains may have a substantial impact on the level of wealth of individual households as well as on the shape and concentration of wealth distribution.

The paper is organized as follows. In the next section we discuss the various definitions of capital gains and the main results obtained in the literature. Section 3 reports the macroeconomic estimates, while Section 4 shows the microeconomic analysis, describing the data and the methodology used. The effects of capital gains on the level and the distribution of household wealth in Italy are illustrated in Section 5. Finally, Section 6 reports the main conclusions.

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<sup>1</sup> With respect to Italy, Zollino (2001) does not find relevant effects of capital gains on consumption expenditure, while Paiella (2004) shows that the effect of wealth on consumption, although slight, is statistically significant. Wealth variations accruing to real estate appear to influence consumption more than variations in financial wealth. On this subject, see also Mankiw and Zeldes (1991), Attanasio, Banks and Tanner (1998) and Paiella (1999). On the relationship between capital gains and labour supply see Henley (2001) and with labour mobility Cannari, Nucci and Sestito (1997).

<sup>2</sup> We referred to average returns for each class of assets. This set-up excludes within-class variability in asset prices. For example, between 1987 and 1992, the prices of houses in real terms more than doubled in Milan and Rome while, in the same period, they rose by a mere 10 per cent in smaller cities such as Ancona and Potenza (Banca d'Italia, 2002). Price volatility in the stock market is even more evident. Finally, the example excludes intra-annual price variations.

## 2. Capital gains: definitions and theoretical framework

### 2.1 Definitions

Following the national accounts (NA) definition, capital gains<sup>3</sup> represent the changes in wealth due to the variation in the prices of its components.<sup>4</sup> The overall variation in wealth  $W_t$  can be decomposed in capital gains  $CG_t$ , net savings  $S_t$  and net transfers  $T_t$  (transfers received net of transfers paid):<sup>5</sup>

$$\Delta W_t = S_t + T_t + CG_t \quad (1)$$

Capital gains can be classified into neutral  $CG_t^N$ , which are related to variations in prices due to the inflation rate, and real  $CG_t^R$  for the remaining part:

$$CG_t = W_t \pi_t + \sum_a p_{at} W_{at} = GC_t^N + CG_t^R \quad (2)$$

where  $W_{at}$  is wealth at time  $t$  invested in asset  $a$ ,  $\pi_t$  is the average inflation rate, while  $p_{at}$  represents the variation in the price of asset  $a$  that exceeds the yearly inflation rate.<sup>6</sup>

In what follows we will concentrate on real capital gains, which have effects on the distribution of purchasing power between households. Following the NA approach, we do not distinguish between either cashed and not-cashed capital gains or between expected and unexpected capital gains.<sup>7</sup>

Capital gains are not the only source of capital returns, as the latter may sometimes take the form of income (interest and dividends). Different assets show a different composition of these return components. For example, current accounts generate a capital income (interest) and no capital gains, while some investment funds generate only capital gains. Stocks lie somewhere in between as they yield both income (dividends) and capital gains.

From a conceptual point of view, capital gains differ from capital income in that they are not distributed to the owner, but remain included into the asset value: in order to cash them the owner needs to sell the asset. If the owner does not take any action, capital gains are reinvested in the asset that generated them. In addition, capital gains are much more volatile than capital income. For this reason they can have a different impact on consumption behaviour, especially when high transaction costs discourage the owner from cashing them.

Keeping in mind the different nature of these sources of capital revenue, the NA income definition adopted in this paper includes capital income and not capital gains. Savings are computed as the difference between income and consumption, and therefore do not include wealth variations generated by changes in asset prices.

<sup>3</sup> We use the catch-all "capital gains" label for both positive and negative changes.

<sup>4</sup> In a theoretical framework, only price changes unrelated to quality or quantity changes should be employed to calculate capital gains. In practice, the available price indexes do not always account for this. For example, when considering dwellings, the market price index is standardized with respect to the size, location and condition of the house, but not with respect to other possible sources of heterogeneity. Similarly, for stock prices, the MIB index does not disentangle profits that have not been distributed. Nevertheless, these assumptions do not appear to have a large impact on the results, as confirmed by some empirical experiments (for example, we measured the ratio between reserve budget and net capital for industrial firms).

<sup>5</sup> This scheme basically follows the definitions of the European System of Accounts (ESA95).

<sup>6</sup> The choice of the inflation rate as wealth deflator is not straightforward. Wealth is a reserve of valuables that is normally accumulated for future consumption. In order to deflate wealth properly, it would be necessary to know future prices, interest rates etc. On this topic see Reiter (1999).

<sup>7</sup> In the literature the first distinction is mainly related to taxation issues (Haig, 1921; Simons, 1938; Hicks, 1939); for a recent review, see Harris (2001). See also Edrey (2004).

Where the distinction between expected and unexpected capital gains is concerned, it is worth pointing out that capital gains, despite their high volatility, cannot be considered completely random. When deciding portfolio allocation, investors will take into account the opportunities for both income revenues and capital gains. Following this view, the expected component of capital gains should be added to capital incomes; in this case, the definition of capital gains proper would refer only to the deviation from the average value due to the random component. However, we will not adopt this distinction for two reasons. First of all, it is difficult to select asset price models that account for the time horizon of investors and for their heterogeneity. The estimation of expected capital gains is therefore dependent on subjective assumptions. Secondly, the long-run average of capital gains is normally much smaller than their variability, so that the correction has only slight effects on short- to medium-run estimates.

## 2.2 *Capital gains and wealth*

The literature dealing with the effects of capital gains on wealth mainly refers to the British and U.S. markets, where share ownership is more common than in Italy and wealth is therefore more dependent on the variability of stock prices. Research has focused mainly on the impact of asset price variations on the economic behaviour of households<sup>8</sup> and less attention has been devoted to the role of capital gains on wealth accumulation and inequality, even if there is a body of evidence showing that this aspect is important. For example, Greenwood and Wolff (1992) find out by way of a simulation model that capital gains are responsible for about one-third of the average growth in household wealth observed between 1962 and 1983 in the United States. Using the same methodology, Wolff (1999) confirms that this result also holds for the following ten years; cohort analysis shows that the contribution is larger for the oldest groups. When considering the effects of capital gains on inequality, Henley (1998) shows that in the United Kingdom between 1985 and 1991 concentration in household wealth grew as a consequence of the variations in house prices; this effect was partially curbed by the rise in the number of house owners.

In Italy, variations in house prices can have a large effect on household net wealth, because real assets account for the lion's share of households' portfolios. On the other hand, the impact on inequality is presumably lower as most families own the house they live in.

In the last few years, Italian households have progressively participated more in the stock market,<sup>9</sup> and the high variability of stock prices has increased the importance of capital gains for both the variance and the distribution of household net wealth. Cannari, D'Alessio and Venturini (2003) show that, during the second part of the 1990s, cross-regional differences in per capita wealth grew as a consequence of variations in the prices of financial assets.

Summing up, the literature on the effects of capital gains on wealth, although mainly related to the British and U.S. economies and adopting a different approach to the one we follow, shows that the contribution of capital gains to wealth is substantial. Thus, given the variation in the composition of portfolios held by Italian households and the recent variability of asset prices, capital gains could have played a significant role in the accumulation of wealth and in the evolution of inequality in Italy. In the rest of the paper

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<sup>8</sup> See, for example, Hendershott and Peek (1985), Peek (1986) and ECB (2003).

<sup>9</sup> In Italy, during the 1990s, the share of household wealth invested in the riskiest assets (shares, investment funds and bonds) grew considerably. On these aspects see Cannari, D'Alessio and Paiella (2006).

we analyse these aspects using NA figures and data from the Bank of Italy's Survey of Household Income and Wealth (SHIW).

### 3. Macroeconomic estimates

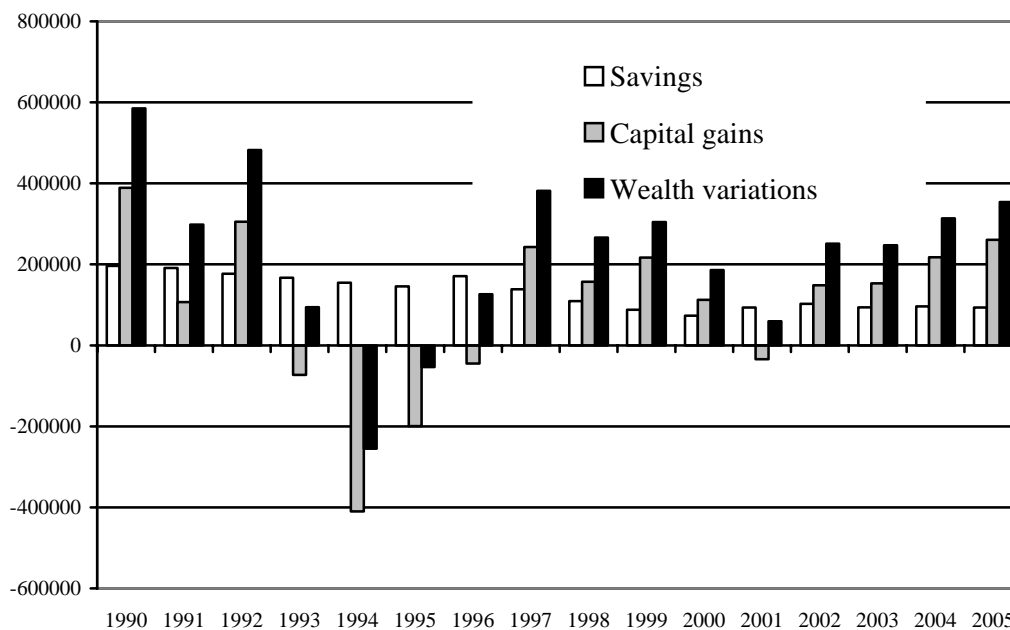
On a macroeconomic level, we can obtain an estimate of the relative importance of savings and capital gains for household wealth using two sources. Savings are derived from NA estimates for households and non-profit institutions. Levels of household wealth up to 1994 are estimated by joining the series from Brandolini *et al.* (2004) to the new estimates. Finally, capital gains are obtained as the difference between the variations in wealth and savings.

Figure 1 shows the estimates of household savings, capital gains and wealth variations in the period 1990-2005. Savings, expressed at 2005 prices (using the consumer price index for the whole nation), gradually decreased from €196 billion to €73 billion between 1990 and 2000, rising slightly in the following years.

On the other hand, wealth variations exhibit a more volatile profile than savings owing to changes in asset prices. In particular, at the beginning of the period wealth changes were mainly driven by house prices, which rose until 1992 and fell between 1993 and 1999, rising again in the following years. In the second half of the period, stock prices greatly influenced wealth variation as they rose until 2000, decreased sharply in the following two years and recovered thereafter.

Figure 1

**Household savings, capital gains and wealth variations**  
(billion euros; 2005 prices)



Source: Authors' calculations on data from Istat and Bank of Italy. Savings exclude depreciation. Wealth and savings are deflated using the consumer price index for the whole nation.

Overall, between the end of 1989 and 2005, household net wealth at 2005 prices grew by €3,640 billion, to €7,698 billion. In the period 1990-2005, household net saving amounted to €2,091 billion, equal to 57.4 per cent of the increase in net wealth. In the



same period, capital gains accounted for more than 40 per cent of the variations in household wealth.<sup>10</sup>

Between 1990 and 2005 capital gains equalled, on average, 13.4 per cent of households' disposable income, while capital income was about 30 per cent.<sup>11</sup> It should be noted that capital gains showed high variability during the observed period. During half of the period they exceeded (in absolute terms) one-fifth of disposable income. The sum of capital gains between 2002 and 2005 was about 90 per cent of disposable income in 2005.

While these results show the importance of capital gains in the process of wealth accumulation, they still do not give any information about the impact on different categories of households and on inequality. These aspects are analysed in the following paragraphs.

#### 4. Microeconomic data

Since 1962 the Bank of Italy has conducted its Survey of Household Income and Wealth (SHIW) with the aim of gaining deeper insight into the economic behaviour of households. The sample includes approximately 8,000 households and is drawn using a two-stage sample design.<sup>12</sup> The questionnaire collects information on demographics, income, consumption, savings, wealth<sup>13</sup> and several other topics. Further details of the survey can be found in Banca d'Italia (2006); in the rest of this paragraph, the emphasis will be on the aspects related to wealth evaluation.<sup>14</sup>

##### 4.1 Household wealth in the SHIW

Net household wealth is defined as the sum of real assets (dwellings, firms, valuables and durable goods) plus financial assets (deposits, government securities, bonds, shares, etc.) minus financial debts (mortgage and other debts).<sup>15</sup> On the other hand, we do not include in this definition cash, the part of the TFR retirement fund<sup>16</sup> already accumulated, and the actual value of the amount accumulated in private or public retirement funds because these items are not available in the survey. Interviewees were also asked to price each wealth component according to their beliefs.<sup>17</sup> Comparing SHIW

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<sup>10</sup> During the 1980s, capital gains were mainly negative and sometimes larger (in absolute value) than savings. Between 1981 and 2005, capital gains represented less than 30 per cent of real net wealth variation.

<sup>11</sup> Capital incomes include: rents for dwellings and land, distributed profits from corporations and quasi-corporations to households, profits invested abroad, interests, insurance profits and insurance incomes. They do not include mixed incomes.

<sup>12</sup> Since 1989 a part of the sample (about 50 per cent in the last surveys) is composed of households already interviewed in previous surveys (panel households). It is therefore possible to focus accurately on themes such as income, wealth and changes in job status.

<sup>13</sup> Wealth is detected also with respect to households' production activity when present.

<sup>14</sup> In this paper our calculations are based on data from the SHIW historical database, which contains information collected from 1977 to 2004.

<sup>15</sup> Where the distinction between direct and portfolio investments is concerned, firms are regarded as real assets when they are run (completely or partially) by the owner, while they are considered to be financial assets if shares are held only as a form of investment of savings. Consistently with the definition usually adopted in official Bank of Italy publications, durable goods are treated as a component of wealth.

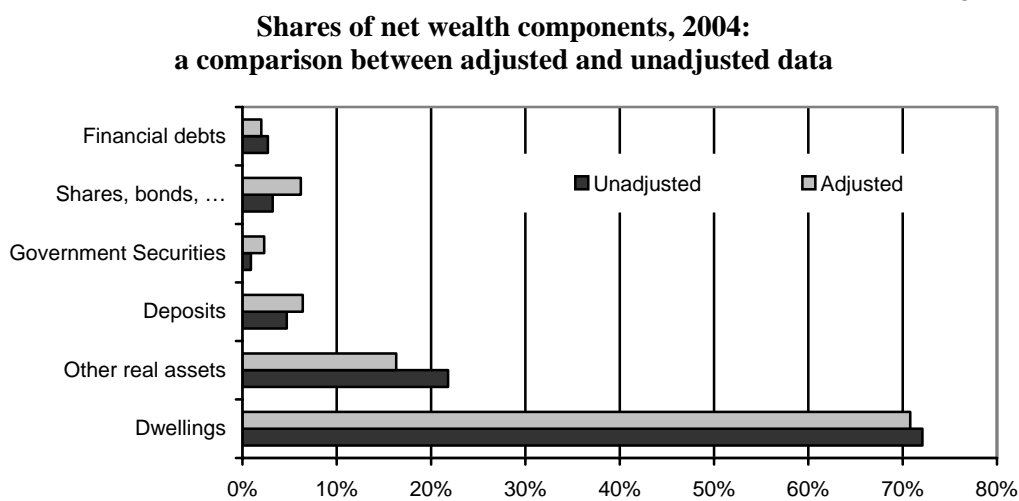
<sup>16</sup> When leaving a job, workers in Italy are entitled to a lump-sum payment, called *Trattamento di Fine Rapporto* (TFR); it represents a form of compensation due on departure, irrespective of the reason. For further details see Schivardi and Torrini (2004).

<sup>17</sup> The questionnaire does not specify any evaluation criterion for financial assets. We therefore presume that the subjective value provided by the interviewees is equal to the market price at the end of the year for shares, investment funds and other listed assets, and to their nominal value for the rest, such as government securities. On the other hand, when referring to debts, the questionnaire specifically requires the nominal value of the residual capital.

data on wealth with those from other sources such as NA, it is possible to notice some differences due to problems with the quality of the data collected in the survey, probably due to non-response of the richest households and to widespread non-reporting and under-reporting where asset ownership is concerned.<sup>18</sup>

It is necessary to account for the fact that response and reporting problems are dependent on the level of household wealth. For this reason we refer to the net wealth reconstruction method proposed by Brandolini *et al.* (2004).<sup>19</sup> This correction procedure yields a level of net wealth that exceeds the baseline survey estimates by an average of 40 per cent. Furthermore, it modifies the relative shares of wealth components; in particular, it increases the share of financial assets relative to real assets. For example, in 2004, after the correction, financial assets rise from 9 to 15 per cent of net wealth, while real assets decrease from 94 to 87 per cent (Figure 2).<sup>20</sup>

Figure 2



Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

#### 4.2 The estimation of capital gains

The estimation of capital gains is based on equation (2) and uses a separate price index for each wealth component. For dwellings (primary residence and other dwellings) we use the average provincial indexes calculated by Muzzicato, Sabbatini and Zollino (2002). These are based on data gathered by the magazine "Il Consulente immobiliare" and modified to account for national price variations observed in the survey, distinguishing between main municipalities and other towns.<sup>21</sup> Land has been priced

<sup>18</sup> These subjects have been widely studied in the recent past. See D'Alessio and Faiella (2002), Cannari *et al.* (1990), Cannari and D'Alessio (1993) regarding financial assets, and Cannari and D'Alessio (1990) on dwellings.

<sup>19</sup> The method is as follows: 1) design weights are adjusted in order to account for the different rate of survey participation, as stated in D'Alessio and Faiella (2002); 2) data on financial assets are corrected as proposed in Cannari *et al.* (1990) and Cannari and D'Alessio (1993); 3) data on non-residential dwellings owned by households are corrected following a method originally proposed by Cannari and D'Alessio (1990) and subsequently refined by Brandolini *et al.* (2004).

