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DO CAPITAL GAINS AFFECT CONSUMPTION? ESTIMATES OF WEALTH EFFECTS FROM ITALIAN HOUSEHOLDS' BEHAVIOR

by Luigi Guiso*, Monica Paiella** and Ignazio Visco**

Abstract

We use detailed data on housing prices in Italy available for a large number of years and with a fine geographical breakdown to compute capital gains and losses on the most widespread asset among consumers, housing, and inquire whether changes in housing values affect consumption. We find that consumer expenditures do react to capital gains, with a marginal propensity to consume out of real value changes of housing wealth of about 0.02. Reactions are different across types of consumers: while homeowners increase consumption when house prices increase, with a marginal propensity of about 0.035, the renters' response to the higher house cost tends to be that of increased savings. For the owners of listed stocks the response to capital gains is difficult to estimate with statistical precision, even if, for the limited sample of owners of these assets, its negative sign may be indicative of prevailing substitution over income effects.

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Contents

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1. Introduction[1]

Whether and how much changes in consumers' wealth affect their consumption decisions is relevant for a number of reasons, including a better understanding of how asset prices impact on the economy and how monetary policy works. Following the seminal contributions of Modigliani, Brumberg and Ando[2] of about half a century ago, there has been a lively and important debate on the nature of the relationship between wealth and consumption and on the timing of the "wealth effects" that changes in asset prices may have on consumption. More recently, the question about the relevance of wealth effects in consumption has been raised in connection with the stock market boom of the 1990s and the slump of the last few years.[3]

In this paper we study the effects of changes in the market price of consumer assets using micro data on Italian households available biannually for more than a decade. We isolate two sources of wealth re-valuations, changes in the market value of housing and changes in the market value of stocks, but focus primarily on the former. Whether the dramatic changes in stock prices that have been observed during the 1990s have affected consumption or not is of primary importance to understand the business-cycle effects of stock market booms and crashes. Many studies have indeed focused on the effect on consumption of capital gains on equities. However, stocks are only one of the assets in which consumers invest their savings. Furthermore, aside from the United States where half of the population invests in stocks, in most countries equities are only held by a small fraction of wealthier households (Guiso, Haliassos and Jappelli, 2001), whose consumption is possibly less responsive to changes in the market value of wealth. On the contrary, real

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[1] This paper has been prepared for a volume in memory of Albert Ando. We thank Giuseppe Grande and Francesco Zollino for providing us with the asset price data. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Bank of Italy. E-mail for correspondence: monica.paiella@bancaditalia.it.

[2] See especially Modigliani and Brumberg (1954 and 1980), Modigliani and Ando (1960) and Ando and Modigliani (1963). For a discussion of the relation between the life cycle hypothesis advanced by Modigliani and his co-authors and the permanent income hypothesis advanced by Friedman (1957), see Deaton (1992).

[3] See Poterba (2000) for a survey of the time-series evidence and Case, Quigley and Shiller (2001) for a cross-country comparison. Boone and Girouard (2002) and Bayoumi and Edison (2003) provide macroeconomic estimates of wealth effects based on panel data for several countries.

estate and housing investment is widespread and for many households it is a substantial portion of their wealth. In addition, housing prices vary considerably, imparting significant changes to housing net worth.

Focusing on real estate has also an additional advantage with respect to studies of stock capital gains. Most surveys on household portfolios only report whether households own stocks and what is their overall amount, but they do not usually provide detailed information on the type of stocks held. Therefore, in order to compute capital gains one has to assume that each household holds the market portfolio and use stock market indexes to compute price changes in individual portfolios. Thus, capital gains vary across households only with their overall level of stockholdings. This is bound to introduce measurement error as, on the contrary, stockholders generally invest in a small number of stocks (e.g. King and Leape, 1998) and individual stock prices vary considerably more than the stock market index. As a 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 not shared by our data on housing prices. We use, in fact, detailed information on housing prices, available for several years and with a fine geographical breakdown. This allows us to match house prices with the household-specific real estate and to compute capital gains and losses at the household level. Thus, capital gains differ across agents both because households differ in the amount of real estate that they own, so that consumers with larger housing wealth are more exposed to house price variation, and because house prices vary across locations and types of estate. The combined time-series and cross-sectional variation in capital gains potentially allows to pin down their effect on individual consumption with greater precision than that allowed by time variation alone in aggregate stock prices.

One important issue when assessing the effect of capital gains on consumption is to distinguish between their effect on consumption at the individual and at the aggregate level. Strong response of individual household consumption to capital gains may be consistent with weak or no response at the aggregate level if capital gains for a group of consumers represent capital losses for another. Take the case of housing: at each point in time not all consumers are homeowners. With limited access to the mortgage market some households are saving to purchase a house in the future. Others, most likely older households, have saved in the past and now own the asset. An increase in the relative price of housing causes

an increase in the wealth of homeowners that may translate in higher consumption. It may however result in lower consumption for current home-renters, but potential home-buyers, as they now need more money to become homeowners. Reliance on aggregate time series to detect an effect of capital gains on consumption clearly fails to assess heterogeneous responses by different groups of households to the same asset price movement and may lead to the wrong conclusion that consumption does not, or weakly, respond to capital gains. In particular, if aggregate consumption were found not to respond to capital gains, it would not be possible to assess whether this would be the result of consumers not changing their expenditures when faced with changes in the market value of their wealth holdings, or because of heterogeneous responses that cancel out in the aggregate. With micro data we can directly address this issue.

One of the main findings of this paper is that, considering the entire sample of households, they raise their consumption by slightly more than 2 cents for each euro of capital gains on housing. However, responses differ among owners and renters: while homeowners increase consumption with a marginal propensity to consume out of real value changes in housing wealth that is close to 0.035, in line with the evidence from other studies for the United States and the United Kingdom, renters, if anything, appear to decrease it, counteracting the effect on aggregate consumption, even if their response cannot be estimated with statistical precision.

The rest of the paper is organized as follows. Section 2 reviews the empirical literature on consumption and capital gains. Section 3 describes the data and the procedure used to compute the capital gains. Section 4 outlines the general model that guides us in our empirical analysis and Section 5 shows the main empirical results. Section 6 extends the estimates in various directions. Section 7 summarizes and concludes.

2. Literature Review

Most recent empirical research on the link between wealth and consumption has found evidence of a positive and significant long-run relationship between the two variables. Indeed, budget constraints imply that an increase in household wealth must eventually raise its expenditure. The “direct” consumption response might be more or less rapid depending on the uncertainty about the permanence of the asset price change and more or less strong

depending on the (real or perceived) accessibility to the asset in question, which could be held to provide for retirement, bequest, or other motives.

A positive relationship between wealth and consumption might also arise if changes in asset prices are considered helpful to predict changes in future income. As this effect may also account for the changes in the marginal propensity to consume out of wealth on the part of those who do not own the particular assets to which the price changes refer, it is often referred to, in the more recent literature, as the "indirect channel". More generally, an asset price effect on consumption was also early derived within the theoretical framework of the life cycle hypothesis. In the words of Franco Modigliani (1975, p. 15), long-term changes in the real rates of return of net assets would affect "the life profile of consumption both through an income effect, tending to raise consumption at all ages, and a substitution effect tending to shift consumption away from the present and towards a later age. […] Unfortunately there is no way to establish *a priori* just how strong the substitution effect might be in reality". In principle, then, rather than guessing at how capital gains and losses might "indirectly" affect the propensity to consume, an attempt at directly estimating their effect on consumption would be possible if data on household asset price changes were available. One should expect that the higher the income effect with respect to the substitution effect, the larger would be the response of consumption to asset price changes (perceived to last).[4]

To disentangle all these effects household-level data are needed. Based on the *US Survey of Consumer Finances*, Poterba and Samwick (1995) highlight the case for an indirect channel (if any) by finding very limited correlation between stock prices and expenditure on luxury goods, which are consumed disproportionately by higher-income, stockholding households and whose share in total consumption should therefore increase in the wake of rising stock prices. Stockholders' spending appears to be only modestly affected

[4] For an early extension in this direction of the time-series estimate of the Ando and Modigliani (1963) consumption function, see Arena (1964). A thorough discussion of the effect on consumption of capital gains and interest rate changes within the life cycle framework is that by Tobin and Dolde (1971), that builds on an earlier contribution by Tobin (1967). In particular, it should be observed that capital gains and losses may be due to changes in relative prices that do not involve interest rate movements, and may give rise to direct income effects on consumption, as well as to changes in the discount rates at which prospective asset earnings are capitalized, and which possibly induce substitution between present and future consumption. Under certain conditions one may argue that the former are more likely in the case of changes in real estate prices and the second may matter more in the case of stock prices.

by changes in wealth also on the basis of the qualitative evidence from the University of Michigan's *SRC Survey of Consumers* reviewed by Starr-McCluer's (2000). Empirical assessments of the Consumption-based Capital Asset Pricing Models (Mankiw and Zeldes, 1991, Attanasio, Banks and Tanner, 2002, Paiella, 2004, Vissing-Jørgensen, 2002, among others), based on household-level data for the United States and the United Kingdom, find instead that stockholders' expenditure is more highly correlated with stock market returns than non-stockholders', which supports the hypothesis of a direct effect. Coherent with this, Maki and Palumbo (2001) find that those households that benefited the most from the recent run-up in equity prices were also the group that substantially decreased their rates of saving. Further, Dynan and Maki (2001) find relatively large direct wealth effects, on the basis of household-specific measures of capital gains. Taken together, these results corroborate a direct view of the stock market wealth effect on consumption.

