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A "REVERSE ROBIN HOOD"? THE DISTRIBUTIONAL IMPLICATIONS OF NON-STANDARD MONETARY POLICY FOR ITALIAN HOUSEHOLDS

by Marco Casiraghi*, Eugenio Gaiotti*, Lisa Rodano* and Alessandro Secchi*

Abstract

We study empirically the distributional implications of a non-standard monetary policy expansion, considering the measures implemented by the Eurosystem in 2011-2013 and exploiting a rich micro dataset on Italian households' income and wealth, in order to take contemporaneously into account a number of income- and wealth-related channels. Our results do not support the claim that an unconventional monetary loosening acts as a "reverse Robin Hood". Larger benefits accrue to households at the bottom of the income scale, as the effects via the stimulus to economic activity and employment outweigh those via financial variables. The response of net wealth is U-shaped: less wealthy households take advantage of their leveraged positions, wealthier households of their larger share of financial assets. Overall, the effects on inequality are negligible. The results also suggest that the risk of an "expropriation of savers" is not likely to materialize, as the decrease in the remuneration of savings is compensated by support to labor income and by capital gains.

JEL Classification: E52, E58, I14.
Keywords: monetary policy, interest rates, policy effects, inequality.

Contents

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1 Introduction[1]

Does monetary policy affect the distribution of income and wealth? The reduction of inequality lies squarely outside the mandate of central banks, whose objectives are price stability and the stabilization of economic activity; however, the issue has come to the fore with the global economic crisis and the adoption of aggressive, non-standard policy actions.

Before the Great Recession, a widely shared conclusion of the empirical literature was that a monetary expansion is likely to be associated with improved condition for the poor in the short run. At the same time, these effects were considered to be temporary, implying that putting the emphasis on the cyclical effects of monetary policy on poverty would be misguiding. The best that monetary policy could do to reduce inequality in the long run was to aiming at low inflation and stable aggregate demand (Romer and Romer, 1998).

Nonetheless, the conjecture that cyclical effects of non-standard monetary measures on inequality may be different from those associated with conventional policy has been put forward in the aftermath of the Great Recession. Should this claim turn out to be correct, the impact on income and wealth inequality may be a concern for monetary policymakers because it may affect the public support for the independence of central banks. Moreover, it may undermine the determination to pursue aggressive monetary policies when needed and affect the transmission mechanism, denting the effectiveness of the policy stimulus. All these concerns may also have implications for the choice of an optimal fiscal-monetary mix.

In the US, the role of the central bank during the financial crisis and the foundations of its independence were questioned (Bernanke, 2015a, Coibion et al., 2012), based on the claim that the Federal Reserve's non-standard policies, acted as "a reverse Robin Hood" (Bivens, 2015). In other words, unlike what was observed for conventional monetary expansions, very low rates and large-scale asset purchases increased inequality, supporting the wealthy via their effects on asset prices.

In the euro area, a common claim is that very low interest rates are "a bane for savers and a boon for borrowers" (Holzhausen and Sikjova, 2014), implying an "expropriation of savings" and thus imposing disproportionate costs on particular countries. The issue of the potential distributional implications of ECB policies, not only across individuals but also across member states, was also raised in the European Parliament (Claeys et al., 2015).

It has also been suggested that the monetary policy measures undertaken during the Great Recession had an adverse impact on the transmission mechanism. By favouring the wealthy, whose propensity to consume is lower, non-standard measures would be less effective in supporting expenditure compared with "helicopter drops" (Reichlin, Turner and Woodford, 2013) or "QE for the people". The reason is that this second type of measures would not work through increasing asset prices,

[1] We thank Piergiorgio Alessandri, Andrea Brandolini, Philipp Hartmann, Monica Paiella, Lukasz Rawdanowicz, Alfonso Rosolia and seminars participants at the Bank of Italy Workshop on "Unconventional monetary policy: Effectiveness and risks" and at the Sixth Bank of Italy/CEPR Conference on "Monetary policy after the crisis: new views, open questions" (2016) for useful suggestions. The views expressed in the paper are of the authors only and do not necessarily reflect those of the Bank of Italy. All remaining errors are ours.

since they would consist of creating money and handing it directly to the households rather than using it to buy financial assets or finance the banks (Muellbauer, 2014).