<sup>20</sup> These adjusted values are closer to the macroeconomic ones, although there are still some differences mainly due to heterogeneity in definitions and in classification rules. On these aspects see Brandolini *et al.* (2004).

<sup>21</sup> These variations have been adjusted using the national average price changes for houses, as gathered from the survey (net of refurbishing expenses), with the twofold aim of accounting for the differences in prices between large municipalities and other towns and of aligning average revalued wealth with wealth reported by households. Furthermore, we assume that all the dwellings are located where the household head resides.

following Povellato (1997). We assume that durable goods and other valuables do not generate any capital gains; apart from a few exceptions (such as cars and other means of transport), the former do not have a secondary market,<sup>22</sup> and there is no available price index for the latter, which anyway only constitute a small part of wealth. As to the value of firms,<sup>23</sup> we use the deflator of fixed capital stock (not including construction).

Capital gains are calculated for all assets involving share ownership<sup>24</sup> using the MIB historical index.

Capital gains for a given class of fixed-interest financial assets or liabilities are generated by interest rate changes applying to items in that class.<sup>25</sup> An increase in interest rates on the newly issued assets causes a fall in the value of assets already in circulation. Conversely, a rate cut for fixed-income assets produces a positive capital gain for the owner of assets of the same kind. In the same way, but with opposite signs, variations in passive rates generate capital gains for households with fixed-rate mortgages. The impact of changes in rates is higher the longer the time to maturity of the assets held.<sup>26</sup>

Referring to the definition adopted here, deposits and bonds (private and public) with variable interest rates have zero nominal capital gains, and therefore bear capital losses proportional to the inflation rate.

To evaluate the incidence of capital gains on wealth we adopt the Laspeyres index logic. Starting from survey data we estimate the (counterfactual) level of wealth that would have been yielded by capital gains only. In other words, we exclude savings, transfers and other variations caused by changes in the composition of household portfolios. Calculations are conducted both using 1989 as starting year and estimating chain indexes based on pairs of surveys. In the first case wealth composition is fixed at 1989, while in the second it varies between surveys. Of course, results based on chain indexes are closer to reality as they account for the evolution in household portfolios. Therefore, comparing these indexes can be useful for evaluating the effects of changes in portfolio composition on capital gains. In order to simplify the comparison of results, all the wealth components, reconstructed with the methodology described above, are evaluated at 2004 prices, using the consumer price index.

## 5. Capital gains in Italy according to SHIW data

### 5.1 Capital gains in 1989-2004

SHIW data show that between 1989 and 2004 nominal per capita wealth triplicated, from €42,000 to €129,000 (Table 1). Per capita wealth, reconstructed from the composition of household portfolios in 1989 applying the relevant price variation to each asset, was equal to €95,000; total capital gains thus equalled 60 per cent of the variation

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<sup>22</sup> On the evaluation of capital gains for goods without a secondary market see Hendershott and Peek (1985).

<sup>23</sup> In the survey, the value of firms is computed net of the value of buildings and land used in productive activity, which are instead treated as components of real household wealth

<sup>24</sup> This class also includes equity investment funds, whose incidence in total investment funds was estimated based on the data collected in the 2004 survey. Managed savings are regarded as investment fund savings.

<sup>25</sup> In the case of fixed-income assets, we employed the average gross revenue of BTPs (Buoni del Tesoro Pluriennali, i.e. treasury bills with a time to maturity longer than one year), estimated on bonds with an outstanding time to maturity in excess of one year. For debts, we used the interest rate series on medium-term and long-term loans calculated by Casolaro, Gambacorta and Gobbi (2004). Finally, the time to maturity for mortgages was estimated using SHIW data, and time to maturity for fixed-income assets was estimated based on time to maturity of BTPs (Bank of Italy, Base Informativa Pubblica on line).

<sup>26</sup> The series used to calculate wealth (price indexes, interest rates, time to maturity) are presented in Appendix A.

in nominal wealth. Savings, transfers and other effects due to portfolio reallocation explain the remaining 40 per cent.<sup>27</sup>

This comparison does not account for the variations in the general price index. Evaluating all figures at 2004 prices, the average per capita wealth in the period 1989-2004 rose by about 70 per cent in real terms, from €72,000 to €129,000. More than 40 per cent of this increase was due to real capital gains.

When using chain indexes, the contribution of capital gains to wealth variation does not change much. In this case, per capita wealth variations are estimated for each pair of consecutive surveys, keeping the portfolio composition observed in the first survey fixed. Finally, these results are summed over the entire period. There are no substantial differences between the results based on the two different indexes (1989-based and chain) because a large share of capital gains comes from the growth in house prices, and this wealth component is not subject to frequent reallocation due to the high transaction costs.

Overall, survey data and NA yield similar results: the contribution of capital gains to wealth variation is always positive with an exception, i.e. the sub-period 1993-95, when the real prices of dwellings decreased (Figure 3).

Table 2 shows that in 1989-2004 real capital gains were mainly influenced by the rise in house prices, averaging €28,000 or 63.8 per cent of total wealth held in this type of asset in 1989. Conversely, other assets such as deposits generated capital losses. During the period, the contribution of other wealth components to wealth variation was negligible. In particular, capital gains accruing to shares, although sizeable compared with the amount of wealth held in shares, represented only 1 per cent of total capital gains (€226 out of €23,096).

Table 1

**Per capita wealth variation and capital gains, 1989-2004**  
(euros, percentages)

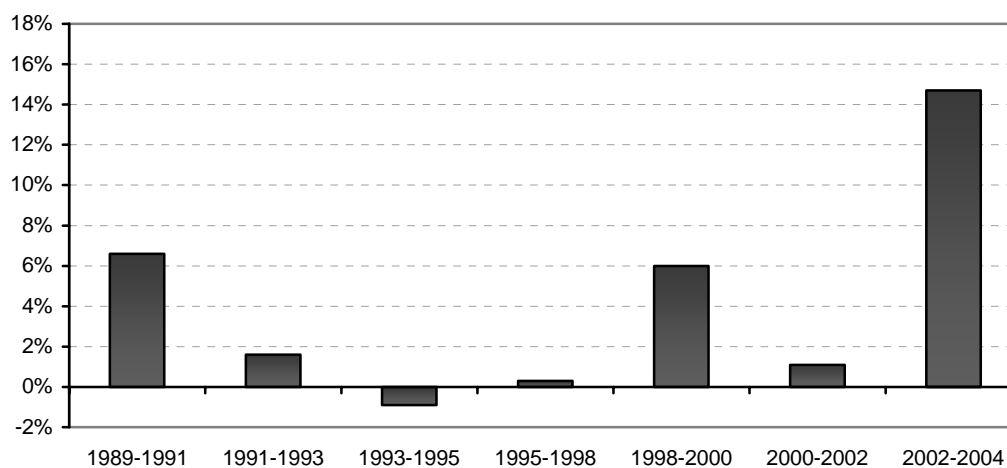
Variables	Average
(a) 1989 wealth at 1989 prices .....	42,503
(b) 1989 wealth evaluated at 2004 prices using the consumer price index.....	72,086
(c) 1989 wealth evaluated at 2004 prices using asset price variations .....	95,181
(d) 2004 wealth evaluated at current prices.....	129,408
(e)=(c)-(a) Total capital gains .....	52,678
(f)=(c)-(b) Real capital gains.....	23,095
(g)= [(d)/(b)-1]*100 Percentage increase in real wealth .....	79.5
(h)=(f)/[(d)-(b)]*100 Percentage contribution of real capital gains to wealth increase .....	40.3
(i) Percentage contribution of real capital gains to wealth increase, calculated with chain indexes	43.6

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

<sup>27</sup> We refer to per capita wealth in order to control for variations in household size and in the total number of households.

Figure 3

**Real capital gains, 1989-2004**  
(percentages of real wealth)



Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

Table 2

**Per capita real capital gains by source, 1989-2004**  
(euros, 2004 prices, percentages of wealth amounts of the same category)

Capital gain source	1989-1991	1991-1993	1993-1995	1995-1998	1998-2000	2000-2002	2002-2004	Total 1989-2004	1989-2004 Index (1)	1989-2004 Chain index (1)
Dwellings.....	6395	2512	394	-1356	4406	5240	17356	28147	63.8	71.7
Land.....	-56	-151	-74	-5	69	14	20	-181	-8.4	-8.4
Firms.....	111	-57	-213	-88	-9	10	13	-113	-2.4	-2.4
Bonds and BTPs .....	-61	-22	-69	232	-103	9	5	-157	-31.1	-15.4
Share .....	-271	-147	97	2474	2626	-2976	-48	226	20.6	20.6
Fixed rate mortgages	28	39	38	-88	-3	11	7	-43	-18.1	8.7
Other assets .....	-1368	-977	-979	-889	-784	-1072	-456	-4868	-40.9	-37.0
Net wealth.....	4779	1196	-805	280	6202	1236	16544	23096	32.0	32.3

(1) Percentage of wealth variation due to capital gains for each asset.

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

The analysis of capital gains during individual sub-periods reveals that the contribution of shares was more significant between 1995 and 2002, with a positive sign between 1995 and 2000 and a negative sign between 2000 and 2002. The contribution of land and firms is very small and with changing signs. Fixed-income assets generate only small capital gains on average, with the exception of 1995-1998 when these assets generated €32 of per capita capital gains. The variation in mortgage interest rates also produced few capital gains: the largest amount was between 1995 and 1998, with a per capita capital loss of €88.

## 5.2 *Distribution and concentration of wealth and capital gains*

To evaluate the contribution of capital gains to wealth distribution we consider how these gains were distributed in 1989-2004 among the different wealth classes.<sup>28</sup>

Chain indexes, calculated on per capita wealth, show that the contribution of capital gains to wealth variations increases with wealth itself (Table B1). This happens because over the period the prices of some assets, such as dwellings and shares, grew on average more than the inflation rate, so that the rich families that owned these assets received higher capital gains than the rest. On the other hand, other wealth components, such as deposits, generated negative capital gains equal to the inflation rate. Thus, households with lower wealth, typically holding mainly this kind of asset, did not gain from price variations (Table B3).

Capital gains measured with chain indexes show a clear dependence on education: households headed by university graduates have higher capital gains than households whose head has a lower level of education. This result can be due to several factors: a portfolio composition favouring assets, whose prices grew more in the period owing to lower risk aversion and/or higher levels of wealth of more educated households; greater ability on the part of families whose head has a high level of education to change their portfolio composition to include broad categories of assets with higher capital gains; more success in forecasting the price changes of single assets. Survey data provide us with unequivocal evidence that risk preferences differ considerably across individuals and that these differences have substantial explanatory power with respect to individual decisions. Guiso and Paiella (2005) show, for instance, that the risk-averse tend to invest less in education and are significantly less wealthy than the risk-prone; preferring less variable earnings, risk-averse individuals end up, on average, with lower capital gains. We also find that, in the case of more educated households, the estimates of capital gains based on the chain index are greater than the estimates based on the 1989 wealth composition; on the contrary, the chain index is lower than the fixed-base index for less educated households. This result suggests that educated households are better able to switch their portfolio composition towards more profitable assets than less educated households. Educated households, however, do not seem good at forecasting the future performance of single assets (we will consider this issue in the following sections). While education may help in assessing whether a whole market (i.e., the housing market or the stock market) is likely to be overvalued or undervalued at a particular time, it is less useful in helping households to predict, for instance, the price change of the shares of a single corporation.

Where age is concerned, chain indexes indicate that households whose heads are older reaped smaller benefits from capital gains, probably due to their lower propensity to risk, which generates portfolios that are less sensitive to price variations.

As far as place of residence is concerned, households living in the South or in large cities obtained fewer capital gains over the observed period. This result is mainly due to the fact that in 1993-99 house prices in large cities dropped more than house prices in smaller cities (where prices had grown less during the previous market cycle). In the following years, the trend changed and prices of dwellings grew more in large cities, producing higher capital gains for resident households (Table B2).

Summing up, capital gains have an important role in explaining wealth variations and produce a differential effect among the various household categories. It is therefore

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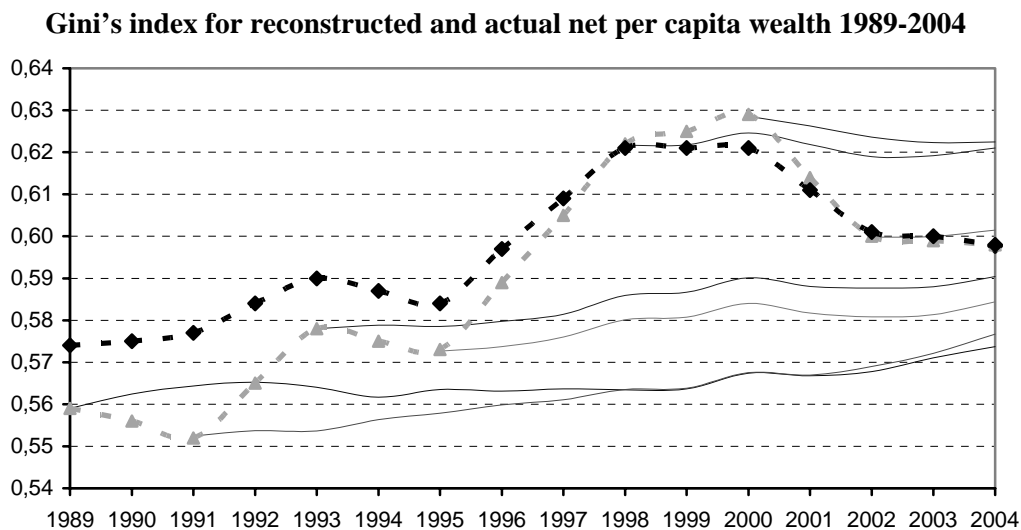
<sup>28</sup> See Table B1 in Appendix B for the total effect of capital gains in 1989-2004, and Tables B2 and B3 for a breakdown of capital gains by sub-period, source and wealth class.

interesting to evaluate the influence of capital gains on inequality and on the inter-temporal mobility of households between wealth classes.

In order to verify the effect of capital gains on wealth distribution we construct a measure of revalued wealth for each year, applying to each asset its price variation. We then estimate the Gini concentration index on this measure. These calculations are made for the whole period of analysis. For each survey we obtain a series of wealth concentration indexes calculated from the portfolio composition of each year and applying asset price variations in the different periods (Figure 4). We can then evaluate the change in wealth concentration over time after the variation in asset prices, *given the portfolio composition and the wealth level of the base year*. During the period, and in particular up to 2000, the concentration indexes show a clear upward trend, confirming the importance of capital gains in the growth of wealth concentration.

Results obtained so far do not consider changes in household portfolios over time. In order to account for this aspect, we compare the concentration indexes of nominal wealth with the ones estimated on wealth at 2004 constant prices. The bottom dotted line in Figure 4 represents the indexes calculated for each survey using current prices, while the top dotted line refers to concentration indexes calculated with constant prices. The distance between the two lines becomes wider in earlier years; in other words, wealth concentration measured at constant prices tends to be larger than the one measured using current prices, especially during the first part of the period. Between 1989 and 2004 the Gini concentration index rises by 3.9 percentage points; if asset prices are held constant, the increase drops to 2.4 points. We can therefore conclude that the variation in asset prices contributed to the increase in concentration.<sup>29</sup>

Figure 4



Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

Analysing Figure 4 we also observe that concentration indexes calculated holding portfolio composition constant (continuous lines) are more stable than the other ones (dotted lines). The differences are due to wealth reallocation, the influence of savings on

<sup>29</sup> These estimates indicate that more than one-third of the growth in concentration is due to price variations. This result must be interpreted with some caution as we do not take into account the fact that households with positive capital gains should increase their consumption and reduce their savings, partially offsetting concentration growth (and vice versa in the case of capital losses). The magnitude of the variations in consumption of each individual depends both on the perception of the persistence of price variation and on his expected residual life.

wealth variation (which is not included in the estimation obtained holding portfolio composition constant), and survey sampling factors (sample composition varies across waves, on account of changes in target population and sampling variability).

### 5.3 *Inter-temporal mobility and capital gains*

In this paragraph we study the impact of capital gains on the inter-temporal mobility of households between wealth classes. This aspect is not necessarily linked to the previous ones: changes in wealth distribution and concentration do not necessarily imply mobility, and vice versa. For example, if capital gains are a non-negative monotonic function of wealth they affect concentration, but they do not generate mobility; conversely, if all rich households suffer heavy capital losses (becoming poor) while all poor households enjoy large capital gains (becoming rich), the mobility induced by price variability is very high, but the distribution and the concentration of wealth may remain unchanged.

The analysis is conducted by revaluing assets held in the base year using price variations occurring during the period. Results obtained with this method should be interpreted with caution as they are based on the hypothesis that no portfolio reallocation occurs between survey waves. On the other hand, it should be noted that Italian households mainly hold wealth in the form of dwellings, which are seldom an object of reallocation due to the high transaction costs.

The share of panel households that move across wealth classes (defined as wealth quintiles) between one survey and the next is on average 46 per cent (Table 3); 5 to 10 per cent of families change wealth classes as a result of capital gains. The comparison of this result with the transitions actually observed on panel households shows that capital gains explain on average 15.5 per cent of observed transitions.

Considering that transitions among the panel component of the sample are probably overestimated due to measurement error, the impact of capital gains on wealth mobility is probably underestimated. On the whole, capital gains seem to be an important source of inter-temporal mobility among wealth classes, at least when considering periods of 2 or 3 years. Over a longer horizon, the share of families that change wealth class as a result of capital gains rises, although the increase is less than proportional to the increase in period length: as a consequence of asset price variation, between 1989 and 2004 some 17.9 per cent of families changed wealth class. This happened because a share of the wealth mobility induced by capital gains in short periods is absorbed during the longer intervals, simply reflecting a component of volatility in asset prices.