Even if the stock market wealth effect on consumption is direct, recent research on consumer behavior has suggested many reasons why consumers might increase their spending by less than simple calculations of the marginal propensity to consume over the life cycle may suggest. First of all, equity is held by relatively few, high-income households, which might reduce the aggregate response to this component of households' net worth[5]. Secondly, in the 1990s, there has been in several countries an increase in the importance of equity investment held in retirement accounts. If households develop "mental accounts",[6] that make them more likely to consume wealth held in some ways rather than in others, the marginal propensity to consume out of wealth gains accrued to retirement accounts is likely to be smaller than the marginal propensity to consume out of directly held assets, since the former are often thought of as "long-term assets". Finally, the amount by which capital gains affect spending may well be a function of whether or not the gain has been realized. In principle, unrealized gains can be borrowed against, through, for example, home mortgage refinancing, or could induce households to finance additional expenditure by selling other

[5] Analytic results by Carroll and Kimball (1996) and numerical simulations by Zeldes (1989) show that, when uncertainty is introduced in the life cycle model, the consumption function becomes 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), who estimates the relationship between consumption and liquid assets, and also by Dynan, Skinner and Zeldes (2000), who show that the *average* propensity to consume declines with permanent income.

[6] See Tahler (1990) for details on this view.

assets or by reducing the marginal propensity to save out of current income. However, as long as the gain is not realized, it remains exposed to price uncertainty, which suggests that the propensity to spend out of unrealized gains is likely to be smaller than the propensity to spend out of realized gains. Related to this, it must be remembered that it is only the permanent shocks that matter for consumption decisions. In fact, as consumption is by definition irreversible, it would be unwise to consume this year a gain on an asset that next year may produce a loss.

Also the effect of housing wealth on consumption has been explored in some studies on the basis of data at the household level. Skinner (1996) finds a significant, although small, effect of housing wealth on consumption in the *Panel Study on Income Dynamics* (PSID), whereas Levin (1998) finds essentially no effects in the *Retirement History Survey*. Sheiner (1995) explores the implications of house price increases on PSID renters' savings, but her results are quite inconclusive. Engelhardt (1996) estimates the marginal propensity to consume out of capital gains in owner-occupied housing to be about 0.03 in the PSID, but this comes from an asymmetry in behavioral response, with those experiencing real capital losses reducing their expenditures and those experiencing gains leaving them unmodified. Always on the PSID, Hoynes and McFadden (1997) investigate the link between savings and capital gains in housing and find little evidence of a change in saving behavior in response to expectations about owner-occupied housing, consistent with the hypothesis of mental accounts of Thaler (1990). All these studies based on micro data rely upon owners' estimates of housing values. Although their bias may be small (see Kain and Quigley, 1972, and Goodman and Ittner, 1992), owners' estimates typically have high sampling variances, which leaves much ambiguity in the interpretation of the results. More recently, using individual household data from the *British Household Panel Survey* and changes in market values at county levels, Disney, Henley and Jevons (2003) estimate a marginal propensity to consume out of shocks to housing wealth of around 0.04 to 0.08. Though somewhat different in focus, this study is close in spirit to our own and obtains results broadly similar to ours.

3. Data Sources and Description

Our main data set is obtained from the *Survey of Households Income and Wealth* (SHIW), a large-scale household survey run biannually by the Bank of Italy on a random

sample of about 8,000 Italian households.[7] The survey is available for several years and covers at least two full business cycles with large fluctuations in assets prices; we rely on the 1991, 1993, 1995, 1998, 2000 and 2002 waves whose questionnaire contents, survey methodology and variable definitions are broadly homogeneous. Pooling them together we obtain a sample of over 47,500 records. The survey has a rotating panel component, so that about half of the observations refer to households which have been interviewed in more than one survey. The rotating component could prove useful in eliminating unobserved heterogeneity when studying the dynamics of consumption in response to wealth changes, a feature, however, that we do not exploit in this study.

The SHIW collects detailed information on Italian household income, consumption and wealth, as well as on households' portfolio allocation across financial instruments and their access to formal and informal credit. It has also detailed information on real estate wealth, including year of asset acquisition, size (in square meters) of the house, whether it is the main residence, property status and location. It should be observed that especially on financial wealth the survey participants appear to significantly under-report their assets (see on this issue D'Alessio and Faiella, 2002a). For each household, the Survey also provides information on characteristics of the households' head and each household member, such as education, age, place of birth, and residence. The Appendix contains a more detailed description of the data set and of the variables that we use in our study. Overall, our sample consists of 45,173 observations on 28,825 households.

Table 1 reports summary statistics for our set of data. Panel A shows demographic characteristics in three representative years (1993, 1998 and 2002) for the whole sample, for the sub-sample of real estate holders and for the sub-sample of risky financial assets holders for which capital gains either on real or financial assets are relevant. Real estate includes lands and buildings; risky financial assets are defined as the sum of listed and non listed equity shares, corporate bonds, managed investment accounts, and mutual funds. Characteristics are fairly constant over time, with the exception of the average household size that shrinks somewhat as a consequence of Italy's demographic changes. Differences in

[7] This survey has been widely used in studies on saving behavior by Italian households. See, among others, the essays in the volume edited by Ando, Guiso and Visco (1994), and, for a description and assessment of the survey, Brandolini and Cannari (1994).

characteristics across groups are also stable: while the average real estate holder looks similar to the average sample consumer, the average holder of risky financial assets is definitely more educated, somewhat younger and less likely to live in the South of Italy. Panel B shows median values of consumption expenditure on non-durable goods and services, earnings and asset holdings for the whole sample as well as for the groups of real estate holders and of risky asset holders. As expected, assets holders, particularly those holding risky financial assets, are relatively better off in terms of both earnings and consumption, and wealth. Depending on the year, risky assets holders are between two and three times wealthier than the median sample consumer.

In order to compute capital gains on real estate holdings we merge the household data with data on house prices taken from a database collected since 1965 by *Il Consulente Immobiliare*, a publication edited by *Il Sole 24ore*.[8] The data are collected twice a year at the province level[9] and report the average price per square meter of new or recently renovated dwellings located in three different areas: central city, semi-central area and the outskirts. Clearly, levels differ depending on the city location, although the dynamics of prices within a given province – which is what is relevant for computing capital gains – is fairly similar. For our analysis we merge the data using the code of the province where the household lives. Besides house prices, in order to compute capital gains on equity we merge the household data also with data on an aggregate price index of the shares listed on the Italian Stock Exchange.[10]

Table 2 shows summary statistics for the dynamics of asset prices in the survey years, separately for financial assets and housing. 1993 and 1998 are years of strong capital gains on stocks, while year 2002 sees substantial capital losses. House price dynamics are reported separately for three geographical areas; clearly, house prices tend to co-move, driven by the business cycles. Yet, there are differences in the size of the price changes across areas, reflecting local factors. Furthermore, it turns out that house prices are not necessarily

[8] *Il Sole 24ore* is the most widely read Italian financial newspaper. *Il Consulente Immobiliare* is targeted to real estate agents and intends to provide a benchmark for real estate evaluation.

[9] Italy's territory is divided into 20 regions and each region is divided into provinces whose size is about that of a US county. The number of provinces has been evolving over time; they were 95 at the beginning of the 1990s and have increased to 103 at the end of the past decade.

[10] The data source is Bank of Italy up to 1993 and Morgan Stanley (MSCI Italy) after then.

synchronized with stock prices. For instance, in 1998, while the stock market was booming, house prices were flat. House price changes are averages of changes across provinces. As the high standard errors reported in brackets show, there is considerable dispersion in house price dynamics across local markets. Figure 1 shows the distribution across provinces of house price changes in the years covered in our data set: it is clear that there is considerable geographical variation both in sign and size. Thus, while stock prices vary only at the aggregate level and we cannot account for differences in the valuation of individual portfolios as no information is available on the specific stocks held by households, the data on house prices vary over time, over space (across the Italian provinces) and across the location of the house (central versus semi-central versus outskirts). Accordingly, for the latter there is considerable variation and thus ample possibilities of identifying wealth effects, if present.

3.1 Computing capital gains

Survey information on assets held and their value is reported as of the end of the year of interview. To obtain an estimate of the total net wealth as of the beginning of the year, we subtract household savings – computed as difference between disposable income and consumption expenditures – from household end-of-period reported net worth. To recover beginning-of-period net real and financial wealth we assume that household savings are distributed between financial and real assets as in the national accounts of the corresponding year. All these beginning-of-period wealth measures are inclusive of capital gains/losses. To disentangle the latter, we assume that they accrue only on real estate (lands and buildings) and on listed stocks. We also assume that the real estate share of real assets and the stock share of financial assets at the beginning of the year are the same as those at the end of the year. Using the year percentage change in the price of the relevant asset, net of the change in consumer prices, we can then recover the real gain/loss on the asset of interest.

Table 3 reports summary statistics on capital gains by type of asset and year. The table also reports the fraction of households that invest in the asset in our sample. Clearly, capital gains are measured with reference to the holders of the specific asset. While about 70 percent of households hold real estate (67 percent in 1991 and 73 percent in 2002), only a minority has risky financial assets, though participation has been markedly increasing over the 1990s with the spreading of the “equity culture”. In fact the fraction of households with risky assets

has risen from 6 percent in 1991 to about 21 ten years later and that of stockholders from to 2 to 8 percent (last rows). Average capital gains/losses reflect both the change in the price of the asset and the initial amount of the asset held among holders. In the aggregate, also the extensive margins – that is the fraction of consumers that have the asset in their portfolio – matter: clearly, assets that are held by a minority of consumers are unlikely to have large effects on aggregate consumption. In this respect, the table makes clear that focusing on real estate rather than on stocks may be more important, at least when considering the Italian experience. The median value of capital gains on housing in 1991 is 4,200 euros and 8,900 euros in 2002 (all at 2002 prices), about 17 percent and 34 percent of median household earnings, respectively. In 1993 and 1995 the median household incurred capital losses on real estate, amounting to 2,700 and 4,300 euros, respectively 12 percent and 18 percent of its earnings. As to financial assets, we compute both the gains on the stock of risky assets, assuming that the prices of all risky securities vary proportionally to our stock market index, and the gains on listed stocks, which are a subset of the risky asset holdings. The capital gains on risky financial assets have peaks in 1993 and 1998 with median value among asset holders of 9,200 and 9,800 euros, respectively 25 percent and 29 percent of those years' household earnings; in 2002 the median capital loss of 5,400 euros amounts to about 14 percent of earnings. The gains on listed stocks range from 7 percent of earnings in 1998 to -6 percent in 2002. The actual gains/losses can be expected to fall somewhere in between as Italian households hold relatively large amounts of mutual funds (mutual funds accounted for almost 40 percent of risky financial assets in 2002), whose composition is not reported and which here we classify as risky assets.