Together with the increasing interest by policy makers, recent empirical works have been also devoting more attention to the effects that monetary policy may have on income and wealth inequality. The existing literature has identified three main channels through which monetary policy may have short-run distributional consequences.[2]

The first channel is the *earnings composition channel* that reflects different cyclical elasticity of individuals' employment status and wages, which in turn depends on personal characteristics that vary across income levels. For instance, earnings at the bottom of the distribution have been found to be more sensitive to swings in aggregate employment in the US (Coibion et al., 2012; Bivens, 2015)[3], suggesting that monetary policy benefits the poor and middle-class, by supporting their employment and income.

The second channel is the *savings remuneration (and cost of debt) channel*, which is the consequence of existing differences across households' balance sheets in terms of net financial positions. Intuitively, a decrease in real interest rates would benefit net borrowers and disadvantage net savers at least when keeping everything else unchanged. Following this argument, Holzhausen and Sikjova (2014) find that the loose policy stance of the ECB hurt savers and that Germany is on the losing side of the fence. On the contrary, Bindseil, Dominick and Zeuner (2015) take a different stance on this issue claiming that real rates of return on savings ultimately depend on growth prospects.

The third channel is the *asset price channel*, which stems from heterogeneity in agents' portfolios that leads to very diverse capital gains when rates change. In this respect, asset price movements induced by expansionary policies are usually found to benefit the wealthy and, in some cases, the middle class, even if these results largely differ across countries (Doepke, Schneider and Selezeneva, 2015 for the US; Claeys et al., 2015 and Adam and Tzamourani, 2015 for the euro area).

The above three channels have been usually studied separately. For example, focusing exclusively on the potential effects of monetary policy on household assets and liabilities since the Great Recession, Domanski, Scatigna and Zabai (2016) conclude that rising equity prices may have added to wealth inequality. Differently, the contribution of low interest rates and rising bond prices to inequality is likely to have been small. Importantly, as observed by the same authors, their inability to take into account all the different channels through which monetary policy affects inequality is a crucial limitation of their analysis.

The critical contribution of a holistic approach is clearly emphasized by Bernanke (2015b) who observes that "[…] The better way to look at the distributional effects of monetary policy is to compare changes in the income flowing from capital investments with the income from labour". Similarly, Panetta (2015) argues that quantitative estimates based on a "ceteris paribus" assumption,

[2] For a summary of the main results in the earlier literature, see Romer and Romer (1998).
[3] Bitler and Hoynes (2015) also find that in the US in the Great Recession the most disadvantaged are relatively more affected by the business cycle.

that is obtained singling out one particular channel, may lead to misleading conclusions. The reason is the following: savers are hurt by lower yields, but they also benefits from improved employment opportunities and increased asset prices. Even the studies that aim at giving a more encompassing picture[4] either fail to single out the specific impact of each different channel or fall short of producing a quantitative estimate of their overall relative importance.[5]

In light of these comments, the contribution of this paper is exactly to consider all the three different channels through which monetary policy affects inequality and quantitatively compare them. We pursue this objective in three steps. First, we simulate the responses of a series of macroeconomic and financial variables to a monetary policy impulse. Second, we map these aggregate responses onto household level effects allowing the intensity of the *earning composition*, *saving remuneration* and *asset price channels* to vary across units according to the characteristics of household members and the structure of their balance sheet. Finally, we combine these results, deriving the full impact for each household in terms of income and wealth, and we compute inequality indexes.

We focus on the expansionary policies implemented by the Eurosystem in 2011-2012 (government bonds purchases, liquidity injections and the announcement of the OMT), as well as on two alternatives, namely a monetary accommodation via a purchase programme (like the Eurosystem Asset Purchase Programme) and a "traditional" monetary loosening implemented through a reduction in official interest rates. For each of these scenarios we estimate the aggregate effects on the main Italian macroeconomic and financial variables and assess the associated distributional implications exploiting information on those characteristics of Italian households that may produce heterogeneous responses in incomes and wealth.

To this end, we take advantage of the availability of a rich survey dataset on about 8,000 Italian households which provides detailed information on individual households' characteristics and financial positions, including portfolios' composition. Given that our paper largely relies on the distribution of income, wealth and their components, it is crucial that we can take advantage of recent work that addresses the bias due to non-response and underreporting. This issue, indeed, represents a problem that plagues many of the data so far used in the literature on monetary policy and inequality and is likely to severely distort most of the results.

This approach allows us to address a number of key questions. Did the Eurosystem's expansionary monetary policy increase inequality, due to effects via asset prices and financial markets that dominated the usual effects via employment? Do persistently low interest rates produce an expropriation of savings? Are conventional or unconventional monetary policies different with respect to their impact on income and wealth distributions?