Table 3

**Transition between net wealth quintiles, 1989-2004**  
(percentage of households)

Period	Transitions due to capital gains	Transitions estimated on panel data	Contribution of capital gains
1989-1991 .....	9.4	47.6	19.7
1991-1993 .....	7.4	50.3	14.8
1993-1995 .....	6.2	40.4	15.3
1995-1998 .....	7.6	46.5	16.3
1998-2000 .....	5.0	46.5	10.8
2000-2002 .....	5.9	43.7	13.6
2002-2004 .....	7.9	44.1	18.0
Average.....	7.1	45.6	15.5

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.



#### 5.4 The role of capital gains in wealth dynamics

In this paragraph we evaluate the contribution of capital gains to household wealth dynamics with respect to the other wealth components (see equation 1), savings and transfers between families (gifts and bequests).

For panel households, we considered both the wealth variations due to capital gains<sup>30</sup> and those due to savings resulting from answers given in different waves (values are estimated for years between the waves); variations accruing to transfers were obtained from the 2002 monographic section, which provides retrospective information on this subject.<sup>31</sup> The use of retrospective data gathered in 2002 does not allow the analysis to be extended to 2004. Also, we cannot go back to the very start of the period because the number of panel households that stayed in the sample from 1989 to 2002 is too small. The analysis is carried out with respect to the sub-period 1993-2002.

Table 4

**Variance decomposition of wealth variations, 1993-2002**  
(percentages)

	Factor	1993	1995	1998	2000
1995	Capital gains .....	40.9			
	Savings .....	43.6			
	Received transfers.....	14.9			
	Given transfers (-).....	0.5			
1998	Capital gains .....	29.9	28.2		
	Savings.....	40.3	33.8		
	Received transfers.....	27.8	37.6		
	Given transfers (-).....	2.0	0.4		
2000	Capital gains .....	31.1	32.9	46.2	
	Savings.....	47.8	40.6	48.7	
	Received transfers.....	19.9	26.3	4.0	
	Given transfers (-).....	1.2	0.2	1.2	
2002	Capital gains .....	26.6	26.7	35.3	43.1
	Savings.....	54.3	52.0	51.7	32.4
	Received transfers.....	18.1	21.1	8.9	17.7
	Given transfers (-).....	1.1	0.2	4.2	6.8
Sample size (1)		591	680	1,267	1,750

(1) Panel households that answered to the 2002 monographic section (half of the sample). The number of families is thus equal for all the elements in the same column. The symbol (-) indicates that the component is negatively correlated to wealth variations.

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

<sup>30</sup> We normally refer to real capital gains, net of inflation. All components are valued at constant prices.

<sup>31</sup> In this experiment we refer to uncorrected wealth data, because adjustments do not account for the relations among the components considered here. Moreover, on the panel sample we calculate wealth as the sum of its components, rather than taking the raw observations. The difference between these two wealth measures is equal to a residual component due to many factors (measurement errors in the answer, incomplete definition of wealth, variations in household composition).

For each year, the variance of wealth variations can be decomposed using the relation that links the variance of a total with the covariances of the total and its components (Shorrocks, 1983):

$$\text{Var}(\Delta W_t) = \text{Cov}(S_b, \Delta W_t) + \text{Cov}(T_b, \Delta W_t) + \text{Cov}(CG_b, \Delta W_t) \quad (3)$$

It is therefore possible to measure the relative contribution of each component through the following ratios:

$$\text{Cov}(S_b, \Delta W_t) / \text{Var}(\Delta W_t); \quad \text{Cov}(T_b, \Delta W_t) / \text{Var}(\Delta W_t); \quad \text{Cov}(CG_b, \Delta W_t) / \text{Var}(\Delta W_t) \quad (4)$$

In general, we observe that the contribution of capital gains to wealth variations is relevant and equal to about 35 per cent. Savings explain, on average, approximately 45 per cent of total variance, while net transfers explain about 20 per cent (Table 4).

The small size of some of the samples suggests that these results should be interpreted with caution, partly because the importance of each factor may well vary over time. We can nevertheless observe that for longer periods the contribution of savings increases while the contribution of capital gains decreases. The variance of wealth variation over ten years, between 1993 and 2002, is due for one fourth to capital gains, for more than one half to savings and for 20 per cent to transfers.

### 5.5 Further considerations about price volatility

All the analyses reported in the previous paragraphs have been conducted using average price variations for each asset; we neglected an important part of the volatility, which may be important in explaining the distributive role of capital gains. The price of a house in the city centre can vary in a different way from the price of a house in the suburbs; a family that holds stocks can obtain different capital gains compared with a household with a different portfolio composition.<sup>32</sup>

The variability of price indexes for dwellings and stocks, the wealth components that appear more important in determining capital gains, is quite high. Yearly variations of stock prices between 1990 and 2004 show a standard deviation of about 25 per cent;<sup>33</sup> prices of houses per square metre show a standard deviation of yearly 1989-2004 variations (within provinces and types of municipalities) of about 7 per cent.<sup>34</sup> It is therefore worth evaluating whether and to what extent this residual variability depends on household characteristics.

The monographic section of the 2002 wave asks households to evaluate capital gains (cash and uncashed) on each asset they hold since it was bought. Based on these data, we study the link between stock price variations and household characteristics; we carry out two kinds of calculations. First we study the linear relation of capital gains, expressed as a percentage of the starting capital, with some characteristics of the head of household (gender, education and working status) and with geographical area of residence, population of the town of residence, family income and year of acquisition of the asset. In the second exercise, the dependent variable is equal to one when there is a

<sup>32</sup> According to survey data from the 1998 wave, households hold, on average, shares of 2.7 different companies. We do not have any further information about the specifics of these stocks.

<sup>33</sup> The estimate refers to the yearly variations in prices of the individual stocks included in the Datastream database.

<sup>34</sup> The variations in house prices between two survey waves, as declared by the owners, show a standard deviation of 20 to 25 per cent within a given province and type of municipality. Considering that the measurement error contained in survey data inflates variability (the Heise reliability index is equal to about 84 per cent; see Biancotti, D'Alessio and Neri, 2004), and taking into account the interval between surveys, we can estimate that owner-estimated yearly variations in house value per square metre have a standard deviation of about 7 per cent.

positive capital gain and to zero otherwise; we run a logistic regression model with the same independent variables used in the linear model. None of the variables turns out to be significant for any of the models; the sample dimensions are 500 and 700 units, respectively. The results of these calculations do not show the presence of any significant statistical relationship between capital gains and family income or education. This result is not surprising: a substantial body of literature on market efficiency points out that it is very difficult to obtain higher return on assets based only on publicly available information and individual forecasting abilities.

In order to decide how to invest their money, three out of four Italian households consult professional agents (banks, post offices, securities firms), while 27 per cent rely on advice from relatives or friends. These results show that no substantial share of households benefits from better information than the rest; everyone relies on either standard formal sources of information or informal non-professional advice which is presumably not particularly efficient or reliable.<sup>35</sup> Moreover, households appear to devote very little of their time to obtaining financial information. According to survey data for 2004, only 5 per cent of households holding financial assets spend more than one hour a week sourcing financial information, while more than 65 per cent do not spend any time at all doing so.

Where real assets are concerned, it is plausible that households normally do not own dwellings – in particular the house they reside in – for speculative reasons. We therefore expect the link between price variations and individual characteristics to be weak, partly because the estimates of house values already incorporate information on location (province and type of municipality) likely to affect the price.

These considerations suggest that for both stocks and dwellings variability around the average value is due to factors generally uncorrelated with observed socio-demographic household features. It is therefore possible to evaluate the impact of capital gains on wealth concentration and variability by simulating the wealth distributions obtained from the variation in average prices, and adding for each family a random element to account for residual variability.<sup>36</sup>

The introduction of this additional variability with respect to the case without random effects that we considered previously generates a slight increase in concentration levels.<sup>37</sup> We conclude that, during the observed period, the contribution of capital gains to the increase in wealth concentration is greater than the one found when omitting this component of variability. Furthermore, the introduction of a random effect increases the contribution of capital gains to transitions among wealth classes; on average, it rises from 15.5 to 19.9 per cent (Table 5). Similar results are found when repeating the exercise of variance decomposition carried out in Section 5.4; if capital gains are augmented by a random component reflected in wealth variation, the share of variability accruing to them increases.

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<sup>35</sup> The data show that only 4 per cent of the households who invest in financial assets are assisted by experts, while 3 per cent decide how to invest based on suggestions offered by the specialised press.

<sup>36</sup> This random component is drawn from a normal distribution with zero mean and standard deviation equal to the one estimated for each of the price variations and then added to the corresponding average. For houses, the estimated yearly standard deviation is 7 per cent. For stocks, we assume that each household owns shares in 2.7 different companies (the average value observed in 1998, the last year for which this information is available), and that the companies are randomly selected. The correspondent standard deviation is about 15 per cent.

<sup>37</sup> Should the random component be positively correlated with the amount of wealth, the effect on wealth would be stronger.

Table 5

**Variability effect on households' transitions between  
net wealth fifths, 1989-2004**  
(percentages of households)

Period	Transitions due to capital gains, without random effects	Transitions due to capital gains, with random effects	Transitions estimated on panel households	Contribution of capital gains without random effects	Contribution of capital gains, with random effects
1989-1991 .....	9.4	10.4	47.6	19.7	21.9
1991-1993 .....	7.4	9.5	50.3	14.8	18.9
1993-1995 .....	6.2	8.7	40.4	15.3	21.4
1995-1998 .....	7.6	10.1	46.5	16.3	21.7
1998-2000 .....	5.0	7.2	46.5	10.8	15.4
2000-2002 .....	5.9	8.5	43.7	13.6	19.5
2002-2004 .....	7.9	9.1	44.1	18.0	20.6
Average.....	7.1	9.1	45.6	15.5	19.9

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

## 6. Conclusions

This paper analyses the influence of capital gains on wealth distribution and growth. Estimates were obtained using different data sources.

The main results can be summarised as follows:

- macroeconomic estimates show that between 1989 and 2005 the net wealth of households (valued at 2005 prices using the consumer price index for the whole nation) increased by €3,640 billion, to €7,698 billion. In 1990-2005, total household net saving amounted to €2,091 billion, equal to 57.4 per cent of wealth variation. Over the same period, the contribution of capital gains to total household wealth variation was greater than 40 per cent;
- between 1990 and 2005, capital gains averaged around 13.4 per cent of household disposable income (which does not include them), while capital income was about 30 per cent. Total revenue from wealth, including capital gains, is one-third larger than when considering capital income only. It is worth noting that capital gains are highly variable over time and that during half of the observed period they were larger in absolute value than one-fifth of disposable income; in 2002-2005 the sum of capital gains was about 90 per cent of disposable income in 2005;
- analysing SHIW data, we obtained results qualitatively similar to the NA: between 1989 and 2004, the contribution of capital gains to per capita wealth variation was about 40 per cent in real terms;
- between 1989 and 2004, the Gini concentration index for wealth increased by 3.9 percentage points; if we hold asset prices constant, the increase is 2.4 points. Asset price variation explains more than one-third of wealth concentration dynamics;
- on average capital gains are more than proportionally higher for wealthier families; the effects on concentration are driven by price variations in houses and stocks;

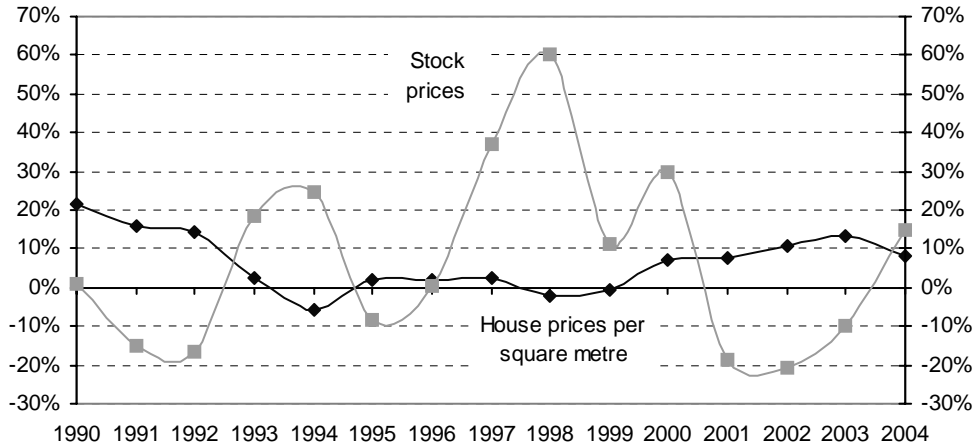
- 
- considering panel survey data, about 46 per cent of families change wealth class (classes are defined by wealth quintiles) between two subsequent surveys. Between 5 and 10 per cent of households change class due to capital gains. Capital gains explain, on average, 15.5 per cent of the actual transitions among wealth classes;
  - if we consider a wider time span when observing transitions, the share of households that changes wealth class as a result of capital gains increases, although less than proportionally to variations in the length of the reference period: between 1989 and 2004, 18 per cent of the families changed wealth class on account of asset price variations. A portion of the short-run mobility due to capital gains is absorbed over longer intervals, simply reflecting a component of volatility in asset prices;
  - using panel data to evaluate the relative importance of capital gains with respect to both savings and transfers, we find that about one-third of wealth dynamics is explained by capital gains, 45 per cent by savings, and 20 per cent by transfers;
  - simulations that account for the variance of each asset price around an average value calculated on a homogenous group of assets of the same kind (for example, the variance of stock prices for a single company compared with the MIB index), suggest that the contribution of capital gains to the growth in concentration and to transitions between wealth classes is probably greater than the one estimated using only average price indexes for each kind of asset.

## APPENDIX A

### DATA ON ASSET PRICES

Figure A1

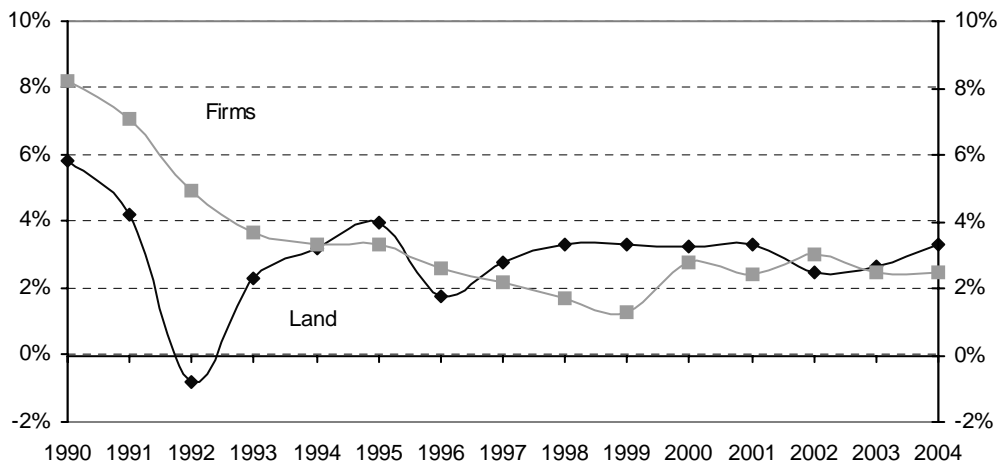
#### Variations of house prices per square metre and of stock prices, 1990-2004



Source: Stock price index MIB30 (Italian Stock Exchange); value of houses per square metre (calculations based on Muzzicato, Sabbatini and Zollino, 2002).

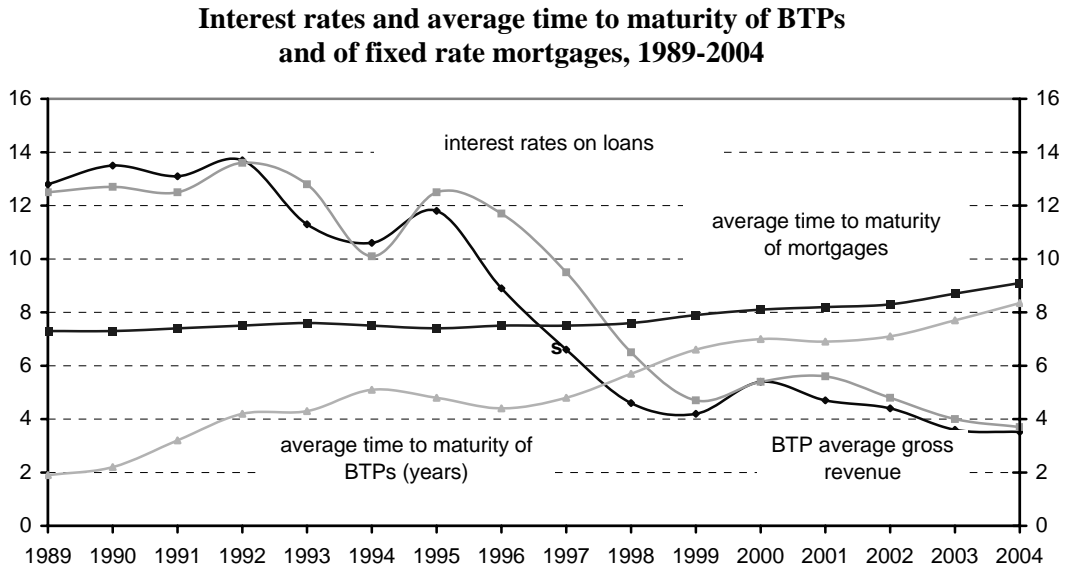
Figure A2

#### Variations of fixed capital goods (excluding construction) prices and of land prices, 1990-2004



Source: Land price index (Povellato, 1997). Fixed capital stock (excluding construction) deflator (Istat).

Figure A3



Source: BTP average gross revenue (for bonds expiring after one year): bonds quoted on the Italian Stock Exchange (Bank of Italy, Base Informativa Pubblica on line). Time to maturity of BTPs listed on M.T.S. (Bank of Italy, Base Informativa Pubblica on line). Average time to maturity of mortgages (calculations on SHIW data between 1995 and 2004, under the hypothesis that the mortgage was obtained during the year of acquisition of the house. Data on mortgage time to maturity has been estimated for years preceding 1995). Interest rate on consumer loans, medium-term to long-term (calculated by Casolaro, Gambacorta and Gobbi, 2004).