The size of these fluctuations in asset values is remarkable and may potentially translate into large changes in consumption if consumers react to them. Although, as noted earlier, house prices co-move, there are significant geographical differences in house price dynamics in response to local shocks. Thus, as illustrated in Figure 1 there are locations where house prices decline even in years when on average they increase. As a consequence, in the same year some households may enjoy capital gains and other incur capital losses on their real estate: this is a further reason why aggregate data may conceal significant consumption responses to capital gains. Table 4 shows the fraction of "losers" (those facing a decline in the value of the asset) and "gainers" (those facing an increase) for each sample year. Interestingly, even in years when the average house prices increase significantly, as in 2002,

there is a non negligible fraction of households who lose (9 percent).

4. The Model

We estimate a simple consumption function based on a general version of a life cycle-permanent income model, where rational, utility-maximizing agents optimally allocate their resources to consumption over their entire life.[11] In this instance, consumer decisions are conditional on human wealth (which may be assumed to be roughly proportional to labor and other non-asset income) and on non-human (real and financial) wealth and the equilibrium behavior of consumers can be described using the following:

$$(1) \qquad \frac{c_{h,t}}{y_{h,t}} = b_0 + b_1 \frac{p^w_{h,t} w_{h,t}}{y_{h,t}} + b_2 \frac{cg_{h,t+1}}{y_{h,t}} + e_{h,t},$$

where $c_{h,t}$, $y_{h,t}$, and $p^w_{h,t} w_{h,t}$ are household h non-durable consumption and non-asset income over the t^{th} year and beginning-of-year wealth (valued at beginning-of-year prices). $cg_{h,t+1}$ denotes the real capital gain/loss accrued over the year on beginning-of-period wealth and is defined as: $cg_{h,t+1} = p^w_{h,t} w_{h,t} \left(\frac{p^w_{h,t+1} - p^c_{t+1}}{1 + p^c_{t+1}} \right)$, with $p^w_{h,t+1}$ and p^c_{t+1} denoting the changes in asset prices and in consumer prices, respectively. $e_{h,t}$ captures unobservable heterogeneity in consumption, relative to income.

In practice, in the estimation of the marginal propensities to consume out of wealth and out of capital gains/losses, we distinguish between real and financial assets and consider only the gains/losses accrued on real estate (lands and buildings) and on stock holdings. We also take into account household heterogeneity by including a set of household socio-demographic variables that allow for differences in the marginal propensity to consume out of income. In principle, any heterogeneity in the marginal propensities to consume out of wealth and out of capital gains, for which we do not control, will also end up being captured by these variables. However, including a full set of controls and allowing explicitly for heterogeneity in the marginal propensities to consume out of wealth and capital gains does

[11] While there are well known differences, though much less than similarities, between the life cycle and the permanent income theories of consumption behavior, they are not relevant at the level of generality considered in this study. For a thoughtful discussion of empirical evidence on the life cycle hypothesis, see Ando (1988).

not change our results in any way.[12]

5. Entire Sample Result

Table 5 shows the results of our basic OLS estimate. Standard errors have been corrected to account for heteroskedasticity using White's (1980) estimator of the covariance matrix. The left-hand side is the ratio of consumption to non-asset earnings (mostly labor income). Therefore, also the right-hand side variables measuring household net assets or capital gains/losses are all scaled by household earnings. The first column reports a simple regression where the consumption-income ratio is regressed on the net worth-income ratio only. Wealth is measured as of beginning of period and therefore does not include capital gains/losses accrued to real estate and stocks. This regression is meant to give an idea of the size of the marginal propensities to consume out of wealth and out of labor income, the latter being measured by the regression's constant. The marginal propensity to consume out of household wealth is 0.02 and is highly statistically significant. The marginal propensity to consume out of labor income is about 0.71 and is also estimated with high precision. Both marginal propensities are consistent with the predictions of a standard Ando-Modigliani life cycle model, on which this specification is based, even if the former is on the low side and the latter on the high side of the spectrum of the estimates generally found in the literature. In particular, the latter result is indicative of the possible presence of non-negligible liquidity constraints for a relevant fraction of the households included in our sample.

The second column adds to the specification a number of demographic characteristics, including age, gender, job status and type, and location – all referred to the household's head. These controls are meant to capture life cycle effects on the propensity to consume, as well as preference heterogeneity across consumers which may be correlated with demographics. We also control for family size, to account for scale economies in consumption. To capture business cycle effects we include a set of year dummies. The way control variables are introduced implies that they affect primarily the marginal propensity to consume out of labor income, since they shift the regression's constant. As a consequence, the marginal propensity to consume out of income is now household specific, with a mean of

[12] The regressions are available upon request.

0.70 and a standard deviation of 0.14. The estimated marginal propensity to consume out of wealth is 0.021. Both estimates are very close to those in the first column.

The third column adds to the regressions the capital gains and losses on real estate while controlling for beginning-of-period wealth. The marginal propensity to consume out of a capital gain on real estate is 0.019, only sligthly smaller than the marginal propensity to consume out of total beginning-of-period wealth. The parameter is precisely estimated and we reject the hypothesis that is equal to zero. Yet, these estimates are run on the total sample which includes both holders and non-holders of real estate. If wealth effects are direct, they apply only to the former and including the latter may bias the estimates against finding an effect. Thus, in the fourth column we re-run the regression on the sample of households who hold real estate (land or buildings), which leaves us with 32,325 observations. Capital gains have now a larger positive and significant effect on consumption: one euro of increase in real estate value raises consumption by 2.8 cents. This estimate is similar to the one obtained by Engelhardt (1996) for the United States, though in the latter case it came out from an asymmetry in behavioral response, with those experiencing losses reducing their expenditure and those experiencing gains leaving it unmodified. It is also similar to, though a bit lower than, the estimate obtained by Disney, Henley and Jevons (2003) for the United Kingdom, who find a stronger response in periods of house price increase and a substantially higher marginal propensity to consume from real housing gains on the part of households with initial negative equity.

Since in the presence of liquidity constraints the marginal propensity to consume out of different forms of wealth may differ, the last two columns decompose wealth into real and financial. Indeed, we find that the marginal propensity to consume out of financial wealth is about twice that out of real assets (0.038 compared to 0.016, columns 5 and 6).[13] Disentangling the capital gains on real estate results in an estimated capital gain effect of 0.016, which is statistically significant. In sum, these estimates suggest that consumers do adjust consumption to perceived capital gains and losses on real estate. In the aggregate the response is by far smaller than that to one additional euro of labor and other non asset incomes, as it should be. The latter (a flow) is in fact included in the regression as a proxy of

[13] As we noticed, however, financial wealth, and in particular the holdings of risky financial assets, is underestimated in the SHIW and this might induce an upper bias in the estimate of the relevant propensity.

the expected life-time earnings (a stock), a multiple, for the average household, of current earnings. This explains, in good substance, the difference between the propensities out of labor income and out of net housing and financial assets. In the case of capital gains, instead, we may conclude with Arena (1964, p. 109), ignoring possible substitution effects unlikely to affect the response to housing price changes, that "unanticipated gains have a 'one-shot' effect to be spread over the remaining life of the individual. They become part of net worth in future periods and therefore affect consumption in the same way as initial net worth …". Indeed, the marginal propensities to consume out of net assets and value changes of real estate are in our estimates of a comparable order of magnitude. Overall, the coefficients are somewhat on the low side, which may in part reflect the fact that our wealth variable is dominated by housing and the latter should only partly be considered, for those who live in the homes they own, as life cycle wealth. Also, a low wealth coefficient may be due to somewhat strong bequest motives that seem to play a significant role in Italy in the accumulation of wealth.[14]

6. Homeowners, Home-Renters and Owners of Risky Financial Assets

So far in computing capital gains on real estate we have assumed that prices of second houses and land vary as the average house price of the province where the household lives. While it is likely that land prices are correlated with house prices, the correspondence is not necessarily one to one.[15] Strictly speaking our data apply well to homeowners. In this section we discuss results related respectively to the consumption decisions of homeowners and home-renters. We also briefly consider some evidence on the impact of changes in stock prices for the limited fraction of households that own risky financial assets.

6.1 The effect of house prices on homeowners' consumption

In Table 6 we report estimates based on the sample of 29,435 homeowners. They are obviously a sub-sample of real estate owners, as the latter may include renters that own for

[14] See, for instance, Barca, Cannari and Guiso (1994).

[15] Furthermore, the analysis relies on the assumption that the prices of the land and buildings other than the household's home vary as the prices of the dwellings of the province where the household resides, which needs

instance a piece of land. The household's home is priced based on the province and on its location within the province (central or semi-central location or outskirts). For the other real estate, we keep using the average provincial price. When estimates are conducted on this sub-sample, we find that the marginal propensity to consume out of wealth is 0.019 (first and second column), slightly smaller than the one that we obtain when estimates are done on the sample of real estate holders, while the estimated effect of capital gains on expenditure is 0.033. The marginal propensity to consume out of income is in the aggregate about 0.62, lower than for the entire sample. This would suggest that liquidity constraints are smaller for those who own the house where they live, which would seem to be a reasonable conclusion.