Our analysis yields some important empirical findings. First, the results do not support the claim that an unconventional monetary loosening acts as a "reverse Robin Hood". The reasons are the following. When looking at income inequality, larger benefits accrue to poorer households via the stimulus to economic activity and employment because their labour income is more sensitive to macroeconomic conditions. With respect to inequality along the wealth scale, the response to

[4] Bivens (2015); Claeys et al. (2015).
[5] O'Farrell, Rawdanowicz and Inaba (2016) however consider jointly the effects of the financial channels (the remuneration of savings and capital gains) for a number of countries.

monetary policy is U-shaped: less wealthy households take advantage of their leveraged positions, wealthier households of their larger share of financial assets. Overall, the effects on inequality indexes are almost always negligible. Furthermore, the results suggest that the risk of an "expropriation of savers" is not generalized, since the decrease in the remuneration of savings is largely compensated by support to labour income and by capital gains. Finally, we also do not find that the effects of a non-standard policy expansion on inequality are markedly different from those of a conventional monetary easing, which were documented in the earlier literature.

The remainder of the paper is organized as follows. Section 2 presents the information on monetary policy shocks and the main features of the household dataset that are relevant to our purposes. Section 3 describes the approach and the definitions we use. Section 4 presents the results: the responses of different income and wealth groups and the implications for inequality indexes. Section 5 concludes.

2 The data sources

2.1 The macroeconomic and financial effects of monetary policy

Our starting point is a set of responses of selected Italian macroeconomic and financial variables to a monetary expansion. These responses are estimated with the Banca d'Italia model of the Italian economy and a few satellite models.[6]

We focus on the variables that are relevant for the channels that are described in the introduction, through which monetary policy may have (short-run) distributional consequences. Specifically, the real variables are output, employment, wages, profits, prices, while the impact of a monetary expansion on financial markets is captured by changes in some key interest rates (government bond yields, returns on bank deposits and on loans) and in the prices of several asset classes (houses, bonds, stocks).

Three scenarios are constructed, under different assumptions on the monetary instruments adopted by the central bank and on the market conditions in which the expansion takes place. We consider alternatively a conventional monetary accommodation (i.e. a reduction of official rates) and two unconventional loosenings (which involve asset purchases and liquidity injections). The two unconventional scenarios are based on the operations actually adopted by the Eurosystem respectively during the most acute phase of the sovereign crisis in 2011-2012 and in the fight against lowflation after January 2015. Among others, the relevant difference is that they were conducted under extreme market stress and under more orderly financial market conditions, respectively. It has been argued that the effectiveness of unconventional operations by the central bank and their impact on asset prices varies significantly when financial markets are disrupted (Cúrdia and Woodford, 2011; Gertler and Karadi, 2011).

In order to make the responses comparable, in each scenario we scale the monetary impulse to produce the same effect on real GDP after three years (our simulation horizon), i.e. the same effect

[6] We largely draw on already published work (Casiraghi et al., 2015; Cova and Ferrero, 2015).

estimated for the non-conventional measures implemented by the ECB in 2011-2012 (Casiraghi et al., 2015).

The first profile ("non-conventional expansion under market stress") is also our benchmark case. Table 1 (first column) reports the macroeconomic effects on the Italian economy of the non-standard monetary policy measures taken by the ECB in 2011-2012. These measures include outright purchases of government securities actually implemented (the Securities Markets Programme, SMP) or simply announced (the Outright Monetary Transactions, OMT) and the two large three-year bank refinancing operations (Longer-Term Refinancing Operations, LTRO). These monetary instruments were adopted by the Eurosystem to contrast a severe malfunctioning of the sovereign debt market, a protracted credit crunch and fears of a breakup of the euro, which promoted a severe recession in the euro area. These measures affected the Italian economy mostly through a generalised decrease in yields and alleviating the impending credit crunch (Casiraghi et al., 2015).

The estimates of their macroeconomic and financial effects are based on the Banca d'Italia quarterly model of the Italian economy (BIQM) and on satellite models which provide an assessment of the effect of the SMP on government bond yields, of the LTRO on credit rationing measured via the Eurosystem bank lending survey and of the announcement of the OMT on financial market conditions.