**APPENDIX B**  
**STATISTICAL TABLES**

Table B1

**Wealth increase and real capital gains between 1989 and 2004**  
*(percentages)*

	Per capita wealth growth between 1989 and 2004	Capital gains between 1989 and 2004 on per capita wealth	Capital gains between 1989 and 2004 on per capita wealth (chain indexes)
<b>Gender</b>			
Male.....	72.3	32.7	33.4
Female .....	79.6	29.8	28.5
<b>Age</b>			
Up to 30 .....	28.2	32.8	41.1
31-40 .....	65.9	33.6	37.5
41-50 .....	70.0	35.1	35.0
51-65 .....	55.2	30.8	32.4
Over 65 .....	98.1	27.5	22.3
<b>Education</b>			
None .....	72.5	28.7	21.7
Elementary school .....	68.5	32.5	25.5
Middle school .....	45.2	31.2	29.9
High school .....	67.5	33.3	35.1
University .....	82.9	31.0	37.2
<b>Work status</b>			
Employee.....	48.9	36.7	40.5
Self-employed.....	82.9	28.2	33.1
Not employed .....	90.1	29.2	22.2
<b>Wealth fifth<sup>(*)</sup></b>			
I fifth.....	21.5	-7.3	-7.0
II fifth .....	57.9	22.9	20.6
III fifth.....	81.6	34.9	38.6
IV fifth.....	79.5	35.4	35.0
V fifth.....	84.3	32.4	32.1
<b>Town size</b>			
Up to 20,000 inhabitants.....	72.0	35.0	34.8
20,000-40,000.....	116.6	33.9	35.9
40,000-500,000. ....	88.4	29.9	31.2
More than 500,000.....	37.6	27.8	21.0
<b>Geographical area</b>			
North .....	76.8	32.1	34.6
Centre .....	100.9	39.4	34.9
South and Islands.....	43.2	26.1	24.0
<b>Total</b> .....	74.2	32.0	32.3

(\*) The I fifth comprises households whose wealth lies below the first quintile; the V fifth comprises households whose wealth lies above the fourth quintile. The other fifths are defined accordingly.

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.



Table B2

**Real capital gains between 1989 and 2004**  
(percentages)

	Capital gains as a share of per capita wealth							Chain indexes
	1989 1991	1991 1993	1993 1995	1995 1998	1998 2000	2000 2002	2002 2004	1989 2004
<b>Gender</b>								
Male.....	6.9	2.0	-1.0	0.4	6.1	0.9	14.9	33.4
Female.....	5.6	-0.2	-0.8	0.0	5.9	1.9	14.0	28.5
<b>Age</b>								
Up to 30 .....	8.1	3.5	-1.3	-0.4	6.3	4.0	16.0	41.1
31-40 .....	7.7	1.1	-0.1	-0.6	4.8	3.9	16.8	37.5
41-50 .....	8.1	2.6	-1.1	-1.4	6.1	2.3	14.9	35.0
51-65 .....	6.1	0.8	-0.9	0.4	5.7	1.8	15.6	32.4
Over 65 .....	2.8	0.3	-1.5	2.9	6.8	-2.0	11.7	22.3
<b>Education</b>								
None .....	5.2	0.6	-0.4	0.1	4.8	-0.4	10.5	21.7
Elementary school .....	5.0	1.5	-0.6	-0.9	5.5	0.4	12.8	25.5
Middle school .....	6.0	1.9	-0.4	-0.8	5.4	1.9	13.2	29.9
High school .....	7.7	1.6	-1.1	0.0	6.1	2.1	15.2	35.1
University .....	7.6	1.0	-1.8	3.3	7.0	-0.1	16.5	37.2
<b>Work status</b>								
Employee.....	8.0	2.1	-0.8	-0.7	6.4	3.5	17.5	40.5
Self-employed.....	6.5	2.2	-0.6	1.0	5.5	1.6	13.5	33.1
Not employed .....	4.0	-0.3	-1.5	0.9	6.1	-1.0	12.8	22.2
<b>Wealth fifth<sup>(*)</sup></b>								
I fifth.....	-2.9	-1.3	-1.2	-2.2	-0.4	-1.7	2.6	-7.0
II fifth .....	4.1	-0.2	-1.5	-0.5	4.2	1.1	12.5	20.6
III fifth.....	7.2	2.6	0.0	-0.9	5.8	3.8	15.7	38.6
IV fifth.....	6.6	2.4	-0.9	-1.9	5.7	3.3	16.5	35.0
V fifth.....	7.1	1.3	-1.1	1.5	6.4	0.1	13.9	32.1
<b>Town size</b>								
Up to 20,000 inhabitants.....	4.4	3.9	0.9	2.6	6.1	0.2	12.9	34.8
20,000-40,000.....	6.1	2.4	0.0	1.7	6.4	0.6	14.8	35.9
40,000-500,000. ....	5.0	0.8	-0.1	-0.5	6.5	2.3	14.5	31.2
More than 500,000.....	14.5	-3.8	-8.9	-5.8	4.8	1.9	19.8	21.0
<b>Geographical area</b>								
North .....	6.1	3.3	0.3	1.6	6.8	0.4	12.4	34.6
Centre .....	8.5	-2.6	-3.1	-1.4	3.2	4.7	23.8	34.9
South and Islands.....	6.2	1.3	-2.0	-1.4	6.8	-0.1	11.8	24.0
<b>Total.....</b>	6.6	1.6	-0.9	0.3	6.0	1.1	14.7	32.3

(\*) The I fifth comprises households whose wealth lies below the first quintile; the V fifth comprises households whose wealth lies above the fourth quintile. The other fifths are defined accordingly.

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

Table B3

**Real capital gains between 1989 and 2004, by source and wealth class**  
(percentage of net wealth valued at 2004 prices)

	1989-1991	1991-1993	1993-1995	1995-1998	1998-2000	2000-2002	2002-2004	1989-2004 Chain indexes
<b>Wealth class<sup>(*)</sup></b>	<b>Dwellings</b>							
I fifth.....	0.90	1.51	0.51	0.01	1.19	0.53	4.15	9.08
II fifth.....	6.48	2.16	0.81	-0.29	4.56	3.27	13.55	34.06
III fifth.....	8.93	4.17	1.39	-1.03	5.72	5.36	16.37	47.60
IV fifth.....	8.38	4.11	0.32	-2.31	4.97	5.42	17.09	43.28
V fifth.....	9.53	2.89	0.29	-1.60	3.87	4.72	15.06	39.20
Total.....	8.87	3.26	0.46	-1.58	4.28	4.79	15.38	40.14
<b>Wealth class<sup>(*)</sup></b>	<b>Land</b>							
I fifth.....	-0.03	-0.12	-0.03	-0.01	0.04	0.00	0.00	-0.13
II fifth.....	-0.05	-0.21	-0.07	-0.01	0.05	0.01	0.01	-0.26
III fifth.....	-0.07	-0.18	-0.07	0.00	0.04	0.01	0.01	-0.27
IV fifth.....	-0.08	-0.18	-0.07	0.00	0.05	0.01	0.01	-0.28
V fifth.....	-0.08	-0.21	-0.10	-0.01	0.08	0.02	0.02	-0.27
Total.....	-0.08	-0.20	-0.09	-0.01	0.07	0.01	0.02	-0.27
<b>Wealth class<sup>(*)</sup></b>	<b>Firms</b>							
I fifth.....	0.03	-0.01	-0.06	-0.02	0.00	0.00	0.00	-0.06
II fifth.....	0.10	-0.03	-0.09	-0.04	0.00	0.00	0.00	-0.05
III fifth.....	0.10	-0.03	-0.13	-0.06	0.00	0.00	0.01	-0.12
IV fifth.....	0.14	-0.05	-0.12	-0.07	0.00	0.00	0.01	-0.09
V fifth.....	0.18	-0.10	-0.34	-0.13	-0.01	0.01	0.02	-0.37
Total.....	0.15	-0.07	-0.25	-0.10	-0.01	0.01	0.01	-0.26
<b>Wealth class<sup>(*)</sup></b>	<b>BTPs and Bonds</b>							
I fifth.....	-0.01	0.00	0.00	0.03	-0.01	0.00	0.00	0.02
II fifth.....	0.00	-0.02	-0.02	0.14	-0.01	0.00	0.00	0.08
III fifth.....	-0.02	-0.02	-0.02	0.06	-0.02	0.00	0.00	-0.02
IV fifth.....	-0.03	-0.02	-0.03	0.12	-0.04	0.00	0.00	0.00
V fifth.....	-0.13	-0.04	-0.12	0.39	-0.14	0.01	0.01	-0.02
Total.....	-0.08	-0.03	-0.08	0.27	-0.10	0.01	0.00	-0.01
<b>Wealth class<sup>(*)</sup></b>	<b>Stocks</b>							
I fifth.....	-0.03	-0.05	0.02	0.47	0.22	-0.54	-0.02	0.06
II fifth.....	-0.05	-0.13	0.07	1.37	0.71	-1.04	-0.02	0.90
III fifth.....	-0.05	-0.08	0.07	1.36	0.77	-0.83	-0.02	1.21
IV fifth.....	-0.13	-0.13	0.07	1.42	1.33	-1.44	-0.03	1.07
V fifth.....	-0.58	-0.25	0.14	3.92	3.42	-3.60	-0.06	2.85
Total.....	-0.38	-0.19	0.11	2.88	2.55	-2.72	-0.04	2.13
<b>Wealth class<sup>(*)</sup></b>	<b>Fixed-rate mortgages</b>							
I fifth.....	0.23	0.17	0.34	-0.26	-0.03	0.05	0.01	0.51
II fifth.....	0.07	0.12	0.10	-0.21	-0.01	0.03	0.03	0.14
III fifth.....	0.07	0.09	0.08	-0.16	0.00	0.01	0.01	0.10
IV fifth.....	0.05	0.05	0.05	-0.09	-0.01	0.02	0.01	0.09
V fifth.....	0.02	0.03	0.02	-0.08	0.00	0.01	0.00	0.00
Total.....	0.04	0.05	0.04	-0.10	0.00	0.01	0.01	0.04
<b>Wealth class<sup>(*)</sup></b>	<b>Deposits and other residual components</b>							
I fifth.....	-3.97	-2.81	-1.97	-2.42	-1.80	-1.73	-14.48	-26.33
II fifth.....	-2.49	-2.11	-2.26	-1.50	-1.09	-1.21	-9.74	-18.95
III fifth.....	-1.77	-1.33	-1.31	-1.02	-0.69	-0.75	-6.33	-12.59
IV fifth.....	-1.77	-1.34	-1.09	-0.99	-0.59	-0.72	-5.93	-11.88
V fifth.....	-1.84	-1.08	-1.01	-0.98	-0.78	-1.06	-6.56	-12.69
Total.....	-1.90	-1.27	-1.14	-1.04	-0.76	-0.98	-6.70	-13.13
<b>Wealth class<sup>(*)</sup></b>	<b>Total capital gains</b>							
I fifth.....	-2.87	-1.32	-1.19	-2.20	-0.39	-1.69	2.55	-6.97
II fifth.....	4.07	-0.23	-1.46	-0.53	4.19	1.07	12.48	20.56
III fifth.....	7.18	2.62	0.01	-0.87	5.82	3.80	15.75	38.64
IV fifth.....	6.56	2.43	-0.87	-1.92	5.71	3.30	16.52	35.02
V fifth.....	7.10	1.25	-1.10	1.51	6.44	0.11	13.87	32.10
Total.....	6.63	1.55	-0.94	0.33	6.03	1.13	14.38	32.30

(\*) The I fifth comprises households whose wealth lies below the first quintile; the V fifth comprises households whose wealth lies above the fourth quintile. The other fifths are defined accordingly.

Source: Authors' calculations on data from the Bank of Italy SHIW historical database.

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**DISCUSSION OF THE PAPER BY L. CANNARI,  
G. D'ALESSIO AND R. GAMBACORTA**

*Giulio Ghellini\* and Achille Lemmi\**

Why this two-man discussion of a paper? Very simple: the discussant cannot physically attend the session in which the paper is presented and asks a colleague who is present for other reasons to stand in. Obviously, as the impediment to attendance comes near the time of the conference, the absentee provides his substitute with the paper and an outline of what he wants to say. The substitute has a few hours in which to read quickly and to assemble a discussion, which ends up being a mix of some considerations thought out a long time ago and a set of sensations and impressions, more than true and real critical observations. A work – in short – somewhat cobbled together, but nevertheless the fruit of two readings and two complementary points of view.

Before getting into the specifics, a general consideration: the context of the conference covers a theme of great scientific value and fills a void in the academic literature on inequality, social exclusion, need, poverty or – more generally – living conditions. This is not to say that the analysis and measure of household wealth contrasts with these latter aspects, for only a very inattentive observer of socio-economic phenomena could think it contradictory to analyze aspects of wealth and poverty together.

Only those entrenched in exasperating technical exercises or influenced by extremist and flimsy ideologies can fail to see the true essence of the dynamics of an economic system formed by the so-called active economic units, institutional and technical structures and technologies that interact in suitable functional forms with the characteristics of fully-fledged production functions, the well known income and wealth generation function defined by Camilo Dagum among them. And in the development of economic systems, the structure of wealth often determines or in any case conditions the framework of poverty, inequality and the concentration of income.

So, in the current state of our quantitative knowledge of this phenomenology, above all for Italy, if the body of basic information on the state of hardship is coming to be acceptably complete and homogenous, the same is not true for wealth. And the contribution of analytical knowledge, together with a good start on a detailed statistical-informational description, that emerges from this conference, offers solid support for theoretical and empirical research. The academic community owes a debt of recognition to the researchers of the Bank of Italy.

In so doing, we are extremely grateful to the organizers of this conference for having included us actively and directly in the conduct of the conference. Our sincere compliments to the authors of the various papers for the completeness and authority of the essays.

Now let us turn to the essay by Cannari, D'Alessio and Gambacorta, whose title indicates how extremely topical and economically and socially relevant it is. Studying the variations through time (in the last 15 years) of the impact of changes in the price of capital (capital gains), on individual household wealth, is a promising approach to understanding the changes in the overall pattern of wealth, its distribution and its concentration. The analysis comes mainly at the micro level on the database of the Survey on Household Income and Wealth (SHIW), following a summary macro analysis that is

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helpful in quantifying the role of capital gains (they accounted for more than 40 per cent of the change in family wealth in the period 1989-2005), and at the same time provides a sort of benchmark for the microeconomic analysis.

That analysis proves to be extremely interesting not only for gauging the differential impact of capital gains on different types of household, but also for evaluating the role of the various components (housing, shares/bonds, bank deposits, etc.).

The findings: between 1989 and 2004 the rise in house prices was fundamental to the increase in capital gains (+€28,000). In fact, this is the component that determined the rise in wealth (see Table 2 of the paper), in that except for a slight contribution from shareholdings (+€226), all the other components had a negative impact. Leaving aside volatility which was present, however, though differentiated by component and congruent with developments during the period, the analysis by population segment brings out some extremely interesting trends: a) the contribution to wealth of capital gains increases with wealth itself; b) well educated households record greater capital gains than the poorly educated; c) young households do better than older ones; and d) households in the Centre-North better than those in the South.

The authors naturally hypothesize that these trends can have substantial effects on the distribution and concentration of wealth, and they confirm this by documenting the increase in the Gini index. From the comparative analysis of the index, taking 2004 as a base, and of the chain indices it emerges that the main component responsible for concentration was the change in prices.

The detailed analysis uses the panel component of the SHIW, to measure how capital gains have influenced household wealth mobility (a basic assumption that calls for caution is that between the two studies the composition of portfolios remains constant). Mobility between quintiles of the wealth distribution between one biennial survey and the next is on average high (46 per cent); the contribution of capital gains influences total mobility on average by 15 per cent (ranging between 10 per cent and 20 per cent in the various two-year intervals).

The role of capital gains with respect to other components in the determination of mobility is therefore observed through a subdivision of the variance of the variation in wealth between pairs of observations in three different components of covariance (capital gains, savings and balance between transfers received and given). It emerges that capital gains account for more than a third of the variation, savings for 45 per cent, and transfers for the remaining 20 per cent. The importance of capital gains, more volatile, tends to diminish as one lengthens time frame for measuring mobility, while that of savings increases. These results assume an average price increase for each component, thus ignoring the substantial impact of territorial volatility – (i.e. the increase in the value of a house changes with location) and of behaviour (i.e. the make-up of the share portfolio changes with the characteristics of the household). An empirical check was made using regression (linear and logistic), which found no significant relationship between capital gains mobility and the variables inserted in the model (household and territorial characteristics). The authors note that the literature stresses the difficulty in explaining this mobility with the standard variables (heterogeneity of behaviour unobserved).

A simulation is run, including a random component for each household, uncorrelated with the observed variables. It indicates a slight increase in the concentration of wealth, and also in the impact of capital gains in determining transition between different wealth classes (Table 5).

We have already mentioned the topical interest of the paper; now we should like to underline the methodological correctness of its instruments and statistical analysis.

Obviously some clarifications in our view would be helpful both at the macro and at the micro level.

(i) With regard to the macro analysis, just a methodological clarification: could the choice, in part forced, of considering transfers as the balance between values coming from two different sources (National Accounts for savings and the SHIW study for capital gains), possibly distort the estimates of the relative weights?

(ii) With regard to the micro analysis, one point is the data adjustment process by the authors themselves: is it possible to check and measure the extent to which these adjustments may have influenced the results, if at all. Perhaps, a few simulations could be of help in this regard.

A second general question concerns the fact that, in the analysis, the sample nature of the estimates, and hence of the significance of the variations found, is only marginally considered. Why not accompany the analysis with an effort to estimate the standard error, perhaps also through re-sampling methods?