In the last column of Table 6 we distinguish between real and financial wealth. Homeowners' marginal propensity to consume out of financial wealth turns out to be substantially smaller than the marginal propensity for the sample as a whole, reported in the last column of Table 5. Furthermore, and in contrast with the evidence of Table 5, it is slightly smaller than their marginal propensity to consume out of real assets, although we cannot reject the hypothesis that the coefficients are equal. It would thus seem that those who only own their savings in the form of (possibly non risky) financial assets (such as bank and postal deposits or government bonds), being more liquidity constrained, should have higher propensities to consume out of these assets and of labor income. That this is the case is shown in the estimates of the consumption decisions of those who do not own real estate, which we now discuss.

6.2 The effect of house prices on renters' consumption

As said, changes in house prices may have heterogeneous effects on different groups of consumers. While owners may feel richer when house prices increase, renters who are saving to buy a house will feel poorer, as the purchasing power of their accumulated savings in units of houses declines with the price of housing. After the price increase, if renters do not give up their plans to become owners, they will need to save more and thus will compress current consumption. As a consequence, if present, this effect will weaken the effect of capital gains on aggregate expenditure caused by any positive effect on the

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not be the case. However, there is no information as to the location of land and other buildings, with the exception of the 2002 survey that reports for the latter the region of location.

consumption of homeowners. We test this possibility in Table 7 where we report various estimates of the consumption equation for the group of renters. The first two columns focus on the sample of renters that have no real estate, which is the vast majority of renters (9,563 out of a total of 10,894). In the regressions we include the house price change in the province where the consumer lives, while controlling for year effects. Consequently, the identification of the effects of house price changes on renters' behavior stems from province-specific changes in house prices. As the estimates in the second column show, housing price increases have a negative effect on renters' consumption, though this coefficient estimate lacks statistical precision. Notice that, in accordance with our previous conclusion with respect to liquidity constraints, renters' marginal propensities to consume out of both wealth and income are substantially larger than those of homeowners and also of renters who own other real estate (last two columns of Table 7).

For the sample of renters who own other real estate the implications of house price changes are in principle less clear-cut. In fact, on the one hand, these households enjoy a gain on their real estate which may boost their consumption, on the other they still may suffer a loss if they are planning to buy a home. Thus, the overall effect of house price changes on this group is ambiguous. Columns 3 and 4 report consumption regressions for renters with other real estate, the latter including as an explanatory variable the estimate of the capital gain on their real estate. Though negative, also the estimate of the effect of house price dynamics on consumption for this group come with a rather large standard error.

6.3 The reaction of consumption to capital gains on risky financial assets

To complete the evidence on the reaction of consumption to capital gains we have also computed capital gains on financial assets. As mentioned before, we have no information on the specific assets held in households' portfolios. To estimate household level capital gains on stocks, we assume that all listed equity moves as the stock market index, which is probably a source of measurement error in the estimated gains and losses, something that needs to be kept in mind when interpreting the results. Table 8 shows the results. The first two columns report regressions on the group of households that have neither stocks, nor other risky financial assets, such as bonds or mutual funds whose returns might be at least to some extent correlated to the return on stocks. If stock market effects are mainly direct, for this group stock market movements should not matter. Yet, as we see from the second

column estimates, changes in the price index have a positive effect on their consumption. However, the coefficient may at least partly be capturing the correlation of the stock market with the business cycle, as this regression omits time dummies, which cannot be identified separately from stock price changes. Furthermore, the introduction of this variable also conflicts with the estimation of the response of consumption to capital gains and losses in real estate, especially so as independent cyclical effects are not identifiable.

The last three columns of the table focus on holders of risky financial assets. Overall capital gains on these assets seem to have a modest effect on consumption both from a statistical and an economic perspective. For the group of risky asset holders (third column), which includes also households who do not own stocks, the stock market index has a negative and significant sign, which may seem a puzzling result. However, equity price changes are most likely related to changes in interest rates, and this result might indicate that the substitution effect dominates in this case the income effect, a possibility suggested by Tobin (1967) and Tobin and Dolde (1971). When estimates are conducted on the (very small) group of stock holders (columns 4 and 5), the coefficient on the capital gains is negative but hardly significant. Besides the possibility that the substitution effect might substantially compensate the income effect, one further interpretation might be that consumers do not react to capital gains and losses on financial assets because these gains are highly volatile and consumption is irreversible: today's gains may be easily followed by losses tomorrow and a simple consumption smoothing logic would recommend little or no reaction. Unfortunately, the measurement problems discussed earlier do not allow us to separate this explanation from the competing one that the low estimates may also reflect attenuation bias due to measurement error. As to the marginal propensities to consume out of financial and real wealth and also out of income, the estimates for the risky asset holders turn out to be substantially smaller than those obtained for the sample as a whole. Indeed these consumers are the richest in the sample and the most likely to be very little affected by possible liquidity constraints.

7. Discussion and Conclusions

There are two main results from the estimates of consumers' reaction to capital gains on housing. The first is that Italian households do adjust consumption to changes in the

valuation of their real estate with a response that is of similar size to that obtained in parallel studies for other countries: for the sample of those who own real estate, the marginal propensity to consume out of real value changes of housing wealth turns out to be about 0.035. The second result is that this reaction differs across consumers: when house prices change, what is a potential gain for real estate holders is a potential loss for those who still do not own a house but are saving to buy one. From the point of view of the economy as a whole, the relevant question is how important heterogeneous responses to house price changes are for aggregate consumption. Our estimates allow an answer to this question.

If house prices went up everywhere by 10 percent, for real estate holders the average gain would correspond to about 55 percent of their average annual real income. Based on the coefficients of column 4 in Table 5, their consumption (of non-durables and services) would increase by 2.3 percent (1.5 percent of earnings), that is, on average, 480 euros at 2002 prices (0.28 cents per euro invested in real estate). Considering only the homeowners (that is those households who own the house where they live), we find that their average increase in consumption is close to 3 percent (600 euros), based on the estimates of Table 6 (column 3). For the estimates obtained for the whole sample, however, the increase in consumption would be smaller, about 1 percent, according again to the results of Table 5 (columns 3 and 6). The latter obviously reflect the negative effect of an increase in house prices on renters. Indeed, for renters without any real estate, based on the estimates of column 2 in Table 7, the consumption-to-income ratio would drop by 6.3 percent, which would result in a 1,260 euro reduction in their average consumption, while for renters owning other real estate but not the house where they live the fall in consumption would amount (column 4 of Table 7) to about 2.7 percent (600 euros).

We should remind that in the case of renters the coefficient estimates of capital gains and losses on housing lack precision. However, aggregating these results for renters (23 percent of the sample) to that for homeowners (65 percent of the sample), and attributing no change in consumption to households who do not own nor rent the house where they live, we still get, for a 10 percent house price increase, an overall positive change of 105 euros, about 0.6 percent, in average consumption. On the other hand, given both the limited ownership by Italian households of risky financial assets as well as the insignificance of our empirical estimates, it can be reasonably expected that, somewhat differently than for other countries, the effect of equity price changes on overall consumption would be negligible.

In future work, it would be interesting to allow for different responses of consumption to permanent and transitory shocks to asset prices, on the presumption that only the former would matter for consumption decisions. In fact, as consumption is by definition irreversible, it would be unwise to consume this year a gain on an asset that next year may produce a loss. Our estimates reflect both the willingness of consumers to adjust consumption to variation in wealth as well as the time-series properties of the shocks to wealth valuation. As such, it is uncertain whether and by how much the response that we find may be limited by the presence of transitory shocks to house prices over the sample period. A filtering of transitory from permanent changes in real estate prices might allow to estimate with greater precision the response of consumers' to shocks perceived to be lasting. A further issue worth examining would be that of a possible asymmetric response of consumers to housing wealth losses and gains, as examined for example, with different results, by Engelhardt (1996) and Disney, Henley and Jevons (2003). Finally, in future work full advantage of the panel component of the SHIW, not exploited in this study, might be taken. This may lead to several improvements in the estimation of the effects of capital gains and losses on household expenditures. A crucial one would be that of making possible to model the dynamic response of consumers to shocks in permanent income and wealth. Taking better care of business cycle effects would also allow to estimate with greater precision the equilibrium response of consumption to wealth accumulation and capital gains and losses.

Tables and Figures

Table 1

SUMMARY STATISTICS FOR THE SHIW SAMPLE

A. Household characteristics

	Year								
	1993			1998			2002		
	All	Real estate Holders	Risky asset Holders	All	Real estate Holders	Risky asset Holders	All	Real estate Holders	Risky asset holders
Age	53	53	50	53	54	51	55	56	53
Less than high school*	0.707	0.671	0.384	0.605	0.580	0.370	0.634	0.605	0.391
Household size*	3.025	3.114	3.137	2.978	3.032	2.976	2.716	2.783	2.859
Married*	0.741	0.782	0.843	0.743	0.777	0.801	0.685	0.723	0.782
Self-empl. head*	0.143	0.157	0.250	0.153	0.164	0.212	0.120	0.132	0.184
Not-working	0.449	0.444	0.292	0.447	0.452	0.357	0.532	0.550	0.422
Moved from region of birth*	0.202	0.182	0.193	0.180	0.162	0.178	0.191	0.169	0.197
Living in the South*	0.352	0.355	0.139	0.366	0.363	0.147	0.331	0.321	0.093
No. of obs.	7,730	5,440	753	6,793	4,988	1,374	7,484	5,478	1,556

Note: Real estate includes lands and buildings. Risky assets include stocks, private bonds and mutual funds. * denotes "share of households". Mean values.