According to these estimates, the monetary expansion sustained real GDP by a significant amount (at the end of the simulation horizon the level of GDP was 2.7% higher than in the counterfactual scenario). The very modest estimated effect on prices (consumption deflator increased by 0.3%) is largely due the appreciation of the exchange rate that followed the reduced fears of a breakdown of the euro area. Among the components of nominal GDP, profits responded more than wages which represents a macroeconomic regularity for the Italian economy. Employment rate was increased by 0.6%.

Among the financial variables, the monetary expansion supported asset prices and contrasted the upward shift of the whole interest rate structure that took place in the period.[7] According to our estimates, long-term yields, bank lending rates and rates on bank deposits were respectively 2.5, 2.1, 1.1 percentage points lower than in a counterfactual baseline.

The estimated response of asset prices is based on these yield movements: stock prices are assessed to increase by 13% (using a dividend discount model), government bond prices by 10% (considering the change in yields and the duration of the Italian public debt)[8], the variation of house prices is much milder (around 2%). These figures are consistent with the findings of the empirical literature, which usually point at a larger effect of monetary policy on financial asset prices than on property prices.

[7] Although was not able to reverting it fully: the spread between yields on Italian and German 10-year government bonds increased by around 3.6 percentage points between June 2011 and early November 2011 (to 5.5) and decreased by only 2.8 percentage points from that date to mid-2013.

[8] We assume that the composition of the government bond portfolio of each household at the beginning of the simulation period mimics the government debt structure (the average residual life of public debt is around 6 years). Capital gains for bonds that did not expire during the simulation period are computed multiplying their modified duration (at the end of the simulation) by the change in interest rates associated with monetary impulse.

The second profile ("conventional monetary expansion") refers to a conventional monetary expansion calibrated so as to produce the same effect on real GDP after three years as the previous scenario. Its macroeconomic impact is derived from a simulation of the BIQM, assuming (i) a gradual, but temporary, fall in short-term rates that amounts to -430 basis points after three years before being slowly reverted, (ii) a fall in long-term rates consistent with the expectation hypothesis and (iii) a depreciation of the exchange rate consistent with the UIP.

In this scenario, the effects on the interest rate term structure are more concentrated on the shorter end because the term structure progressively steepens. Therefore, bank lending rates fall proportionately more than bond yields and the effects on financial asset prices, particularly on bond prices, are more muted; however, the effects on house prices are larger, due to the sensitivity of house prices to bank lending rates. Most of the estimated responses of the macroeconomic variables presented in column 2 of Table 1 are broadly in line with those of the first scenario.[9]

The third profile ("unconventional expansion without market stress") is based on a BIQM simulation of the effects on the Italian economy of a monetary loosening obtained through a purchase programme analogous to the one introduced by the ECB in early 2015 (Asset Purchase Programme, APP). The APP consists of asset purchases amounting to 80 billion euro per month (of which around 10 in Italy),[10] to be continued until reaching a sustainable convergence of inflation to its target of below but close to 2 percent, but in any case at least until March 2017. The programme was not aimed at restoring a malfunctioning in the monetary transmission mechanism or contrasting market disruption, but at fighting the risk of inflation remaining too low for too long.

The estimated macroeconomic responses (column 3 of Table 1) are based on those provided by Cova and Ferrero (2015).[11] They show a larger increase in consumer prices than in the first scenario, which in turns mainly reflects the stronger depreciation of the exchange rate. With respect to financial variables, the estimates suggest a smaller fall in deposit and lending rates, due to the limited movements of official rates in the proximity of their lower bound, and a less sharp response of asset and bond prices.[12]

2.2 The household survey: income, wealth and portfolio composition

Information on individual households' characteristics and on their balance sheet are obtained from the Survey of Household Income and Wealth (SHIW). The survey, which is conducted by Banca d'Italia every other year, collects data on several social and economic characteristics of the household members, such as age, gender, education, employment, income, and detailed information on household' balance sheet items. SHIW is conducted since 1960; the sample used in most recent

[9] The effect on the consumption deflator is slightly larger due to a more persistent depreciation of the exchange rate.
[10] The amount of purchases under the APP was 60 billion per month from March 2015 to March 2016.
[11] Based on the initial characteristics of the APP, Cova and Ferrero (2015) estimate an impact of the programme on long term yields of around -80 basis points. The macroeconomic effects reported in Table 1 are obtained rescaling this value to -110 basis points, so as to obtain a cumulated impact on GDP over the simulation horizon equal to 2.7%, as in the first two scenarios presented in this section.
[12] In the first scenario the drop in risk premia was much larger, due to the exceptionally high level they had reached as a consequence of the perceived risk of a euro breakdown before the adoption of a series of monetary measures by the Governing Council of the ECB.