More specific: the different trends in capital gains by age and education are analyzed in marginal terms even though they are presumably strongly correlated. It might be interesting to verify the joint effects (consistent with relative sizes in the sample), which could better explain the behaviour differences (for example, does a highly educated older family have greater or smaller capital gains than a young family with a lower level of education?). In other words, do the different risk propensities found by the authors depend more on age or on education?

Non-responses, even when adjusted by a MAR type-weighting system (if we are not mistaken, an adjustment that depends on the different observable typologies of household), presumably influence the results. In other words, does the selection process work according to unobservable criteria? If so, as the authors imply at times, why not apply estimating models that include elements of heterogeneity (using, for example, the panel component)?

On the analysis of wealth mobility: the same problem arises, and obviously in even more sensitive fashion, when analyzing the panel component of the SHIW study, given the substantial presence, especially in the medium term, of possible additional selection due to *attrition*.

A further clarification: the authors rightly note that the transitions are presumably overestimated due to measurement error (the offsetting of errors typical of cross-sectional estimates does not occur). The authors infer that the impact of capital gains on wealth mobility could be underestimated. But don't the same measurement errors that affect mobility also act on variations in capital gains?

A final consideration: the non-significance of all the variables observed in relation to capital gains, even if supported by a substantial literature, is somewhat surprising, especially for Italy. Couldn't it be that these results are due more to panel selection effects (the individuals that remain in the panel are similar in terms of non-observable wealth mobility behaviours), than to the actual absence of behaviours connected with some of the variables?

As we can see, Cannari, D'Alessio and Gambacorta have spurred the discussants to raise a series of questions that will hopefully encourage more detailed observations and better interpretations of the dynamics of wealth distribution. In our view, today there is an extreme need of refined statistical analysis like the present one, to design deliberate policy action for more harmonious and equitable social and economic development.





## **HISTORICAL PERSPECTIVE**

*Chairman: Ugo Trivellato, University of Padua*



## ESTIMATES OF PRIVATE WEALTH IN ITALY AFTER UNIFICATION: HISTORIOGRAPHY AND STATISTICAL METHOD

Alberto Baffigi\*

What we have done is more or less what one would do if he had to measure the height of the dome of St. Peter's without instruments.

Maffeo Pantalonì, *Dell'ammontare probabile della ricchezza privata in Italia*, 1884, p. 220.

### 1. Introduction

The great development in recent decades of quantitative economic studies of post-unification Italy has made possible more systematic interpretation and more accurate, critical evaluation of the basic data. As Simon Kuznets noted in 1955, "acceptable long-term records of national income and wealth and of their customarily distinguished components constitute indispensable minimum information in the study of economic growth." But between the two aspects, the literature has shown greater interest in flow than in stock variables. Our greatly improved knowledge of the temporal profile of Italian economic cycles in the decades preceding the First World War has come thanks to the studies of econometric historians on such variables as industrial and agricultural production, or more generally on gross domestic product. The methodological and historiographical problems relating to changes in national wealth have not sparked a debate comparable to that conducted from the initial studies of Alexander Gerschenkron through Istat's reconstructions and Rosario Romeo's interpretations down to the most recent works.<sup>1</sup>

This said, it nevertheless cannot be maintained that in economic historiography the question of wealth in post-unification Italy has been altogether forgotten. Those who have worked on the topic can be divided into two main lines of inquiry. One group of works uses estimates of wealth as a dimensional variable needed to measure the degree of development of the financial structure, following the approach inaugurated by Raymond Goldsmith (1969). The purpose is to study the role of financial structures in Italian economic development and industrialization by calculating indicators like the Financial Interrelation Ratio (FIR). Goldsmith, together with Salvatore Zecchini, made a major contribution to this field in 1975, although their estimates of Italian wealth referred only to ten separate years between 1861 and 1973, including just four of the 54 years between Italian unification and the outbreak of the First World War (Goldsmith and Zecchini, 1999 [1975]). Further study by Anna Maria Biscaini and Pierluigi Ciocca (1979) on the same subject did not use new or more frequent estimates than the preceding work. More recently the question has been taken up again by Giuseppe Della Torre (Della Torre, 2000; Della Torre *et al.*, 2006), who has highlighted the limitations of working with benchmark years rather than with time series. Della Torre suggests annual estimates of the FIR based on annual estimates of national wealth. In his work, however, the latter is essentially a side issue, with no specific in-depth inquiry.

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\* Bank of Italy. In drafting this work I had the benefit of helpful discussions with Luigi Cannari, Giuseppe Della Torre, Stefano Fenoaltea, Alfredo Gigliobianco, Matteo Gomellini, Rosanna Scatamacchia and Vera Zamagni. I should also like to thank the staff of the Paolo Baffi Library of the Banca d'Italia, whose helpfulness and competence were essential in locating much of the documentation.

<sup>1</sup> Bonelli (1978), Cafagna (1989), Federico (1982) and Fenoaltea (2006).

The second line of inquiry considers wealth in its psychological-social dimension, as a crucial variable underlying the conduct of local elites. This literature certainly does not ignore the quantitative aspect of wealth, but its purpose in studying it is to frame the typical conduct of selected social classes or representative individuals. Thus Alberto Mario Banti (1989) studies the bourgeoisie of Piacenza in the nineteenth-century and Anthony Cardoza (1995) that of Turin in the same period, while Vera Zamagni (1980) focuses on the protagonists – private and public entrepreneurs, bankers – of the structural transformation of the Italian economy in the first half of the twentieth century. While broadly sharing the main features of this line of research, Zamagni adopts the standpoint of national history. Further, she differs from other scholars in the importance that she ascribes to the literature on wealth of the first few decades after unification; in her article that literature serves as an analytical tool for proceeding to produce a rough estimate of trends in total private wealth.

To reconstruct the time series for Italians' private wealth, Zamagni (1980) starts from the annual estimates for 1901-1934 made by Sergio Retti-Marsani (1936; 1937) and extended to 1938 by Agostino De Vita (1941). These estimates are generally agreed to be reliable, given the wide range of sources and the valid method adopted.<sup>2</sup> Zamagni assumes that the estimates for the nineteenth century, all quite similar, are too low by 20 per cent and accordingly revalues those of Sensini (1904). Finally, she joins the series so obtained to that of Retti-Marsani and De Vita. But if such a simple, uniform revaluation of the older series was sufficient to Zamagni's purpose, getting significant macroeconomic data requires studying the matter in greater depth.

The merit of Zamagni's approach lies in recognizing the importance of the many statistical works produced in Italy between the mid-nineteenth century and the First World War, which sifted the extremely scanty statistical material available at the time for investigating the performance of the Italian economy in the difficult decades in which the national State was being constructed. Those scholars inquired into and estimated the country's wealth chiefly as a variable serving to gauge the growth and the cyclical state of the economy. Data were lacking, and the official statistical institutions failed to accord due importance to measuring the "economic movement", as the business cycle was known.<sup>3</sup> So estimating wealth was the work of academics or public functionaries acting at their own personal initiative. The revenue generated by the inheritance tax was the raw material for these studies at least until the first decade of the twentieth century (Coppola D'Anna, 1946, pp. 43-44, note 27). As one scholar noted, "when the direct method led to such great uncertainty owing to the insufficiency of the statistical data and the capitalization method could not ... be generalized to all States, it seemed that there was no better method of calculation than the indirect method based on inheritances, through which presumably all or at least most of every nation's wealth passes" (Maroi, 1918, p. 569).

<sup>2</sup> Retti-Marsani's estimates are consistent with the critique made by Gini (1909, 1962 [1914]) of the entire group of earlier estimates of wealth, which Gini held were too low. For some categories of wealth (agriculture land in 1914 and 1929), Goldsmith and Zecchini (1999 [1975]) use Retti-Marsani's estimates (1936; 1937). However, the latter refers to wealth held by the private sector (households) and the former to total national wealth.

<sup>3</sup> It is interesting to trace the debate within the Statistics Council on 15 December 1879 on Antonio Salandra's proposal for a series of observations to produce reliable estimates of the country's wealth (Atti della Giunta centrale di statistica, 1880, pp. 135-154). The opposition of Vittorio Ellena and the support for the proposal offered by Luigi Bodio and Angelo Messedaglia clearly show the distance separating the scholars with more political objectives from those of a more scientific bent. Pantaleoni (1884) commented on Ellena's position with great acumen and diplomacy. It is more complicated to understand Bodio, given his twofold character as expert and high functionary of the official statistical apparatus for nearly three decades starting in 1872. On the backwardness of Italian official statistics in the early unification decades, see Pazzagli (1980) and Baffigi (2006, 2007).

The wealth that these data could estimate, with some margin of error, was thus the wealth in private hands, a definition very close to what nowadays we call “household wealth”. It comprised real assets such as land and buildings, livestock, or valuable, and financial assets such as government securities, bank deposits, shares, credits and debt, and so on.

Methodologically, the main reference for the scholars engaged in estimating “the probable amount of private wealth” – notably Maffeo Pantaleoni, Luigi Bodio, Rodolfo Benini, Guido Sensini and Luigi Einaudi – was the French scholar Alfred de Foville. The logical framework of the methods derived from his work, with the significant differences discussed below, was this:

- 1) take the revenue raised by the inheritance tax and apply to it the tax rates to calculate the tax base, hence the wealth inherited;
- 2) estimate a multiplier to convert the wealth inherited into total wealth. This multiplier must take account of:
  - 2.1) the demographic characteristics of the population, in particular the death rate;
  - 2.2) tax evasion.

The first step is basically mechanical, but as we shall see it may be important to track changes in tax rates in order to evaluate trends in tax evasion. In what follows we examine the way points 2.1) and 2.2) were treated in the succession of studies conducted in the three decades up to the War. Demographic questions are dealt with in Section 2.1, tax evasion in Section 2.2. Section 3 summarizes. The data on the inheritance tax – the data actually used by the authors surveyed in Sections 2.1 and 2.2 – are treated on the basis of observations and conjectures drawn from the studies themselves, exploring their usable information content for the construction of a time series for Italian private wealth.

The estimates indicate that wealth grew rapidly in the first half of the 1870s. Then, after essentially stagnating to the end of that decade, growth resumed and continued until 1887. There ensued another protracted stagnation, which did not end until the turn of the century. This pattern is consistent with a chronology of the Italian economic cycle quite similar to that suggested by such contemporaries as Riccardo Bachi, Rodolfo Benini, Luigi Einaudi (alias “Spectator”), Vilfredo Pareto and Guido Sensini, a periodization to which recent studies have restored empirical robustness and logical plausibility.<sup>4</sup>

Compared with the estimates of contemporaries, the series as we have reconstructed it is higher for the period from the 1870s to the end of the century (Sensini, 1904), and the gap widens progressively in the last years of the century. From 1901 to 1913 the series is close to that estimated by Retti-Marsani.

The time series generated by the present work should be seen as the empirical product of the survey of the literature undertaken. It results from making operative the implications of those studies that had not previously been taken up or utilized. This is the first step, within a broader project that has yielded some encouraging initial results. Section 4 concludes the present work with a discussion of possible lines for future research, such as the use of additional sources to integrate into the analytical framework set out here and the application of complementary methodologies.

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<sup>4</sup> See Fenoaltea (2006); for a critique, see Cerrito (2003) and Pescosolido (2007).

## 2. Private wealth in the late nineteenth century: methods and data

Maffeo Pantaleoni in his first work on “the probable amount of private wealth in Italy” (1884), observed that “it is not possible, in serious fashion, to choose among the various methods of valuation adopted over time by economists to measure national wealth, and say: these are better than those. Because the problem does not manifest itself on a *tabula rasa* on which the economist can institute whatever premises he likes. Instead, it always takes this form: ‘Given the following statistical materials – for the most part compiled for utterly different purposes – make a rough calculation of the national wealth.’ From country to country and from era to era these materials vary – and with them, so do methods” (Pantaleoni, 1884, pp. 135-136).

In the three decades between the publication of Pantaleoni’s monograph and the First World War, wealth estimates in the various countries were based on “inventory” or “income capitalization” methods. More often the procedure was based on inheritance data (see also Gini, 1962[1914], Chapter 2).

The “inventory method” consisted in first dividing wealth into its components or categories, which were then valued using a variety of sources and conjectures, “arming oneself with the greatest possible number of economic, financial and statistical notions” (Pantaleoni, 1884, p. 148). This method was most systematically applied in the United States starting in 1840 with the ten-year census of wealth.

The “income capitalization method” consisted in establishing categories of private capital “according to what it was invested in: capital invested in the professions, in trade, in transportation, in land, in urban buildings, etc. For each of these categories, using the personal or real method, the total income is determined and a reasonable discount rate is set. The total income for each category is multiplied by the capitalization coefficient corresponding to that rate. The sum of the products gives total private wealth” (Gini, 1962[1914], p. 26). The capitalization method was applied successfully by Robert Giffen (1878) for the United Kingdom based on income tax data.

The lack of adequate sources of statistics for Italy, according to Pantaleoni (1890), ruled these methods out, so the only road left was to use the inheritance tax to estimate total private wealth from the part passed on each year. Pantaleoni held that this approach was acceptable “in desperate cases, when no other method can be expected to help” (Pantaleoni, 1884, p. 186). And that was the state of statistics in Italy. When Pantaleoni was writing, the method was attributed to the French scholar Alfred de Foville (1878 and 1879). And in practice it would be applied to Italy not only by Pantaleoni but by many others in the decades that followed.

The inheritance tax method was debated and variously interpreted in its different applications. The “private wealth”, to which referred those scholars, was the wealth inherited by individuals. It is basically what we nowadays call “household wealth”. Inheritance tax data reported several categories of wealth, very similar to those used in modern classification. First of all, wealth was divided into real property (*beni immobili*) and personal property (*beni mobili*). Then, the first group was made up of land and buildings, while the second included financial wealth (public securities, shares, bonds, deposits, etc.) and other personal property like valuables, commodities, ships, machinery and so on (Table 2).

The general logic of the method was as follows. The key is calculating a multiplier factor to generate aggregate private wealth from the wealth inherited in a year (and declared for tax purposes). The problem is essentially demographic, depending on the mortality of the population. We denote by  $q_t$  the probability that an individual belonging to the relevant population will die between time  $t$  and time  $t+1$ . We posit that this

probability is independent of the amount of wealth possessed. In this case the expected ratio of the wealth inherited during that period to total wealth will be  $q_t$ . Assuming further that a percentage  $k_t$  of the wealth inherited is not declared to the revenue service, then in order to calculate total wealth in year  $t+1$ , we must multiply the wealth subject to the inheritance tax by the multiplier

$$\mu_t = \frac{(1 + e_t)}{q_t} \quad (1)$$

where  $e_t = k_t/(1 - k_t)$  is the evasion coefficient.

So posed, the problem has two logically distinct parts. The first question is the numerical factor by which to multiply the wealth actually inherited in order to get total wealth (Section 2.1). The second, crucial question bears on the information content and completeness of the data. What is the ratio between inherited wealth as assessed by the tax authorities and the amount actually passed on? That is, how much is the amount reduced by tax evasion? This is the subject of Section 2.2.

### 2.1 Mortality and wealth

The earliest works to deal with the economic-demographic problem of extrapolating the total private wealth of a country from inheritance tax data used de Foville's method, based on the so called "devolutionary interval". It was based on a static view of demographic processes in which the main parameters describing a population, such as death rate and life expectancy, are essentially constants: their variations are deemed to reflect only secular changes. However, this view was in sharp contrast with the fundamentals of the Italian population, which in just those years was beginning the demographic transition, with substantial reductions in the death rate (Belletini, 1987, p. 39 ff.).

Against this backdrop, the first step in the de Foville method was to estimate the duration of the "inheritance generation" (devolutionary interval), i.e. the average number of years elapsing between the time a generation gets its inheritance and death (Coletti, 1907). According to the studies cited by de Foville, which were adopted by virtually all those using his method, this interval was stable at 36 years. A second assumption essential to the method was that the percentage of deaths for each generation was roughly equal to the percentage of total wealth that they held. So framed, the estimation of wealth was amazingly simple. In a stable population with an inheritance generation of 36 years, 1/36 of all wealth owners die each year. So multiplying the amount of legacies each year by 36 gives total private wealth.<sup>5</sup>

In 1907 Francesco Coletti questioned the robustness of this assumption and demonstrated the substantial variability of the "devolutionary interval", using the statistical data of *Movimento dello stato civile o della popolazione* (the official publication reporting demographic data).<sup>6</sup> But his method would not be widely adopted.

<sup>5</sup> The ratio between the numerical size of a statistical phenomenon (individual owners, securities in a bank's portfolio, litres of water in a bathtub, and so on) and entry and exit flows in a given period of time (which on the assumption of a stationary parameter are equal) gives the average duration of presence (of the individual, the security, the litre, etc.) within the aggregate. This is the *duration ratio*. According to de Foville, in the case of owners of wealth the ratio was 36. The inverse of duration gives the percentage ratio of owners that enter and leave the aggregate in each unit of time over total owners. To reduce the de Foville method to equation (1) this inverse proportion (1/36) can be interpreted broadly as the probability of an individual's dying and thus exiting from the population of owners.

<sup>6</sup> Coletti, 1907, p. 55 ff. The essentially demographic nature of the problem was underscored also by Rodolfo Benini (1906), who called for simplifying the question and suggested that the multiplier be the ratio between deaths and population only for those older than 25, as those younger were often propertyless. The multiplier, in this case, could be derived from the mortality tables.