B. Household income, consumption and wealth

	Year								
	1993			1998			2002		
	All	Real estate Holders	Risky asset Holders	All	Real estate Holders	Risky asset Holders	All	Real estate holders	Risky asset Holders
Earnings	22,200	26,100	41,200	23,800	26,800	36,300	23,700	27,200	36,700
Expenditure	16,400	18,400	25,500	16,900	18,000	23,800	16,800	18,000	24,000
Net wealth	98,200	147,300	294,000	105,400	145,700	222,800	114,800	162,800	241,300
Real assets	89,300	135,400	239,100	94,100	132,800	173,000	103,000	151,000	200,000
Real estate	-	134,400	-	-	121,900	-	-	150,000	-
Fin. assets	6,600	8,400	50,300	8,500	10,800	37,400	7,500	10,000	35,900
Risky fin. assets	-	-	33,000	-	-	36,500	-	-	20,000

Note: See Note to Panel A for the definitions of real estate and risky assets. Earnings and expenditure (on non-durables and services) refer to the year; the other variables are end-of-year values. Figures are in euros of year 2002. Median values.

Table 2

ASSET PRICES OVER TIME AND ACROSS REGIONS

P(t+1)/P(t)		Year 1991	1993	1995	1998	2000	2002
Stocks:		0.950	1.435	0.945	1.401	1.033	0.775
	North	1.066	1.031	0.996	1.010	1.035	1.084
		(0.110)	(0.070)	(0.095)	(0.048)	(0.058)	(0.064)
Houses:	Center	1.056	0.994	1.007	1.003	1.023	1.085
		(0.088)	(0.095)	(0.101)	(0.087)	(0.070)	(0.056)
	South	1.045	0.966	0.976	1.018	1.047	1.076
		(0.122)	(0.054)	(0.045)	(0.089)	(0.072)	(0.068)
	Italy	1.056	1.000	0.991	1.011	1.037	1.082
		(0.110)	(0.076)	(0.082)	(0.073)	(0.066)	(0.063)

Note: For stocks, the table reports the rate of growth of an index of the shares listed on the Italian Stock Exchange. For houses, the table reports the mean of the rate of growth of the provincial price per square meter and its standard deviation in parentheses. The ratios are at constant prices.

Table 3

CAPITAL GAINS ON HOUSEHOLD ASSETS

	Year 1991	1993	1995	1998	2000	2002
Real estate:						
Share of owners	0.673	0.704	0.716	0.734	0.738	0.732
Capital gains	4,200	-2,700	-4,300	-1,000	1,600	8,900
Capital gains/Earnings	0.170	-0.115	-0.180	-0.041	0.058	0.342
Risky financial assets:						
Share of owners	0.064	0.097	0.113	0.202	0.231	0.208
Capital gains	-900	9,200	-1,300	9,800	1,100	-5,400
Capital gains/Earnings	-0.024	0.245	-0.037	0.285	0.032	-0.142
Listed stock:						
Share of owners	0.018	0.033	0.031	0.077	0.101	0.082
Capital gains	-300	2,600	-400	2,800	300	-2,800
Capital gains/Earnings	-0.007	0.059	-0.012	0.069	0.008	-0.064

Note: The capital gains are computed by multiplying the stock of assets held at the beginning of the year by the change in the asset price over the coming year. See Note to Table 1, Panel A, for the definitions of real estate and risky assets. Figures are in euros of year 2002. Median values.

Table 4

THE LOSERS AND THE GAINERS

	Year 1991	1993	1995	1998	2000	2002
Real estate:						
Share of losers	0.261	0.684	0.710	0.559	0.398	0.085
Share of gainers	0.738	0.316	0.290	0.441	0.602	0.915

Note: Losers and gainers are those real estate owners who recorded a capital loss or a capital gain on their assets, respectively.

Table 5

HOUSEHOLD MARGINAL PROPENSITY TO CONSUME OUT OF WEALTH

	(1) All	(2) All	(3) All	(4) Real estate holders	(5) All	(6) All
(Net wealth)/Y	0.020***	0.021***	0.021***	0.021***		
	(0.002)	(0.003)	(0.003)	(0.002)		
(Net financial. wealth)/Y					0.038***	0.038***
					(0.010)	(0.010)
(Net real wealth)/Y					0.016***	0.016***
					(0.002)	(0.002)
Cap. gains on real estate/Y			0.019***	0.028***		0.016**
			(0.007)	(0.007)		(0.007)
Age/10		-0.118***	-0.119***	-0.024	-0.112***	-0.112***
		(0.023)	(0.022)	(0.015)	(0.022)	(0.022)
Age squared/100		0.002	0.002	-0.002*	0.002	0.002
		(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
High school diploma		-0.094***	-0.095***	-0.073***	-0.092***	-0.093***
		(0.010)	(0.010)	(0.007)	(0.010)	(0.010)
University degree		-0.210***	-0.210***	-0.157***	-0.211***	-0.212***
		(0.012)	(0.012)	(0.009)	(0.013)	(0.013)
Household size		-0.012***	-0.012***	-0.010***	-0.010***	-0.010***
		(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Married		-0.072***	-0.071***	-0.007	-0.069***	-0.069***
		(0.011)	(0.011)	(0.005)	(0.010)	(0.010)
Self-employed head		-0.011	-0.011	-0.032***	0.009	0.008
		(0.013)	(0.013)	(0.012)	(0.011)	(0.011)
Not-working		0.193***	0.192***	0.094***	0.192***	0.192***
		(0.015)	(0.015)	(0.010)	(0.015)	(0.015)
Moved from region of birth		0.066***	0.066***	0.030***	0.062***	0.063***
		(0.010)	(0.010)	(0.006)	(0.009)	(0.009)
Living in the Center		0.036***	0.038***	0.037***	0.040***	0.042***
		(0.008)	(0.008)	(0.005)	(0.008)	(0.008)
Living in the South		0.144***	0.145***	0.106***	0.147***	0.148***
		(0.009)	(0.009)	(0.006)	(0.010)	(0.010)
Year: 1993		0.074***	0.081***	0.032***	0.078***	0.083***
		(0.011)	(0.012)	(0.008)	(0.012)	(0.012)
Year: 1995		0.076***	0.084***	0.061***	0.081***	0.087***
		(0.007)	(0.008)	(0.007)	(0.007)	(0.007)
Year: 1998		0.043***	0.048***	0.015*	0.044***	0.048***
		(0.009)	(0.009)	(0.008)	(0.009)	(0.009)
Year: 2000		0.034***	0.037***	0.012*	0.034***	0.036***
		(0.008)	(0.008)	(0.007)	(0.008)	(0.008)
Year: 2002		0.036***	0.033***	0.013**	0.035***	0.033***
		(0.007)	(0.007)	(0.006)	(0.007)	(0.007)
Constant	0.705***	1.211***	1.208***	0.782***	1.191***	1.189***
	(0.011)	(0.059)	(0.059)	(0.040)	(0.057)	(0.057)
Observations	45,173	45,173	45,173	32,325	45,173	45,173
R-squared	0.057	0.093	0.094	0.215	0.102	0.103
Marginal propensity to consume out of income	*0.705*	*0.698*	*0.697*	*0.603*	*0.713*	*0.712*
	(0.011)	*(0.138)*	*(0.139)*	*(0.083)*	*(0.136)*	*(0.136)*

Note: The left-hand side variable is the ratio of household expenditure on non-durable goods and services to household earnings, denoted by Y. For the construction and definition of variables, see the data appendix. Robust standard errors in parentheses. *significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6

HOMEOWNERS' MARGINAL PROPENSITY TO CONSUME OUT OF WEALTH

	(1) All homeowners	(2) All homeowners	(3) All homeowners
(Net wealth)/Y	0.019***	0.019***	
	(0.002)	(0.002)	
(Net financial wealth)/Y			0.015***
			(0.002)
(Net real wealth)/Y			0.020***
			(0.002)
Cap. gains on real estate/Y		0.033***	0.034***
		(0.007)	(0.007)
Age/10	-0.017	-0.017	-0.016
	(0.012)	(0.012)	(0.012)
Age squared/100	-0.003**	-0.003**	-0.003***
	(0.001)	(0.001)	(0.001)
High school diploma	-0.071***	-0.072***	-0.072***
	(0.007)	(0.007)	(0.007)
University degree	-0.152***	-0.153***	-0.152***
	(0.008)	(0.008)	(0.008)
Household size	-0.012***	-0.012***	-0.012***
	(0.002)	(0.002)	(0.002)
Married	-0.004	-0.003	-0.003
	(0.005)	(0.005)	(0.005)
Self-employed head	-0.027***	-0.028***	-0.032***
	(0.010)	(0.010)	(0.011)
Not-working	0.097***	0.096***	0.096***
	(0.008)	(0.008)	(0.008)
Moved from region of birth	0.024***	0.024***	0.024***
	(0.005)	(0.005)	(0.005)
Living in the Center	0.031***	0.035***	0.034***
	(0.004)	(0.005)	(0.005)
Living in the South	0.102***	0.105***	0.104***
	(0.005)	(0.005)	(0.006)
Year: 1993	0.013**	0.030***	0.029***
	(0.006)	(0.007)	(0.007)
Year: 1995	0.039***	0.058***	0.058***
	(0.006)	(0.007)	(0.007)
Year: 1998	0.001	0.013*	0.013*
	(0.007)	(0.008)	(0.008)
Year: 2000	0.007	0.014**	0.015**
	(0.006)	(0.006)	(0.006)
Year: 2002	0.019***	0.014**	0.014**
	(0.006)	(0.006)	(0.006)
Constant	0.786***	0.773***	0.767***
	(0.032)	(0.032)	(0.032)
Observations	29,435	29,435	29,435
R-squared	0.208	0.212	0.213
Marginal propensity to consume out of income	*0.617*	*0.614*	*0.619*
	(0.080)	*(0.082)*	*(0.081)*

Note: See Note to Table 5 for the definition of variables. Robust standard errors in parentheses.
*significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7