surveys comprises about 8,000 households distributed over 300 Italian municipalities. Since 2010, it provides data for Italy in the Eurosystem's Household Finance and Consumption Survey (HFCS).[13]

SHIW is largely used in academic research. Like other similar surveys, it suffers from a bias due to underreporting and missing responses on economic conditions, particularly by the wealthiest households. Properly accounting for this misrepresentation is crucial to our exercise, which largely relies on the distribution of income, wealth and their components. To override this source of bias, we take advantage of the availability of income and asset data adjusted for underreporting, constructed by D'Alessio and Neri (2015).[14,15]

In this paper we only exploit the cross-sectional dimension of the survey and use the 2010 questionnaire as the starting point to which we apply the changes in the macroeconomic and financial variables described in the previous section. Tables 2-4 show the main features of our dataset, by wealth and income deciles, that are relevant to gauge the distributional effects of monetary policy along the three channels mentioned in section 1.[16]

In the survey after-tax income is defined as the sum of earnings from payroll employment, earnings from self-employment (i.e. the sum of self-employment and entrepreneurial income), pensions and other welfare benefits, and net returns from house properties and financial holdings/debt.

The composition of the sources of income varies significantly along the wealth scale (top panel of Fig. 1 and Table 2). The share of earnings obtained from payroll employment decreases with wealth, while the share of earnings from self-employment rises. Total earnings from employment (the sum of payroll and self-employment) decreases with wealth (from 71% to 53%).

The picture is rather different along the income scale (bottom panel of Fig. 1 and Table 2): the share of earnings from payroll employment is low for the bottom groups (these make their living mostly out of public pensions or welfare). It then it rises rapidly, reaching a peak for the middle class, it falls again for the top 20%, who obtain a large share of earnings from self-employment.

Net wealth in the survey is defined as the sum of housing wealth, firm ownership, bank and post office deposits, government bonds and other financial assets (shares and equities, investment fund units) minus bank loans, commercial debt and loans from other households. Overall, total wealth is about 8 times income, a proportion that broadly matches the evidence from financial accounts.

Less wealthy households have typically lower wealth/income ratios and higher leverage (top panel of Fig. 2 and Table 4). In contrast, the distribution by income levels again evolves less

[13] The survey results are regularly published (e.g., Banca d'Italia, 2014). The (unadjusted) individual data are available for research, in an anonymous form (http://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/distribuzione-microdati/index.html).

[14] The adjusted data have been kindly made available by the authors.

[15] D'Alessio and Neri (2015) use various adjustment methods, with the specific objective to be able to perform micro studies on Italian households that are consistent with the macroeconomic information on income, wealth and debt. The corrections are based on adjustments of sample weights to consider non-reporting, as well as on calibrations that exploit information about the sample composition and the total amount of key variables in the population, and on satellite models. They mostly affect earnings from self-employment, the stock of housing, holdings of financial assets and total wealth.

[16] We consider the 2010 survey, since it provides the appropriate initial conditions to study the effects of the monetary policy measures in our main scenario, taken since the onset of the sovereign debt crisis in 2011. The results would not materially change if the 2012 survey was used.

monotonically. The very low-earners (those below the first decile of the income distribution) have higher leverage, unlike the households in the immediately following groups; leverage reaches a peak around the median income (bottom panel of Fig. 2 and Table 3).

By looking at the composition of assets, one can see that the share of wealth invested in housing broadly follows an inverted U-shape pattern along both the income and the wealth scale (Fig. 3 and Table 3). The distribution has a local peak around the median, with the exception of the bottom decile of the wealth scale, for which housing is around 90%. Poorer households (both in terms of wealth and income) mostly held their financial assets in the form of bank deposits and government bonds, whereas households in the top decile invest most of their financial portfolio in shares, equities and "other securities".