Times had changed, and despite the serious lacunae that still plagued Italian statistics, estimates of wealth could now use richer and more reliable sources of data than twenty years earlier. Soon Corrado Gini, in meticulous works with an abundance of analysis and examples, would show the severe limitations and risks of the devolutionary interval method.<sup>7</sup>

According to Gini, all methods “have their shortcomings”: the inventory and capitalization methods<sup>8</sup> “can be applied reliably only to a fraction of assets, larger or smaller depending on the state of statistical observation in the country involved. Methods based on inheritance years or devolutionary interval can be extended to all types of asset, but owing to certain circumstances ... they give an excessively low estimate of wealth.” Gini proposed the “multiplier method” to “take advantage of the partial evaluations supplied by the methods of the first group and the general base for evaluation upon which the second group are founded.” (Gini, 1962[1914], p. 122). He suggested the following procedure:

a) Estimate some categories of wealth to which the inventory or capitalization method can be applied.

b) Divide the values of each category, so calculated, by the respective amount inherited in the same period. “In this way for each category of asset of known value, one obtains a certain figure (multiplier) which, multiplied by the amount of assets figuring in ... inheritances should produce the value of such assets present in the country.”

c) “From the multipliers so calculated derive, with appropriate adjustments, the multipliers for the other asset categories into which the yearly inheritance or devolution is divided” (*ibid.*, pp. 122-23).

Gini observed that the most delicate point was the adjustment of the multiplier to adapt it to other categories of wealth. In applications, such adjustment must take precise account of the fact that the various categories of wealth may differ both in the rate of tax evasion and in the mortality of their owners.<sup>9</sup>

A special case in which the method was applicable, according to Gini, was that in which multipliers calculated at time  $t_0$  are used at time  $t_1$ . “This procedure is based on the assumption that the multipliers are the same at the two times. ... It is tantamount to assuming that between  $t_0$  and  $t_1$  the value of the various categories of private wealth has increased in the same proportion as the respective categories of assets inherited.” (*ibid.*, p. 125).

Strangely, in suggesting this possible intertemporal application, Gini did not mention the need for appropriate but complicated adjustments, as he had with respect to application to different categories. Yet it would have been logical to extend the caveat concerning variations in tax evasion and mortality rates to this intertemporal application as well. The effect of death rates on changes in the multiplier over time had already been noted by Benini (1909), who observed that the “assets transferred annually from the deceased to their heirs represent, depending on their type, very different fractions of the

<sup>7</sup> More than half of the chapter on methods for estimating private wealth in *L'ammontare e la composizione della ricchezza delle nazioni* (Gini, 1962[1914]) concerned the devolutionary interval method.

<sup>8</sup> For a brief description of the inventory and capitalization methods, see Section 2. For a more thorough discussion, see (Gini, 1962[1914], Chapter 2). Gini also includes methods “based on transfers of property for a consideration” which for simplicity we do not include (*ibid.*, pp 30-34).

<sup>9</sup> Another circumstance to take account of in applying the multiplier method is that some types of asset that are hard to manage are often transferred as death approaches (*ibid.*, p. 123).



total amount possessed, type by type, by living individuals. This depends above all on the differing age composition between the groups of owners of one sort of asset as opposed to another.”<sup>10</sup> Benini calculated the multipliers for several specific asset categories,<sup>11</sup> finding that the multiplier for registered securities had increased very substantially between the first and second halves of the period 1892-1902. He ascribed the change to a fall in mortality rates, owing “to better health conditions in the country, holding the age composition of the owners constant” and/or “greater diffusion of registered securities among younger age-groups” (Benini, 1909, p. 123). His discussion is essentially descriptive, but it made an interesting point, not taken up by Gini: other things being equal, changes in owners’ mortality between one period and another will alter the value of the multiplier. This is taken into account in Section 3, where Gini’s multipliers for 1903 and 1908 are adapted to permit application to the entire period covered by inheritance tax data used in this work (1872-1913). To this aim, we use information from the mortality tables.

Another most significant modification of the multipliers related to trends in tax evasion over time, to which we now turn.

## 2.2 Tax evasion and the inheritance tax

Unfortunately, this literature offers no thorough, empirical, analytical studies of tax evasion over the entire period from 1872 to 1913. Pantaleoni’s first works, in 1884 and 1890, did not treat the matter and blindly “accepted what others took as truth, namely that evasion concealed about a quarter of the taxable wealth”. But that “evasion coefficient”, like the “duration” of the population, was drawn from de Foville’s work on France, and paradoxically Pantaleoni said he was “not at all disposed to defend this estimate of the amount evaded” (Pantaleoni, 1884, p. 211). Even Luigi Bodio, who in 1891 had put tax evasion at 16 per cent, in the 1896 edition came into line with the 25 per cent figure, which was endorsed by such other scholars as Luigi Einaudi (1902), Francesco Saverio Nitti (1904), Guido Sensini (1904) and Francesco Coletti (1907).

It took a quarter-century from Pantaleoni’s first work for scholars to grasp the crucial importance of measuring evasion in order to use inheritance tax data for statistical purposes. Thus in 1909 Corrado Gini commented polemically on the contrast between the heated debate on what he called the “integration coefficient” (the multiplier, i.e. factor  $q$  in equation (1)) and their lack of interest in determining the “evasion coefficient” (factor  $e$ ): “For the most part, scholars contented themselves with necessarily vague statements by high officials of the Department for State Property and Taxes [*Direzione generale del demanio e delle tasse*], who by virtue of their position were perhaps the least suitable for actually estimating the intensity of evasion” (Gini, 1959[1909], p. 72). Gini proceeded to calculate evasion coefficients that were differentiated by category of asset, estimating an average value of 46 per cent of the amounts determined by the tax assessors and adding that this figure was “if anything, low rather than high” (*ibid.*, p. 80).

The same year, Giorgio Mortara observed that studies of private wealth had not accorded “sufficient importance to the effect of legislative changes on the declared value

<sup>10</sup> He continued: “In fact, if the holders of a certain type of economic asset – mortgage credits, say – were so distributed according to age as to have an average mortality of 40 per mille, which is to say 1 in 25, it is obvious that, all other circumstances being equal, only the 25<sup>th</sup> part of the mass of mortgage credits held by them would go through inheritance each year” (1909, p. 118).

<sup>11</sup> The categories – registered securities, claims backed by lines, post office savings accounts, and real estate – were all drawn from the official inheritance tax classifications and have characteristics, such as registration or recording in official acts, that make tax evasion difficult. Evidently they were selected for study in order to keep the results from being distorted by tax evasion.

of the goods transferred. The tax rates set by the 1874 law, which raised them by two tenths, were raised by another tenth in 1888 (except for inheritances in the direct line of succession). Taxes were increased again by the 1894 law, which also, however, reduced the rate on inheritances or donations worth less than 500 lire by a tenth. Finally, the 1902 law instituted substantial tax breaks for portions and fractions of portions up to 1,000 lire in transmission by direct line of succession and between spouses. For the rest, that law generally retained the rates set in 1894 on portions or fractions of portions up to 50,000 lire and instituted progressive taxation on the part of the inheritance above 50,000 lire” (Mortara, 1909, p. 552). Based on this summary account, Mortara concluded that this series of tax increases had prompted growing evasion.<sup>12</sup> His argument was based on fragmentary evidence and resulted in no quantitative estimate of evasion. Still, the idea of posing the problem in retrospect and performing a qualitative analysis over the thirty-year period was a good one.

A more specific study, with a much larger set of empirical data, was that on “Inheritance tax evasion in Italy” published as Chapter 4 of Corrado Gini’s *L’ammontare e la composizione della ricchezza delle nazioni* (Gini, 1962[1914]). This is the fullest treatment of the subject for our period.<sup>13</sup> Like Mortara, Gini stressed the changes in the tax rate, especially that of 1902. For instance, for the data on the eight fiscal years from 1901-02 through 1908-09 there was “one real estate [*beni immobili*] legacy for every 35-36 property owners and one legacy of purely personal property [*beni mobili*] for every 350-460 owners of solely personal property. Obviously such a difference cannot be explained by differing mortality between the two classes of owners but must be attributed essentially to the differing frequency with which real and purely personal property legacies escape the tax authorities” (*ibid.*, p. 223). Gini also noted that the number of net positive inheritances – those in which assets are greater than debts – in proportion to the total number of deaths had risen gradually between the 1870s and the end of the century but fell perceptibly after 1902. And considering the categories of wealth inherited in different periods, “while over time the value of inheritances in the categories where evasion is small or negligible rises very significantly, in categories where evasion is easier it diminishes. But it is to be presumed that since 1888 bequest values have increased in the latter as in the former categories, albeit perhaps to differing extent” (*ibid.*, p. 245).

In addition to tracing general tendencies for the entire post-unification period, Gini focuses more analytically on data about 1903 and 1908. His analysis was conducted in large measure as a critique of the works of Luigi Princivalle. A functionary in the Finance Ministry, Princivalle was the butt of invective against the “vague statements of high functionaries of the Department for State Property and Taxes” and the author of a series of works on wealth published under the signature “L.P.” in *Bollettino di statistica e di legislazione comparata*. His detailed 1909 monograph *La ricchezza privata in Italia* (Private wealth in Italy) is always cited in bibliographies on the topic. As far as the

<sup>12</sup> For an interesting brief account of the evolution of inheritance tax law see Parravicini (1958, pp. 273-278). Gini (1962[1914], pp. 208-222) is also most useful. Supplementary information is available in Geisser (1915), Savorgnan (1916) and Contento (1916).

<sup>13</sup> Gini used a vast set of statistical data and indications to treat the problem from the standpoint of major economic and organizational questions, such as the incentives affecting the anti-evasion action of “tax collection agents”, private parties to whom tax collection was outsourced, who were “on commission, i.e. paid a percentage of the tax proceeds. ...First of all, the agents have a guaranteed minimum income, which was set at 2,000 lire before 1909 and now, under the law of 24 December 1908, varies with the category to which the agent belongs. They now have no incentive whatever for an exact assessment in the many districts where proceeds are ordinarily below the threshold level” Gini (1962[1914], p. 212). The rest of the chapter offers a more detailed analysis of the incentives shaping the anti-evasion conduct of the collection agents. For a summary of Gini’s study, see Geisser (1915). An interesting essay on the origins of the system for collecting direct taxes in Italy is in Frascani (1988), Chapter 1.

estimate of real estate tax evasion was concerned, Gini conducted the debate in highly polemical fashion, but he frankly acknowledged and reworked Princivalle's results on the other category of wealth, personal property, in an interesting application of the multiplier method.

Essentially, the dispute over the valuation of real estate turned on the credibility of the estimates effected by the tax authorities. Based on the official data, which he considered reliable, Princivalle concluded that in the 1903-04 fiscal year evasion did not exceed 12.5 per cent of the assessed value. "Gini," he commented, "instead maintains that evasion in respect of real property is equal to half its effective value, which is to say 100 per cent of the value taxed. Naturally, to explain how such an outcome is possible he accuses tax assessors and local authorities of complicity with the beneficiaries; and while he reports the consensus of the practical men he has interviewed, his roster of such practical men excludes the tax authorities and finance ministry bureaus" (Princivalle, 1909, p. 73).

Several years later, in the further course of the dispute, Gini observed that the estimate of the value of land, 24 billion lire, made by the Department for State Property and Taxes on the basis of an ad hoc study and subsequently published by Princivalle, was lower than the figure that Luigi Bodio and Stefano Jacini had arrived at separately, and this after the passing of "thirty years that had seen a virtually general and in many cases very substantial increase in prices" (Gini, 1962[1914], p. 150). To test the estimates of the Department and of Princivalle, Gini organized an alternative survey, asking the directors of the agricultural improvement service [*cattedre ambulanti di agricoltura*] to evaluate and, where appropriate, adjust the Department's estimates on the basis of the market prices of land in their respective provinces.<sup>14</sup> The data on the 27 provinces for which Gini received replies, most of them in northern and central Italy, indicated on the whole that the Department's estimates were too low, thus confirming his suspicions.<sup>15</sup>

The general underestimation of the value of land was due to the fact that the Department merely "applied certain coefficients to the cadastral assessment", which for some provinces, as the Department acknowledged, was simply the "old value of the properties", while for others it was based on the incomes recorded twenty or thirty years earlier (*ibid.*). Now, Gini argued, those incomes were surely lower than the incomes observable in 1908. Furthermore, in a country where the yield on the public debt stood at about 3.5 per cent, those values appeared singularly consistent with the Department's estimate of the market value of land.<sup>16</sup> On the basis of other sources,<sup>17</sup> Gini added his estimates of the agrarian income for the whole country (1,750 million lire), which,

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<sup>14</sup> *Cattedre ambulanti di agricoltura* were local institutions founded in many provinces in Italy from the mid-Nineteenth century to the great war. Their aim was to bring updated scientific agrarian culture among peasants.

<sup>15</sup> Gini (1962[1914]), p. 168. The data by province are given in pp. 164-67.

<sup>16</sup> Total gross cadastral income in the provinces in question, which at the time Gini was writing referred to the twelve years 1874-1885, amounted to 240 million lire. The Department's study estimated the market value of the same properties at 6,320 million. "It can be admitted that today, in those provinces, almost all of them in northern Italy, the return on land, net of operating expenses, taxes and the portions for management and administration, is about 3.3 per cent. Corresponding to this should therefore be a net income of 208.5 million. In 1907 the taxes and surtaxes on land in said provinces rose to 58 million. Income before tax but after the other expenses would therefore amount in 1907 to about 266.5 million, not much more than the assessed income (240 million) and probably not more than the actual income of the period 1874-1885" (*ibid.*, p. 174).

<sup>17</sup> "We can derive good elements for the valuation of land from the diligent work of the agrarian cadastral survey now nearing completion. It will tell us, with sufficient exactness, the annual quantity and gross value of the various kinds of product. Meanwhile, we can use a rough estimate of Italian agricultural production carried out by the Agricultural Statistics Office on the occasion of the bill on workplace accidents in agriculture (*Ibid.*, pp. 176-177). Gini derived net income from gross income so estimated by using the technical data found in handbooks such as Niccoli's *Prontuario dell'agricoltore* (1897) and information on the situation in France.

capitalized at the current interest rate, corresponded to a value of land close to 40 billion.<sup>18</sup> Further, Gini estimated the value of buildings at 16 billion lire for 1908 (*ibid.*, pp. 177-80). He was thus able to calculate a multiplier (our  $\mu$ ) for land and buildings in 1908. The average rate of tax evasion on real property, computed taking account of the adjustments by the Finance Ministry's technical offices to what was declared, worked out to 21 per cent (Table 1).

Table 1

**Total wealth and multipliers in 1903 and annual amount transferred by inheritance in the five years 1901-02/1905-06**

Category	Stock (millions of lire)	Annual amount transferred by inheritance (thousands of lire)	$\mu_{1903}^a$	$e_{1903}^a$	
Land, rural buildings and livestock <sup>a</sup>	40,500	506,440	80		
Urban buildings <sup>a</sup>	16,000	262,700	61	0.21	
Consols and other public debt securities	bearer	3,094	17,852	17,344	3.0
	registered	1,994	44,590	44	0.0
Bonds, certificates, shares, etc. issued by banks, companies and non-profit entities	bearer	2,927	21,017	139	3.5
	registered	846	27,458	30	0.0
Savings deposits, security deposits and current accounts	bearer	1,141	5,552	204	1.2
	registered	2,124	24,446	94	0.0
Cash deposits with Cassa Depositi e Prestiti	153	1,789	86	-	
Cash	1,322	10,725	123	-	
Credits secured by liens	2,300	90,040	25	-	
Debts secured by liens	3,000	73,000	41	-	

<sup>a</sup>For land and buildings, stocks refer to 1908 while annual amount transmitted by inheritance is the average for the two years 1907-08/1908-09. For land and buildings, the table gives the average, non-disaggregated evasion coefficient calculated by Gini (1962[1914], p. 233). The coefficient is computed on the basis of the assessments by the Finance Ministry's technical offices adjusting the amounts declared. The other coefficients are calculated assuming that evasion only concerned bearer (*al portatore*) assets and that the higher value of  $\mu$  for bearer assets with respect to similar registered (*nominativi*) assets was totally ascribable to tax evasion.

Sources: The amounts are taken from Princivalle (1909, pp. 79, 121-128) and Gini (1962[1914], pp. 181-186, 231-237). All the figures in the third column are also derivable from Table 2 in this paper.

<sup>18</sup> "In a State where the yield on the public debt is 3.50 per cent, one cannot admit that the net profit of landed property exceeds 4 per cent, even considering the special conditions of a large part of the South and the 'industrial' nature that agriculture has taken on in other parts of Italy" (*ibid.* p. 177).

Gini's was a major contribution to a discussion that had arisen some years earlier on the actual amount of Italian wealth, which some scholars contended was being increasingly underestimated in the most recent studies.<sup>19</sup> Francesco Saverio Nitti (1904), for example, writing five years before Gini's first study, had criticized estimates, notably those of "Spectator" (Einaudi, 1902), that showed wealth in Italy to be about the same as it had been between 1881 and 1885-86 and lower than in the previous decade. The "reawakening of the national economy in the past decade is undeniable", wrote Nitti. With "the population having grown so much since 1881 and with the industries that have been established, it is utterly improbable that wealth has remained stationary" (Nitti, 1904, p. 16). Nitti ascribed the errors of estimation to the unreliability of the data on inheritances.

Carlo Angelo Conigliani (1901) was another who argued back then that the estimates of private wealth in Italy were overly pessimistic. In addition to raising doubts of a general nature about the reliability of de Foville's method, Conigliani stressed two points indicating that evasion of inheritance tax had been increasing. First, the composition of wealth "in the contemporary economic environment" (Conigliani, 1901, p. 612) had increasingly taken the form of anonymous personal property, which lends itself to being concealed from the tax authorities. Since 1883 the paid-up capital of industrial companies limited by shares (*società per azioni*) had grown by nearly 1 billion lire. This increase had been accompanied by the repatriation of more than 1 billion of government bonds. "Now, the inheritance tax offers no reflection of this increase in domestic capital and elimination of external liabilities because most of the securities are bearer securities" (*ibid.*, p. 613). The second point Conigliani raised concerned the widespread and "official" practice for "at least the past twenty years" of capitalizing at 5 per cent the monetary incomes of "most of the wealth subject to inheritance tax. . . . Now, it is undeniable that in recent years monetary incomes from many personal sources have also been decreasing in Italy, and that the real-estate crisis has considerably diminished the monetary incomes from real property. . . . Thus, a great mass of wealth that goes to make up national assets (land, buildings, shares and bonds, registered securities) is shown in the balance sheet at a lower figure, thereby eliminating from the balance sheet the significant increases deriving from new accumulation, from the acquisition of new income-producing sources" (*ibid.*).