RENTERS' MARGINAL PROPENSITY TO CONSUME OUT OF WEALTH

	(1) No other real estate	(2) No other real estate	(3) Owners of other real estate	(4) Owners of other real estate
(Net wealth)/Y	0.062**	0.062**	0.035***	0.035***
	(0.027)	(0.027)	(0.009)	(0.009)
P^H_{t+1}/ P^H_t		-0.063		
		(0.067)		
Cap. gains on real estate/Y				-0.084
				(0.091)
Age/10	-0.049	-0.048	-0.188	-0.184
	(0.071)	(0.071)	(0.207)	(0.203)
Age squared/100	-0.008	-0.008	0.010	0.009
	(0.007)	(0.007)	(0.018)	(0.017)
High school diploma	-0.068**	-0.068**	-0.110***	-0.111**
	(0.030)	(0.030)	(0.041)	(0.042)
University degree	-0.152***	-0.152***	-0.223***	-0.228***
	(0.037)	(0.037)	(0.045)	(0.045)
Household size	-0.013*	-0.013*	-0.005	-0.005
	(0.008)	(0.008)	(0.016)	(0.016)
Married	-0.120***	-0.120***	-0.044	-0.048
	(0.034)	(0.034)	(0.056)	(0.057)
Self-employed head	0.038	0.039	-0.071	-0.069
	(0.066)	(0.066)	(0.050)	(0.051)
Not-working	0.339***	0.339***	0.172**	0.174**
	(0.051)	(0.051)	(0.075)	(0.077)
Moved from region of birth	0.062**	0.062**	0.027	0.028
	(0.029)	(0.029)	(0.050)	(0.050)
Living in the Center	0.109***	0.108***	0.081	0.073
	(0.036)	(0.036)	(0.057)	(0.051)
Living in the South	0.224***	0.223***	0.078*	0.071
	(0.032)	(0.032)	(0.043)	(0.043)
Year: 1993	0.220***	0.211***	0.096**	0.071
	(0.038)	(0.039)	(0.045)	(0.041)
Year: 1995	0.165***	0.156***	0.075**	0.049
	(0.020)	(0.024)	(0.032)	(0.044)
Year: 1998	0.152***	0.143***	0.065*	0.043
	(0.032)	(0.034)	(0.036)	(0.045)
Year: 2000	0.150***	0.143***	0.044	0.032
	(0.030)	(0.031)	(0.045)	(0.052)
Year: 2002	0.087***	0.085***	0.035	0.036
	(0.028)	(0.029)	(0.035)	(0.034)
Constant	1.129***	1.198***	1.335**	1.356**
	(0.168)	(0.181)	(0.554)	(0.565)
Observations	9,563	9,563	1,331	1,331
R-squared	0.114	0.114	0.260	0.263
Marginal propensity to consume out of income	*0.905*	*0.905*	*0.651*	*0.655*
	(0.202)	*(0.202)*	*(0.131)*	*(0.136)*

Note: See Note to Table 5 for the definition of variables (P^H is the per-square meter house price). Robust standard errors in parentheses. *significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8

THE MARGINAL PROPENSITY TO CONSUME OUT OF FINANCIAL WEALTH

	(1) No risky financial assets	(2) No risky financial assets	(3) Owners of risky fin. assets	(4) Owners of listed stocks	(5) Owners of listed stocks and real estate
(Net financial wealth)/Y	0.026***	0.026***	0.028***	0.026***	0.021***
	(0.008)	(0.008)	(0.010)	(0.006)	(0.005)
(Net real wealth)/Y	0.019***	0.019***	0.007***	0.007***	0.007***
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
P^S_{t+1}/ P^S_t		0.052***	-0.056***		
		(0.015)	(0.017)		
Cap. gains on stocks/Y				-0.043	-0.084*
				(0.054)	(0.047)
Cap. gains on real estate/Y		-0.006	-0.006	0.016	0.022*
		(0.007)	(0.008)	(0.012)	(0.012)
Age/10	-0.106***	-0.105***	0.020	0.041	0.049
	(0.025)	(0.026)	(0.021)	(0.037)	(0.039)
Age squared/100	0.004*	0.004*	-0.005**	-0.007*	-0.007*
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
High school diploma	-0.050***	-0.049***	-0.050***	-0.040*	-0.037
	(0.008)	(0.008)	(0.016)	(0.022)	(0.024)
University degree	-0.142***	-0.142***	-0.113***	-0.110***	-0.107***
	(0.011)	(0.011)	(0.020)	(0.027)	(0.026)
Household size	-0.017***	-0.017***	-0.006*	-0.004	0.001
	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)
Married	-0.038***	-0.038***	-0.028**	-0.037	-0.017
	(0.009)	(0.009)	(0.013)	(0.024)	(0.019)
Self-employed head	0.017	0.017	-0.019*	-0.003	-0.024
	(0.013)	(0.013)	(0.011)	(0.020)	(0.015)
Not-working	0.129***	0.132***	0.056***	0.062***	0.056***
	(0.018)	(0.018)	(0.011)	(0.017)	(0.017)
Moved from region of birth	0.053***	0.053***	0.037***	0.033**	0.023
	(0.011)	(0.011)	(0.010)	(0.016)	(0.015)
Living in the Center	0.025**	0.024**	0.041***	0.066***	0.061***
	(0.011)	(0.011)	(0.010)	(0.017)	(0.016)
Living in the South	0.067***	0.065***	0.019	0.034	0.017
	(0.007)	(0.007)	(0.014)	(0.027)	(0.015)
Year: 1993	0.063***			0.013	0.010
	(0.011)			(0.021)	(0.022)
Year: 1995	0.066***			0.078***	0.076***
	(0.006)			(0.023)	(0.024)
Year: 1998	0.043***			0.023	0.035*
	(0.009)			(0.020)	(0.020)
Year: 2000	0.040***			0.051**	0.034*
	(0.010)			(0.021)	(0.019)
Year: 2002	0.013*			0.024	0.016
	(0.007)			(0.017)	(0.017)
Constant	1.116***	1.094***	0.770***	0.597***	0.543***
	(0.068)	(0.069)	(0.053)	(0.093)	(0.095)

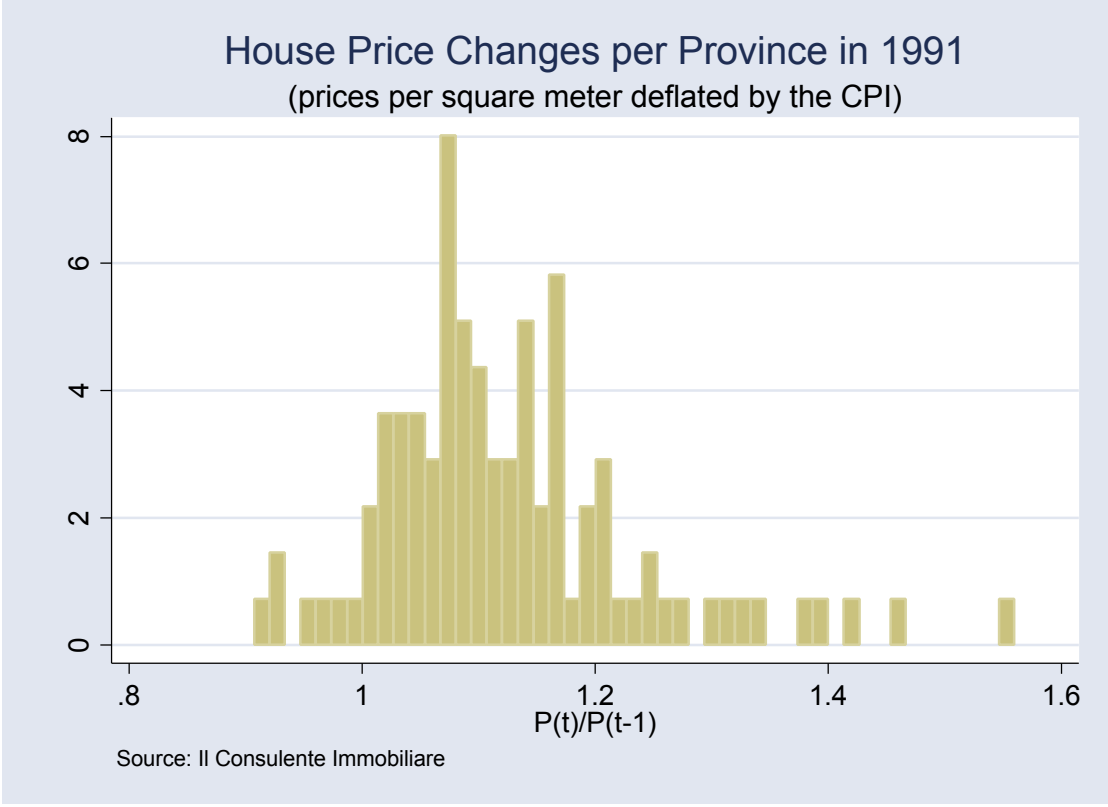
[Table 8 continued]

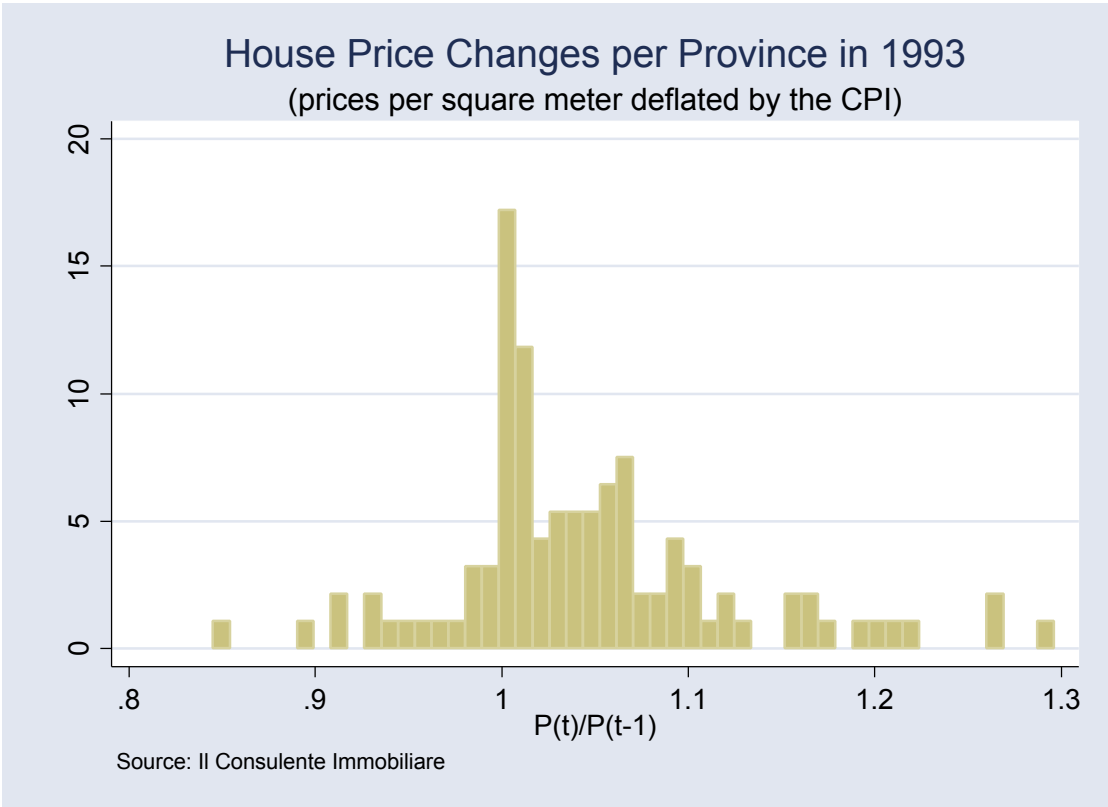
Observations	30,879	30,879	6,810	2,528	2,252
R-squared	0.108	0.107	0.173	0.162	0.220
Marginal propensity to consume out of income	*0.685* *(0.088)*	*0.685* *(0.085)*	*0.619* *(0.052)*	*0.604* *(0.0609)*	*0.592* *(0.056)*

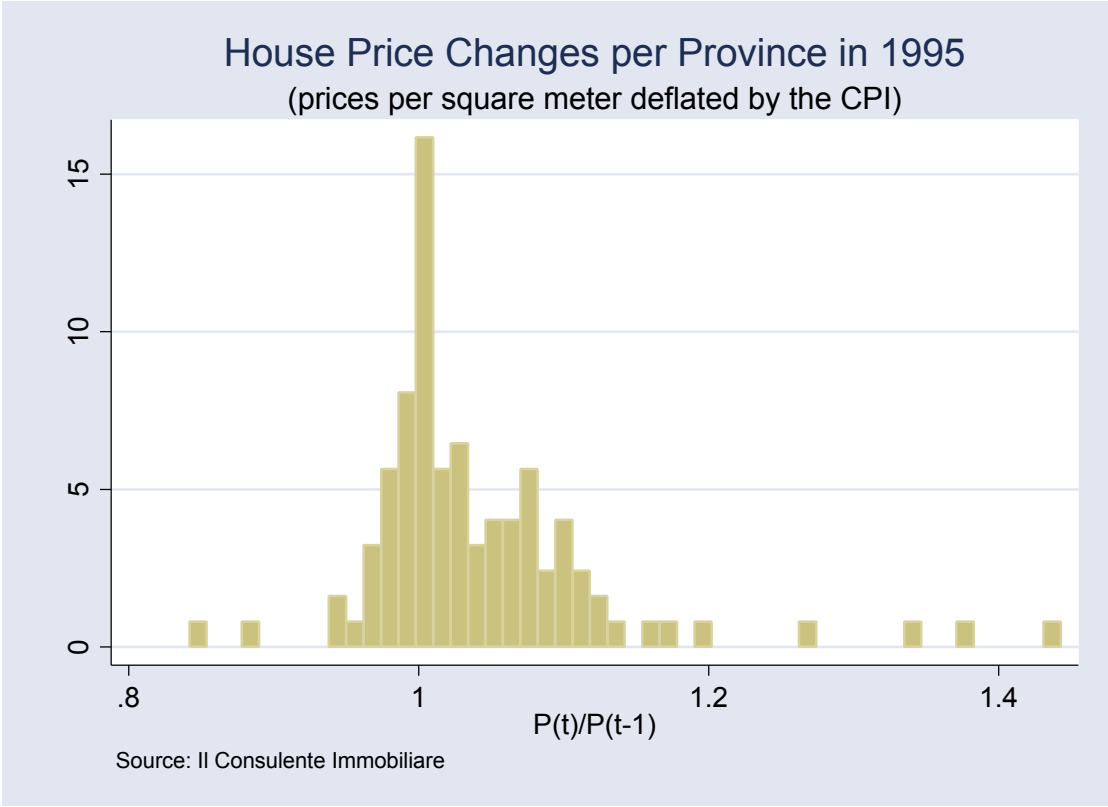
Note: See Note to Table 5 for the definition of variables (P^S is the stock price index). Robust standard errors in parentheses. *significant at 10%; ** significant at 5%; *** significant at 1%.