The diminutions in wealth reported by some authors were therefore only apparent, Conigliani argued. "In order to eliminate at least part of the effect of those apparent diminutions, it is necessary to take into account the actual variations in the interest rate for all those portions of the nation's wealth that are valued by capitalizing their monetary income. And since the normal average interest rate has certainly been falling in recent years, it is necessary either to lower the capitalization rate for the past few years or to raise it for the earlier years" (*ibid.*). The application of the method of multipliers, set out in the following section, takes its cue from Conigliani's suggestion.

### 3. The empirical implications of the historical survey

We will now exploit the empirical implications of our survey of the literature. Section 3.1 describes the methodology employed, while Section 3.2 presents and comments on the estimated time series of private wealth.

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<sup>19</sup> For an overview of the discussion from a "Ginian" perspective, see Maroi (1918, second part).

### 3.1 The methodology

A two-stage approach is adopted.

#### Stage 1

We apply the multipliers calculated by Gini (1962[1914]), reported in Table 1,<sup>20</sup> to the amounts of the respective categories of wealth assessed for purposes of inheritance tax (Table 2) for all the years for which disaggregated data are available. The multipliers refer to 1903 (land and buildings) and to 1908 (all categories of personal property). In symbols, we have:

$$\mu^i_{1903} \ (i = 1, 2, \dots, 12) \text{ and } \mu^j_{1908} \ (j = 1, 2) \quad (2)$$

where the multipliers  $\mu^i_{1903}$  are applied to the twelve categories of personal property and  $\mu^j_{1908}$  to the two categories of real property.<sup>21</sup>

#### Stage 2

Stage 1 is preliminary and serves to rebalance the distribution of wealth which in the tax data is tilted towards the categories for which evasion is harder. To take account of the possible variations of the multipliers over time, stage 2 calculates the values of  $\mu^i_t$  for the years other than 1903 and 1908. Using mortality tables for the years considered, quantitative hypotheses are formulated on  $q_t$  of equation (1), based on the discussion in Section 2.1. In addition, the discussion in Section 2.2 enables us to bring in hypotheses on tax evasion in the period 1872-1913 (coefficient  $e^i_t$ ).

We therefore have:<sup>22</sup>

$$\begin{aligned} \mu^i_t &= \mu^i_{1903} \cdot q_{1903}/q_t \cdot (1 + e^i_t)/(1 + e^i_{1903}) \quad (i = 1, 2, \dots, 10) \\ \mu^i_t &= \mu^i_{1908} \cdot q_{1908}/q_t \cdot (1 + e^i_t)/(1 + e^i_{1908}) \quad (i = 1, 2) \end{aligned} \quad (3)$$

Before presenting the estimated time series, it is worth dwelling on the import of the operations described above. The estimation of Italian private wealth performed in the two stages rests on some assumptions that must be kept in mind when evaluating the results. To begin with, it is assumed that inheritance tax evasion in the period considered took mainly two forms: 1) "concealment" of bearer assets, and 2) "diminution in value" owing to the excessively high interest rate used in capitalizing incomes.

Evasion by concealment is dealt with in the first stage by assuming that the factors and reasons that prompted heirs to hide part of the wealth inherited were constant over the forty years. No doubt this is a strong hypothesis, but pending further inquiry it is worth

<sup>20</sup> In order to obtain a multiplier for "furnishings" (*mobilia*) and "other personal property", not calculated in table 1, we followed Gini's (1962[1914], p. 186) guess which set it at 150.

<sup>21</sup> For the years for which disaggregated data are not available, we proceeded as follows. From 1885 to 1891 the total value of real property is available but not the breakdown between land and buildings; we obtained it by using the two categories' observed shares for 1892. For the years from 1872 to 1884 only the data on total inheritances, without disaggregation, are available; for those years we multiplied the tax data by the weighted average of the Gini-Princivale multipliers for the different categories of wealth, with weights given by the amount assessed for each category in 1885.

<sup>22</sup> In order to interpret (3), recall that, for (1) we have, for example,  $\mu^i_{1903} = (1 + e^i_{1903})/q_{1903}$ , from which, multiplying by  $q_{1903}$  and dividing by  $q_t$ , we get  $\mu^i_{1903} q_{1903}/q_t = (1 + e^i_{1903})/q_t$ . Multiplying then by  $(1 + e^i_t)$  and dividing by  $(1 + e^i_{1903})$ , we get  $\mu^i_{1903} (q_{1903}/q_t) (1 + e^i_t)/(1 + e^i_{1903}) = (1 + e^i_t)/q_t = \mu^i_t$ , that is to say the first expression in (3) (the same holds for the second expression). The coefficient  $q_t$  represents the average probability that an individual aged 25 or more, belonging to the Italian population in year  $t$ , will die within one year. We derived it from computations on the mortality tables of the *Human Mortality Database* (Glei, 2006). The coefficient  $e^i_{1903}$  represents tax evasion for wealth category  $i$ , expressed as a ratio to the amount of such wealth assessed for purposes of inheritance tax in 1903. On the basis of the assumptions adopted in the text,  $(1 + e^i_t) = 5/r_t$ , where  $r_t$  is the market yield on 5% government bonds (Bianchi, 1979, Table 1, p. 150). It follows that, in (3),  $(1 + e^i_t)/(1 + e^i_{1903}) = (5/r_t)/(5/r_{1903}) = r_{1903}/r_t$ .

verifying its empirical implications. Note, however, that its plausibility cannot be easily assessed without further information. Carlo Conigliani emphasized, for example, that personal assets were the form in which “private wealth initially accumulates”. “Provisionally, newly accumulated capital takes the form of monetary reserves, of deposits in savings banks, or is invested in bearer bonds as the easiest, most convenient employment. Only later, in the search for more income, is it definitively placed in other investments that tie it to a direct source of production” (Conigliani, 1902, p. 612).

Evasion by “diminution in value” is dealt with in the second stage, when, again following Conigliani, we assume that from the start of the 1880s onwards the discount rate for capitalization was 5 per cent, whereas the actual yield on government debt fluctuated downwards from about 5 per cent initially to 4 per cent at the end of the century. We correct for this by adjusting the discount rate to the market yield and assuming that the phenomenon was similar for all categories of wealth. This too is a strong hypothesis. But if for the time being we go along with Conigliani in assuming that the discount rate used for capitalization was constant at least from 1880 onwards,<sup>23</sup> we should add that the property assessment procedures of the time may well not have paid any great attention to market developments in defining the reference rate. For example, *Economia ed estimo dei miglioramenti fondiarii*, a text by the agronomist and engineer Leopoldo Di Muro, suggests that the assessor must determine the “rate of capitalization” by referring to a “rate known by word of mouth among experts, buyers, sellers, notaries, tax agents and, above all, known to the tax collection agent through whose hands all contracts of sale pass”.<sup>24</sup>

Lastly, there is the demographic question. We have assumed that the changes in mortality on average followed the same pattern observed for individuals older than 25, independently of age and of wealth category they owned. The calculations were performed taking into account the relation between the probability of death observed for those people in each year and that observed in 1903 (or 1908, for real estate and buildings). This hypothesis does not take into account that, in general, wealth distribution by age is not homogeneous and that its features can change over time, according to variations occurring in the life-cycle patterns of accumulation.<sup>25</sup> In fact, during a period of demographic transition, of which post-unification Italy is an example, the size of such changes can be relevant and permanent.<sup>26</sup> The question will need further treatment in future research.

### 3.2 Private wealth in Italy from 1872 to 1913

The time series obtained with the methodology described above is depicted in Figure 1, together with two reference series. For the period 1872-1900 the series estimated by Sensini (1904) was selected both for its span and because in its temporal profile and levels it is very close, indeed sometimes identical, to those found in other contemporary studies. This comes as no surprise, seeing that all these studies followed de Foville’s method, sometimes to the letter. Retti-Marsani (1936; 1937) instead belongs in

<sup>23</sup> There is no need to formulate hypotheses on the level of the rate applied; the crucial assumption is that the rate held constant, against the backdrop of a falling market rate (see the final part of note 22).

<sup>24</sup> Di Muro (1902, p. 238). His book was well received in international academic circles (Sanger, 1903).

<sup>25</sup> Scholars of the day were aware of the statistical relation between age and wealth. Gini (1962[1914], pp. 39 ss.) focuses on this stylised fact following Mallet (1908) who elaborated on a suggestion by the statistician Timothy Coghlan and estimated a multiplier to be applied to inheritance tax data.

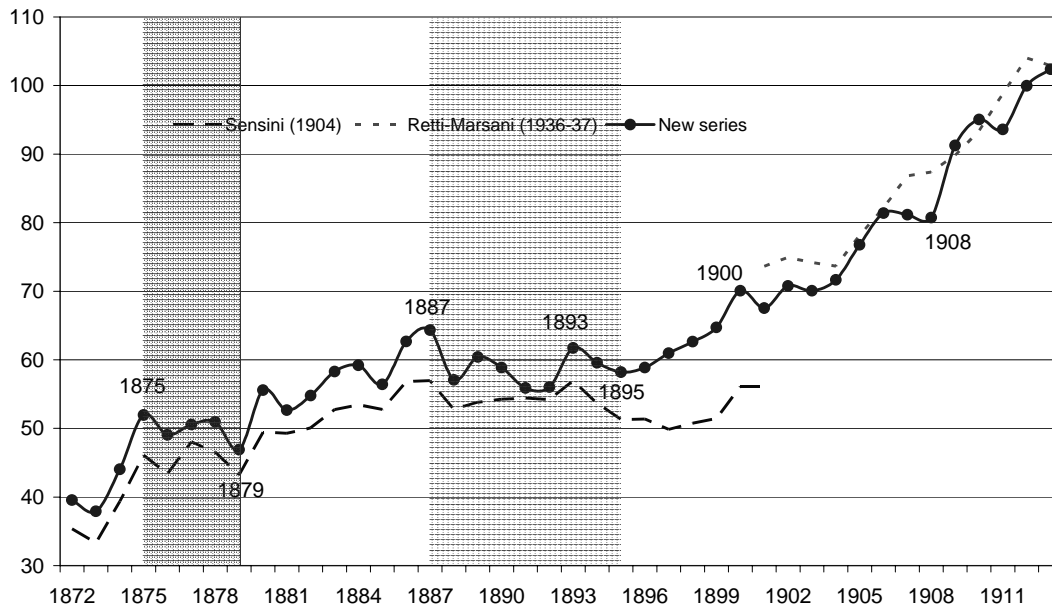
<sup>26</sup> For a general discussion on this topic, see Blackburn and Cipriani (2004).

every respect to the new generation of estimates, based on a multiplicity of methods all different from de Foville's.

Interestingly (and fortuitously), one series ends where the other begins. This brings out the contrast and quantitatively clarifies the object of the dispute over Italy's "impecuniosity".<sup>27</sup> Our results permit us to appraise the difference and to identify its roots in the rigidity of de Foville's coefficients (36 for the duration of the generation,  $\frac{1}{4}$  for evasion; see Sections 2.1 and 2.2). These factors provided a rather realistic multiplier on the whole for several decades, but intensifying economic and demographic development starting in the 1890s bared the method's excessive rigidity.

Figure 1

**Estimates of private wealth in Italy (1872-1913) (\*)**  
(billions of lire)



(\*) The shaded zones indicate periods of stagnating or declining wealth as emerging from visual inspection of the graph.

In Figure 1 we identify some turning points in order to delineate a periodization that can be used to check the historiographic plausibility of the temporal profile that emerges from our estimates. The forty years 1872-1913 can be divided into five periods, corresponding more or less to the periodization that contemporaries had in mind and to the behaviour of the time series that historians have made available in recent years (Fenoaltea, 2006).

<sup>27</sup> Nitti (1904) recalled de Foville's judgment that in Italy there reigned "ce que le bon Rabelais appelait 'l'impecuniosité'". Impecuniosity, said Nitti, should be taken as meaning above all "shortage of money, shortage of capital" (Nitti, 1904, p. 7). Nonetheless, as we have seen, Nitti considered the previous estimates of wealth too low.



- 1872-1875: Strong growth of private wealth. Sensini (1904), noting this result in his estimates, observed that it “probably indicates the very slight influence of the crisis of 1873” (Sensini, 1904, p. 299). This may be partly true (Luzzatto, 1968, p. 80). In any event, the poor quality of the data for this initial period, which Sensini himself suspected, must be recognized.<sup>28</sup>
- 1875-1879: Stagnation, with private wealth affected by the international economic contraction.
- 1879-1887: Rapidly growing wealth. Riccardo Bachi called this a period “of decided economic upswing, of active speculation in an environment reinvigorated by the gold imported with the loan contracted abroad in order to end the inconvertibility of the currency” (Bachi, 1914, p. 298). According to recent estimates, industrial production grew by about 4 per cent per year (De Rosa, 1985, pp. 18-24; Fenoaltea, 2006, p. 47; Pescosolido, 2007, p. 204).
- 1887-1895: The level of private wealth fluctuated, but trended downwards. The year 1887 was a watershed: “The first signs of decline appear. The threat, which became a reality, of the breaking off of trade relations with France produced violent oscillations in securities. The nadir of the crisis came in late 1893 and early 1894. This was truly the black year of the Italian economy. . . . If the economy had fared poorly in the preceding years, now it precipitated” (Einaudi, 1902, p. 118). There were failures of important banks, touched off by the building crisis. “But as if that were not enough, the pickaxe drove into the most vital part of the credit system, the institutes of issue, and in 1893 Banca Roma crashed after the famous inquiry, with a shortfall of 95 million lire” (*ibid.*). Bachi maintained that “between 1893 and 1894 the Italian economy reached its low for the contemporary era” (Bachi, 1914, p. 299).
- 1895-1913: The long expansion of the so-called age of Giolitti. “Between the end of the nineteenth century and the start of the twentieth the Italian economy embarked on a definite, increasingly evident upswing, one not marked by the passing depression that some countries experienced around 1900. . . . This phase of economic wellbeing, which characterized the dawn of the new reign [of King Vittorio Emanuele III], lasted until 1908-09; it had only a few features in common with the corresponding phase that had developed two decades earlier, after 1881. The foundations of the expansion were more solid now: the fabric of the nation’s economy had grown more robust in the long years of preparation, and economic life had taken on a new consistency and new form” (Bachi, 1914, pp. 299-300).

The business cycle dating which emerges from our estimate of private wealth time series is also validated by comparison with the most recent GDP estimates (Fenoaltea, 2006) over the same period (Figure 2).

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<sup>28</sup> Sensini cautions about the quality of these data, remarking that “Bodio, for example, in his *Indici*, did not report the figures from 1876 on” (Sensini, 1904, p. 299).

Table 2

Value of assets transferred assessed for purposes of inheritance tax by type of asset, 1872-1913

Fiscal year <sup>1</sup>	Real property			Personal property <sup>2</sup>													Gross inheritance value (col. 4+ col. 18)	Inherited liabilities	Net inheritance value (col. 19 minus col. 20)		
				Public security		Bonds, certificates, shares		Deposits		Cash deposits with Cassa Depositi e Prestiti	Claims other than from long-term leases <sup>4</sup>		Cash <sup>3</sup>	Furnishings	Other personal property	Sum cols. 14, 15, 16				Total personal property	
	Bearer	Registered	Bearer	Registered	Bearer	Registered	With lien	Without lien													
	Land	Buildings	Total	5	6	7	8	9	10	11	12	13	14	15	16	17				18	19
1872																				634,828	
1873																				608,822	
1874																				707,145	
1875																				834,250	
1876																				787,799	
1877																				811,650	
1878																				818,128	
1879																				753,155	
1880																				892,372	
1881																				845,574	
1882																				879,922	
1883																				936,084	
1884																				950,689	
1885			723,906														305,903	1,029,809	123,833	905,976	
1886			804,177														330,972	1,135,149	124,375	1,010,774	
1887			797,603														358,552	1,156,155	127,163	1,028,992	
1888			706,236	14,444	34,788	13,090	16,237	4,224	10,369	2,201	121,069						331,322	1,037,558	122,060	915,498	
1889			709,066	17,359	41,533	16,047	19,722	10,945	16,878	3,653	138,708					97,687	362,532	1,071,598	123,368	948,230	
1890			739,634	15,015	43,187	11,561	22,788	4,361	16,250	2,050	144,828				54,469	98,488	358,528	1,098,162	128,786	969,376	
1891			741,910	15,839	43,881	10,465	30,771	5,942	15,223	2,981	141,507						85,807	352,416	1,094,326	130,691	963,635
1892	496,947	253,974	750,921	15,215	43,454	18,399	18,988	4,679	15,640		147,983						83,615	347,973	1,098,894	134,405	964,489
1893	524,342	239,832	764,174	13,544	54,039	22,838	26,612	4,741	17,016	2,449	84,268	59,732					96,506	381,745	1,145,919	125,460	1,020,459
1894	485,580	222,956	708,536	15,441	58,753	26,488	18,802	3,422	15,259	1,827	88,169	44,459					83,890	356,510	1,065,046	119,941	945,105
1895	460,807	202,851	663,658	16,224	48,764	16,000	19,301	3,418	19,047	3,103	79,559	41,443					85,292	332,151	995,809	108,993	886,816
1896	467,901	204,549	672,450	13,112	38,707	13,615	22,365	4,660	17,942	4,500	84,420	51,972					84,858	336,151	1,008,601	108,428	900,173
1897	446,195	203,009	649,204	17,914	47,838	22,415	20,155	3,908	13,616	2,253	82,091	43,266					79,875	333,331	982,535	151,562	830,973
1898	461,127	196,407	657,534	15,996	43,153	17,985	35,083	3,418	16,932	1,935	77,441	38,398					78,546	328,887	986,421	112,910	873,511
1899	448,238	224,336	672,574	12,618	45,078	19,499	26,047	4,469	15,998	2,452	80,758	38,818					81,270	327,007	999,581	108,585	890,996
1900	476,121	230,960	707,081	47,533	49,166	25,602	23,010	4,620	20,034	2,696	85,052	46,972	39,454	33,672			86,450	391,135	1,098,216	126,431	971,785
1901	435,221	215,895	651,116	22,738	40,081	22,596	32,631	3,846	20,690	2,593	84,830	39,766					35,281	350,417	1,001,533	116,093	885,440
1902	469,556	216,923	686,479	15,762	45,151	18,610	26,876	4,942	20,598	1,736	88,062	37,924					33,774	317,149	1,023,619	112,615	911,004
1903	476,436	215,867	692,303	15,987	44,852	18,416	22,338	5,328	25,326	2,225	96,036	39,963					34,346	345,499	1,037,802	111,165	926,637
1904	454,084	217,200	671,284	14,360	55,440	24,230	24,774	6,560	21,956	1,022	89,852	60,829					33,566	372,874	1,044,158	111,734	932,424
1905	486,344	234,377	720,721	20,411	57,428	21,235	30,669	7,082	23,659	1,371	91,420	46,389					35,774	376,367	1,097,088	116,387	980,701
1906	498,601	247,583	746,184	13,688	45,748	38,232	42,195	5,716	21,575		73,372	43,025					35,131	359,803	1,105,987	124,949	981,038
1907	506,075	259,506	765,581	14,602	48,990	14,449	41,113	4,405	21,711	2,047	78,948	42,276					36,530	348,314	1,113,895	113,325	1,000,570
1908	506,805	263,035	769,840	13,838	49,146	15,816	30,935	5,527	24,937	1,756	81,245	43,935					36,227	347,037	1,116,877	114,078	1,002,799
1909	546,674	285,605	832,279	13,938	66,187	21,026	46,488	3,872	36,046	1,807	84,607	40,686					40,887	401,360	1,233,639	112,061	1,121,578
1910	567,849	294,327	862,176	15,194	68,685	16,351	40,162	5,954	30,203	2,232	81,544	45,100					39,949	389,484	1,251,660	113,197	1,138,463
1911	581,851	313,912	895,763	13,561	64,577	14,301	51,854	4,254	35,057	3,358	94,196	43,124					31,918	412,086	1,307,849	121,058	1,186,791
1912	593,795	319,751	913,546	9,411	56,156	11,667	64,115	4,761	34,738	5,377	86,890	43,816					40,824	402,401	1,315,947	126,364	1,189,583
1913	592,237	323,422	915,659	15,335	57,948	12,546	84,710	5,396	31,030	3,131	95,309	44,879					41,536	436,983	1,352,642	134,059	1,218,583