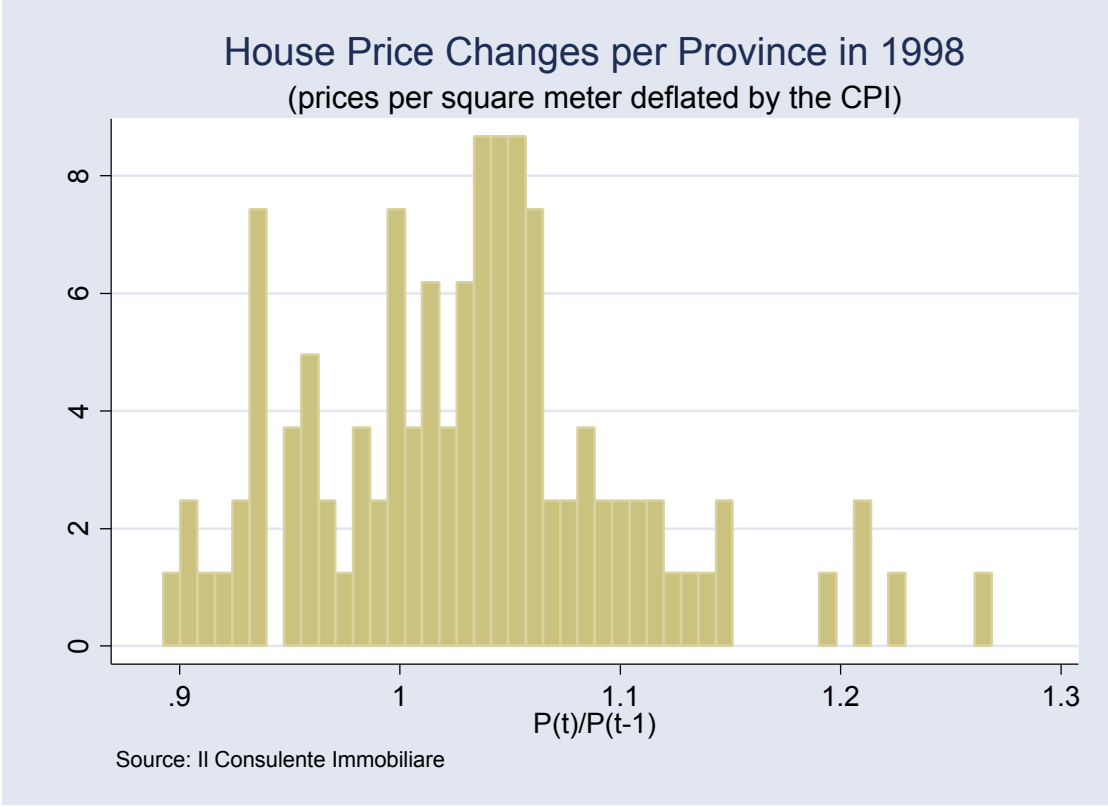
Figure 1

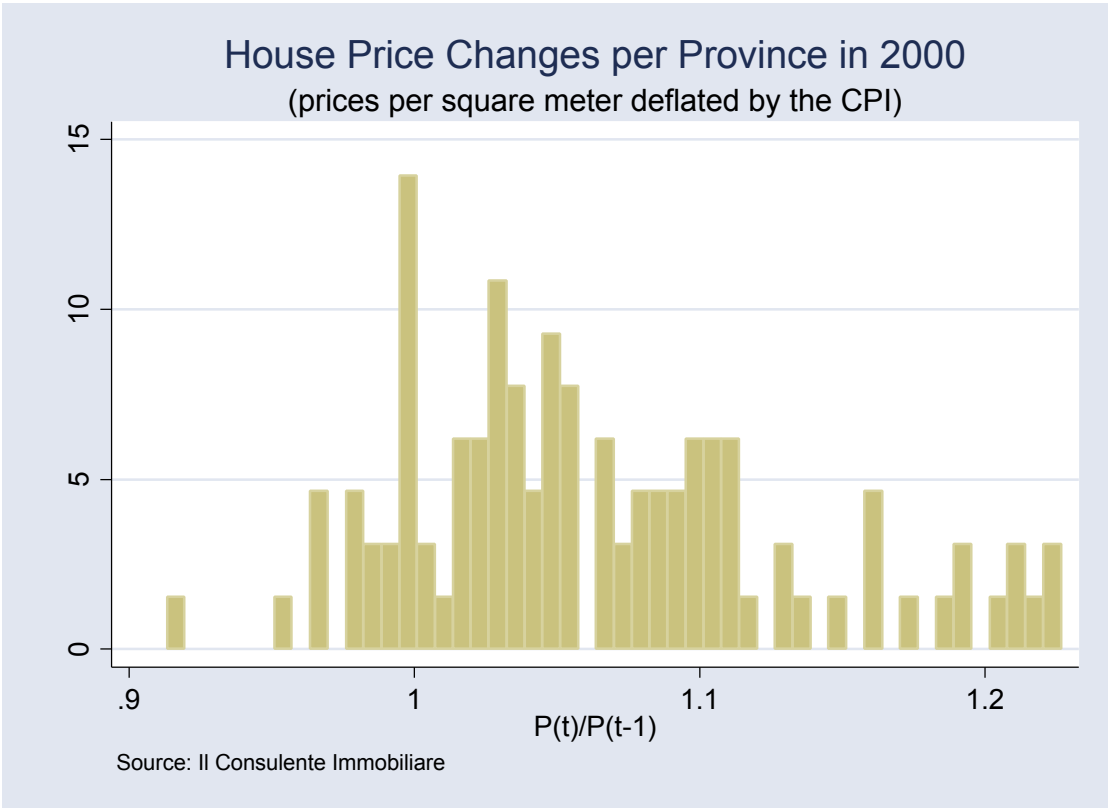
THE DISTRIBUTIONS OF HOUSE PRICE DYNAMICS ACROSS PROVINCES

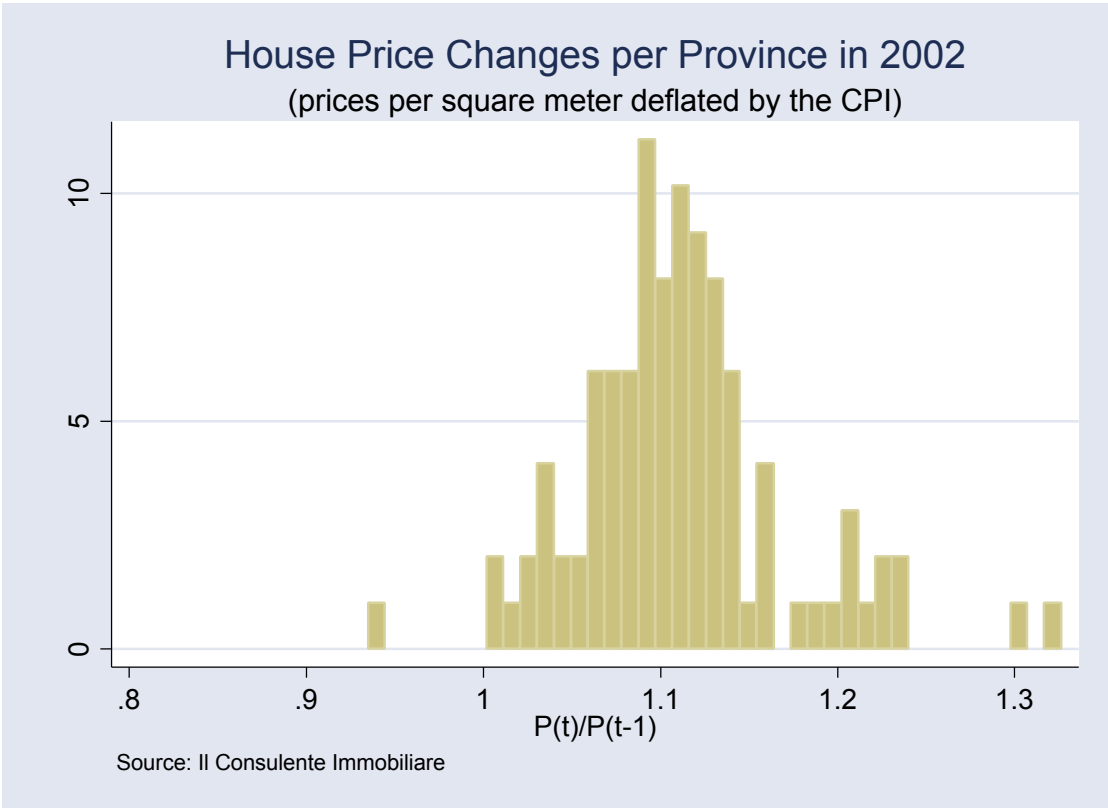





House Price Changes per Province in 1995
(prices per square meter deflated by the CPI)
0
5
10
15
.8
1
1.2
1.4
P(t)/P(t-1)
Source: Il Consulente Immobiliare


House Price Changes per Province in 1998
(prices per square meter deflated by the CPI)
0
2
4
6
8
.9
1
1.1
1.2
1.3
P(t)/P(t-1)
Source: Il Consulente Immobiliare


House Price Changes per Province in 2000
(prices per square meter deflated by the CPI)
0
5
10
15
.9
1
1.1
1.2
P(t)/P(t-1)
Source: Il Consulente Immobiliare


House Price Changes per Province in 2002
(prices per square meter deflated by the CPI)
0
5
10
.8
.9
1
1.1
1.2
1.3
P(t)/P(t-1)
Source: Il Consulente Immobiliare

Appendix

Data sources

Our main source of data is the Bank of Italy *Survey of Household Income and Wealth* (SHIW), which is a representative sample of the Italian resident population and provides detailed data on household demographic characteristics, consumption, income and balance sheet items. The survey was first run in the mid-1960s but has been available on tape only since 1984. Over time, it has gone through a number of changes in sample size and design, sampling methodology and questionnaire.

For our analysis, we consider the last six surveys of data covering the period 1991-2002, which are broadly homogeneous as to the sampling methodology, the sample size and the contents of the information collected. Over the period considered, the Survey is biannual (with the exception of the 1998 wave which was run three years after the previous one) and covers about 8,000 households per set of interviews. For an exhaustive description of the data, of the sampling methods and issues, see D'Alessio (1993, 1995 and 1997), D'Alessio and Faiella (2000 and 2002) and D'Alessio, Faiella and Neri (2004).

House prices are taken from *Il Consulente Immobilare* (by *Il Sole24Ore*), which collects per-square meter prices of newly-built or recently-renovated houses twice a year. Price data are at provincial level and, for each province, the prices of houses located in the center, semi-center and outskirts are available. For stock prices we use an index of the shares listed on the Italian Stock Exchange, inclusive of price and dividends. Such data were collected directly by the Bank of Italy until 1992; from 1993, we rely on an index of Morgan Stanley (MSCI Italy) which has the same coverage.

Construction and definitions of the variables

Household net wealth refers to household total assets minus total liabilities as of at the beginning of the year of interview. It is computed subtracting savings and the capital gains/losses on the assets held from end-of-period wealth. Detailed information on end-of-period assets and liabilities is directly available from the data. *Savings* is computed as total after-tax income minus total consumption, as reported in the Survey. The *capital gains/losses* that we consider are those accrued on real estate assets and on listed stocks. Real estate assets include all dwellings, other buildings and land that the household members own at the end of the year of interview. Household net financial and real wealth are computed distinguishing between debt that is related to real estate investment financing and

other liabilities, and assuming that savings are split between real and financial assets as in the national accounts and flow of funds.[16] We then determine beginning-of-period *real estate* and *stocks* assuming that beginning-of-period shares of real assets and financial assets in real estate and stocks, respectively, are the same as at the end of the period. We compute the capital gain/loss accrued on real estate distinguishing, for homeowners, between the house where the household lives and other property. The capital gain/loss on the former is determined as the product of beginning-of-period self-reported value and the change over the coming year in the square-meter price of residential property in the provincial area (central city, semi-central area and the outskirts) where the household lives. The capital gain/loss on the latter is determined as the product of beginning-of-period holdings and the change over the coming year in the average square-meter price of residential property in the province where the household lives. We compute the capital gain/loss accrued on stock holdings as the product of beginning-of-period stocks and the change in the price index of the stocks listed on the Italian Stock Exchange. The gains/losses are then netted of the change in consumer prices.

Household expenditure includes spending on non-durable goods and services, including (actual and imputed) rents. It refers to the whole year of interview.

Household earnings includes wages, salaries, pensions and transfers.

Demographic variables refer to the head of the household, unless specified otherwise. *High school diploma* and *University degree* are dummies denoting the highest level of education attained by the head. *Married* and *Self-employed head* are also dummies describing his/her marital status and occupation. *Not-working* is a dummy that takes on value one if the head is unemployed, retired, working at home (house chores) or a student. *Moved from region of birth* is another dummy denoting an individual living in a region which is different from that where he/she was born. *Living in the Center* and *Living in the South* are dummies that take on value one if the head lives in the Center of the country or in the South, which includes the islands, respectively. *Year: 1993* through *Year: 2002* are dummies referring to the year of interview.

We classify as homeowners those households living in a dwelling which is either owned by the household or occupied under redemption agreement. We exclude those who have moved into their house within the year of interview (2.6 percent of all homeowners).

[16] Based on the national accounts and on the flow of funds, between 1991 and 1998, 80 percent of financial savings was invested into financial assets; between 2000 and 2002, the share went up to 90 percent.

All monetary variables have been deflated using the Consumer Price Index and are in euros of year 2002.

Definition of the sample

From the sample obtained by merging the last six waves of the SHIW, we exclude one household reporting negative non-durable expenditure, 212 reporting negative earnings, 22 households for whom the value of their stock holdings is missing, and other 2,055 households (about 4 percent of the sample) whose head is aged less than 18 or over 80. We also drop 106 households whose capital gains or losses on real estate are over five times their annual earnings and 24 households whose capital losses on stocks are over twice their earnings. Overall, we are left with a sample of 45,147 households.

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