Sources: All the data come from publications of the Department of State Property and Business Taxes (*Direzione generale del Demanio e delle Tasse sugli Affari*).

1) **1872-1884** These data are not taken directly from the above-mentioned publications but from Sensini (1904, p. 295) and coincide with those used in earlier works (Bodio, 1896, p. 152, and Pantaleoni, 1890[1938., p. 181]). They were calculated by applying the tax rates to receipts and thus are partially dissimilar to those for the subsequent years, which were derived by the Department from direct examination of the tax returns filed by heirs (see Bodio, 1896, p. 152, and Sensini, 1904, p. 285). Disaggregated data are not available for this period.

2) **1885-1900** The Department retrospectively calculated the disaggregated values for the fiscal years from 1885-86 to 1900-01 (*Bollettino di statistica e legislazione comparata*, 1900-01, pp. 780-795). These data were used to construct our table.

3) **1901-1913** The data for the years from 1901-02 to 1913-14 are taken from the annual reports published in *Bollettino di statistica e legislazione comparata*.

Notes: <sup>1</sup> From 1872 to 1883 the fiscal year coincides with the calendar year. From 1884 on it runs from 1 July to 30 June of the following year.

<sup>2</sup> For 1885 and 1886 disaggregated data on personal property are not available.

<sup>3</sup> The figures for 1888 and from 1891 to 1899 also include the item “furnishings” (column. 15).

<sup>4</sup> The figure for 1892 is the sum of columns 11, 12 and 13.

Legend. Following are the complete descriptions of the column headings for personal property (columns 5-18):

“5, 4.50, 4 and 3 per cent consols and other public debt securities of the State” (bearer, column 5; registered and mixed, column 6).

“Bonds, certificates, shares and other negotiable instruments issued by credit institutions, companies, municipalities, provinces and other non-profit entities” (bearer, column 7; registered, column 8).

“Deposits of cash, security deposits and interest-bearing current accounts with ordinary and post-office savings banks, non-profit entities, credit institutions, companies, banks, private bankers and merchants in general” (bearer, column 9; registered, column 10).

“Deposits of cash with Cassa dei depositi e prestiti” (column 11).

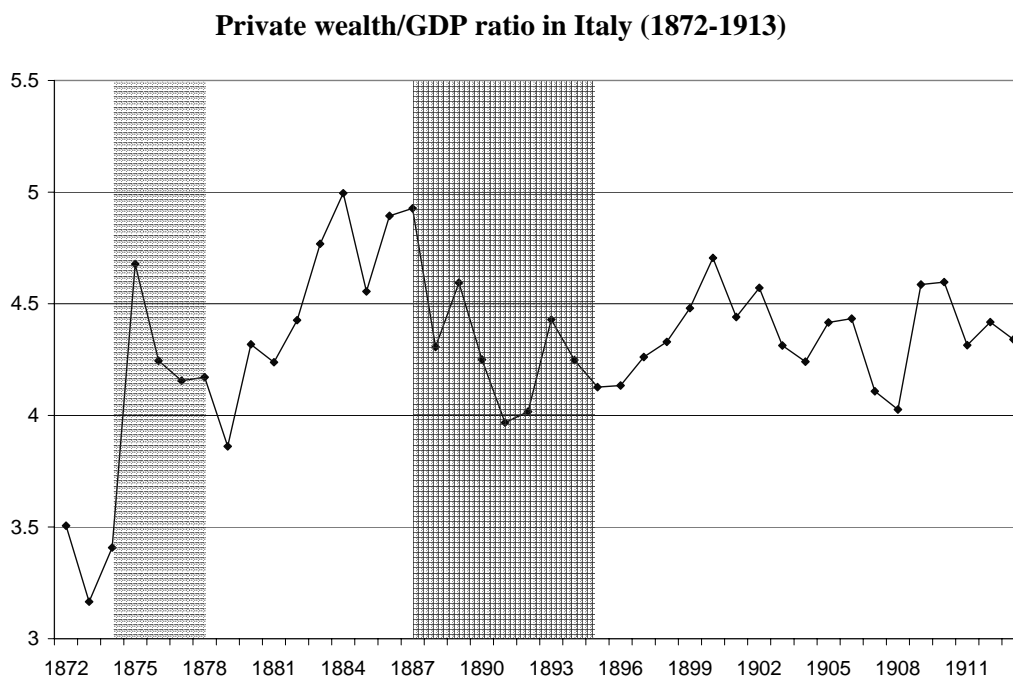
“Claims other than from long-term leases and associated credits” (secured by a lien, column 12; not secured by a lien, column 13).

“Cash and other personal property in general” (column 14).

““Presumed or actual furnishing, as per Article 52 of the Register Law” (column 15).

“Other personal property in general” (column 16).

Figure 2



Sources: Our estimates (for private wealth) and Fenoaltea (2006) GDP at 1911 prices, inflated with Istat coefficients.

The estimated amount of private wealth is between 4 and 5 times as big as GDP over the period studied in this paper, taking off the first years of the Seventies because of their limited reliability. The ratio peaked in the years just preceding 1887, when the housing bubbles exploded. For a general assessment of this ratio it can be remembered that in the Sixties of the last century it was more than 3, too; it grew gradually in the following decades up to a little more than 5, which is the most recent figure (Cannari and D'Alessio, 2006, p. 31).

#### 4. Conclusions

Our inquiry into private wealth in Italy from 1872 to 1913 has produced some interesting results and indicates several possible lines of further research.

The periodization of the Italian business cycle based on the time series of wealth we have constructed is consistent with an old, though somewhat forgotten, interpretation of the performance of the Italian economy in the decades after national unification, for which recent empirical studies have provided additional evidence. Our analysis, albeit preliminary, thus corroborates the view that the 1880s set the stage for the fuller modernization of the economy in the first decade of the twentieth century, the so-called Giolittian era.<sup>29</sup>

<sup>29</sup> Einaudi (1902), Sensini (1904), Bachi (1914), Fenoaltea (2006) and Pescosolido (2007).

From the standpoint of the sources, if we exclude the first half of the 1870s, this result shows the (not necessarily expected) importance of the informational content of inheritance tax data, at least as regards the cyclical sensitivity of their changes. As for the measurement of wealth level, our estimate stands as a useful link between the two statistical worlds made up by the nineteenth-century time series (Sensini, 1904) and that for the twentieth century (Retti-Marsani, 1936; 1937), especially as regards the level estimated: it provides some explanations for the pronounced divergence in the measurement of Italian's private wealth. However, it should be borne in mind that we performed our analysis on a single reference year, for which we had more detailed and abundant data compared with the rest of the period. These data were then projected, so to speak, onto all forty years of the period studied. The use of new sources, for example statistics on the tax on personal wealth or the reports of the Department for the Public Debt, would make it possible to construct new temporal reference points to which to anchor our estimates, making them more robust above all with regard to the crucial years of Italian industrialization.

The regional distribution of wealth, to which the literature of the day devoted ample attention, will also be the focus of future research work.

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## DISCUSSION OF THE PAPER BY A. BAFFIGI

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Reconstructing time series is not remunerative for Italian scholars. The monetary and opportunity cost is high and certain, the returns uncertain. Specialized journals are increasingly reluctant to publish the results of measurement exercises, however well designed. Moreover, the production of historical statistics is sometimes seen as a descriptive activity, ancillary to (historical) economic analysis. In short, measuring pays little if at all. Given this premise, Alberto Baffigi's paper "Estimates of private wealth in Italy after unification: historiography and statistical method", is a commendable contribution.

Baffigi deals with the wealth of households during the first half-century of the Kingdom of Italy (1861-1913). The macroeconomic variable involved is crucial to the study of the consumption behaviour of households and to the analysis of aggregate saving. The historical period considered is equally important for analysing the causes of the successes and failures that marked the course of Italy's "modern economic growth".

The essay is well organized. In its first section, Baffigi surveys the most significant empirical works in Italian economic-statistical literature, highlighting the limits and strengths of the methodological choices underlying the estimates of private wealth made in the past. In the second section, he identifies a set of "improvements" to the methods discussed earlier and applies them in order to estimate a new annual series of private wealth (1872-1913). The data used refer to the value of assets inherited as ascertained by the tax authorities for inheritance tax.

Baffigi is not the first scholar to have dealt with private wealth in pre-Fascist Italy. To my knowledge, Zamagni (1980) is the sole precedent in more recent decades. I agree with Baffigi's view that "The merit of Zamagni's approach lies in recognizing the importance of the many statistical works . . . that sifted the extremely scanty statistical material available at the time". In other words, the reconstruction produced by Vera Zamagni can be taken more as a point of departure than of arrival.<sup>1</sup>

In constructing the new time series of private wealth (Section 3), Baffigi asks readers to take some data as given. There is no need here to delve into the details: suffice it to cite the assumptions made concerning developments in the rate of tax evasion, the average length of the period between the time a generation inherits and the time of its death, the multipliers (calculated by Corrado Gini for the years 1903 and 1908), which underlie Baffigi's calculations for the entire period 1872-1913. We willingly do as Baffigi requests, because the arguments are well documented and often plausible. Once the estimates are made, however, we may require reassurances before confirming our initial concessions. In particular, there are two points on which further examination seems necessary: the estimates' statistical *precision* and their statistical *robustness*.

In the absence of standard errors associated with the point estimates of the new series, the intertemporal profile of the new series for wealth can only be taken and interpreted at face value. In theory, this raises some profound doubts. In practice, identifying a method for measuring the precision of the wealth estimates may prove

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<sup>1</sup> See also Kindleberger (1982). The work of Goldsmith and Zecchini (1999) contains estimates of Italian wealth, but only for four of the years in the period 1861-1913.

arduous, perhaps even impossible: a good deal depends on the nature of the underlying data, about which we would like to have more information than the current version of the essay gives us. If possible, it would be desirable for the author to assess the order of magnitude of the variation that can “reasonably” be considered significant (if calculating a statistical level of confidence in the conventional forms should prove impracticable).

As to statistical robustness, the quantitative analysis in the article would benefit from an examination of the role played by the assumptions adopted in Section 3. What, we would basically like to know is the impact of (modest) deviations from the values assumed for the technical coefficients discussed in Section 3.1 on the estimates of the new series. Sensitivity analysis would supply the lower and upper limits of the estimated series, thereby mitigating the consequences of the absence of confidence intervals.

Once the reliability of the series has been established, it would be useful to comment on the discrepancies between the new series (reconstructed by Baffigi) and the existing estimates. The author is correct in suggesting that his estimates represent a link between the statistical worlds of Sensini (1904) and Retti-Marsani (1936; 1937), yet both in the levels and in the trends there are discrepancies that need to be explained. Some are quite striking; for example, the levels of the new series are consistently higher than those for the period 1872-1900; there is also a divergence in the second half of the 1890s (highlighted in Figure 1). Other examples are less pronounced, including the estimates for the years 1889-1891 and for 1907. At the same time, I believe readers would be interested in having some discussion of the consistency of the new estimates with other independent time series, a selection of which is readily available from the historical reconstruction of the system of national accounts.

With regard to the potential use of the variable “private wealth” as a welfare indicator, I offer some simple, easily implemented suggestions: (i) transform the series into per capita (or per household) terms; (ii) deflate the series, so as to facilitate intertemporal comparisons in real terms (see the discussion in Cannari and D’Alessio, 2006); (iii) calculate a series of wealth net of the public debt (to accommodate the Ricardian equivalence argument).

Baffigi’s essay could also be supplemented in several other ways, that are perhaps less easy to carry out than those I have just indicated. Three examples are, I think, more convincing than others. First, the essay could devote more space to discussing the data, sources and institutional context. The data and sources have been exploited very little by economic historians and deserve greater visibility, while a discussion of the contemporary *institutions* would satisfy readers’ curiosity on some points. For instance, it appears reasonable to ask whether the levels of wealth are underestimated owing to bequests not subject to inheritance tax.

A second suggestion concerns the discussion of the *composition* of wealth and its changes. In its current version, the essay says virtually nothing about the reallocation of Italian households’ portfolios, a matter of considerable interest. The basic idea is, simply, that different assets are not perfectly substitutable, and that this influences not only the levels, structure and growth of household consumption, but also the distributive impact of alternative economic policy choices.

A third suggestion has to do with a desire to understand the determinants of the *changes* in wealth series. What was the contribution of capital gains? What was that of variations in property prices? A simple decomposition analysis could identify the role of the changes in determining the value of the wealth components. Adding these calculations would enable the author to improve the essay’s final section, which I think does justice neither to the quality of the work nor to its potential.

By way of concluding, I should like to point out a merit of Baffigi's work in connection with future inquiries, regarding the level of aggregation of the analysis. It would be extraordinarily interesting to extend the analysis to a regional level of disaggregation and even – data permitting – to a provincial level. To the extent that the data are available (and I think they are), a regional and/or provincial disaggregation of the analysis would make it possible to study the dynamics of Italy's geographical imbalances and by so doing contribute to one of the great issues of Italian historiography. Such a contribution would be based on fresh, authentically innovative data, and would be encouraged and welcomed by the entire academic community.

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## CONCLUSIONS

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At the beginning of these two days of reflection Ignazio Visco reminded us that the reasons why a Central Bank should monitor wealth statistics have been reinforced in recent years: phenomena such as the ageing of the population and increasing uncertainty regarding future incomes and the performance of the social state have increased the role of accumulated wealth in determining economic behaviour. Furthermore, besides the analytical motive traditionally connected to conducting monetary policy, recent events demonstrate the importance of monitoring financial stability.

The methodological works presented in this conference were designed to adapt macroeconomic statistics regarding wealth to international standards, using estimating methodology that allows regular updating.

The strong commitment of the Bank regarding macroeconomic statistics continues to be accompanied by intense sample survey activity, in a perspective of comparison and international cooperation, above all within the Eurosystem.

In March 2004 Luxembourg Income Study, statistics offices, central banks and research institutes launched a project, entitled LWS (Luxembourg Wealth Study) with the prime objective of developing a wealth database comparable on an international scale, using findings from existing surveys in the various countries. This project, whose work has recently been completed, has been supported by the Bank of Italy since its inception. The last conference was held at the Bank of Italy, last July (Rome, 5-7 July 2007). The use of these data, some of which have also been presented in this conference, will permit deeper understanding of the issues pertaining to wealth composition and distribution and its impact on important economic variables.

At the Eurosystem level, in February 2006 the Governing Council set up a task force to evaluate the possibility and opportunity of launching a harmonized sample study on household financial and consumption behaviour. It is widely believed that a harmonized study can make significant contributions to the research. The challenge is to design a study capable of pointing out differences not only in the development of financial systems, but also in institutions and legal and social regulations.

Macroeconomic estimates and sample data must be coherent with each other. The quality and completeness of both these sources can benefit from this coherence. Some of the work presented in this conference follows this approach. Further advances can derive from a wider use of administrative data reported to central banks, which will permit improvement in quality and design for sample surveys on household balances and also improve the representativeness of samples within each class of financial activity.

These steps involve a strong commitment and a continuing dialogue with the academic community, international institutions and the Central Institute of Statistics, for which these conferences represent an important moment. I wish to convey my sincere gratitude to all the guests who have accepted our invitation to the discussion. I would also like to take this final opportunity to reiterate the full willingness and availability of the Bank of Italy to further cooperate with Istat for the development of a complete system of real accounts.

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