3 Methodology and definitions

The impact of monetary policy on households' income and wealth through the channels described in Section 1 is derived starting from the definition of household non-financial income (*YN*), financial income (*YF*), gross wealth (*GW*) and net wealth (*W*):

$$YN_{i,t} = YL_{i,t} + P_{i,t} + AY_{i,t} \quad (1)$$

$$YF_{i,t} = rd_{i,t}\, D_{i,t-1} + rb_{i,t}\, B_{i,t-1} - rl_{i,t}\, L_{i,t-1} + AFY_{i,t} \quad (2)$$

$$GW_{i,t} = h_t H_{i,t} + b_t B_{i,t} + a_t A_{i,t} + D_{i,t} \quad (3)$$

$$W_{i,t} = GW_{i,t} - L_{i,t} \quad (4)$$

where *i* and *t* index the household and time period, respectively. *YL* is labour income (including both payroll employment and self-employment), *P* is the component of income that is attributable to profits and *AY* are other sources of non-financial income, such as public pensions. Regarding financial variables, *rd*, *rb*, *rl* are the average interest rates on the stock of bank deposits, government bonds and bank loans, whose corresponding stocks are denoted by *D*, *B* and *L*. *AFY* are other sources of net financial income; *h*, *b*, *a* are house, bond and share prices, *H* and *A* are the stocks of housing and shares. To simplify the notation, all variables are expressed in real terms. The impact of monetary policy on income and wealth is measured as the deviation of the level of their components in the final period (year) of the simulation (*t1*) from the initial period (*t0*).

Based on eq. 1, and the impact of monetary policy on income through the *earnings composition channel* is:

$$\left(\frac{YN_{i,t1} - YN_{i,t0}}{Y_{i,t0}}\right) = \left(\frac{YL_{i,t1}}{YLi,_{t0}} - 1\right)\left(\frac{YL_{i,t0}}{Y_{i,t0}}\right) + \left(\frac{P_{t1}}{P_{t0}} - 1\right)\left(\frac{P_{i,t0}}{Y_{i,t0}}\right) \quad (5)$$

where $Y_{i,t} = YN_{i,t} + YF_{i,t}$ is household *i*'s total income at time *t*. The right-hand side of the above equation includes two terms. The first one is the sum of the product of the cumulated percent increase in the aggregate wage bill times the household's share of income from payroll employment and self-employment.[17] The second term corresponds to the product of the cumulated percent

[17] The percent increase in the aggregate wage bill in response to changes in aggregate employment and GDP is allowed to vary across households depending on the characteristics of its members as described in Section 4.1.

increase in aggregate profits times the household's share of income associated with profits. Throughout the paper, we assume that profits grow at the same rate for all households $\left(\frac{P_{t1}}{P_{t0}} = \frac{P_{i,t1}}{P_{i,t0}}\right)$ and public pensions and welfare (*AY*) are fully indexed to inflation.

To derive $YL_{i,t1}/\ YL_{i,t0}$ we estimate how household's labour income when employed and the probability of having a job respond to macroeconomic conditions running auxiliary regressions (discussed in section 4.1) on Italian data from the EU-SILC survey (which provides information on income and employment at an annual frequency and on an adequate sample of individuals).

Based on eq. 2, the impact of monetary policy on income through the *savings remuneration channel* is measured as the sum of the products of the response of each average yield times the corresponding item in the household's portfolio:

$$\left(\frac{YF_{i,t1}-YF_{i,t0}}{Y_{i,t0}}\right) = \left(\frac{rd_{t1}}{rd_{t0}} - 1\right)\left(\frac{rd_{t0}D_{i,t0}}{Y_{i,t0}}\right) + \left(\frac{rb_{t1}}{rb_{t0}} - 1\right)\left(\frac{B_{i,t0}}{Y_{i,t0}}\right) - \left(\frac{rl_{t1}}{rl_{t0}} - 1\right)\left(\frac{L_{i,t0}}{Y_{i,t0}}\right) \quad (6)$$

We also assume that the changes in the average interest rates on bonds and on bank loans included in households' portfolios are linked to the movements in market rates (the latter directly to monetary policy as in table 1). Formally, $rb_{t1} - rb_{t0} = \alpha\left(\widetilde{rb}_{t1} - \widetilde{rb}_{t0}\right)$ and $rl_{t1} - rl_{t0} = \gamma\left(\widetilde{rl}_{t1} - \widetilde{rl}_{t0}\right)$, where α is the share of bonds that mature and are rolled-over during the simulation period and γ is the share of variable-rate loans to households (the tilde indicates the interest rate on new bonds and new loans).[18] We assume that the variation in nominal rents simply reflects the inflation rate, making real rents constant over the simulation horizon.[19]

Based on eq. 3, the impact of monetary policy on *capital gains* on gross wealth is measured as the sum of the products of the percent increase in house prices, bond prices and share prices (whose values can be derived from table 1), times each household's holdings of real and financial assets:

$$CG_{i,t+1} = \left(\frac{h_{t1}}{h_{t0}} - 1\right)\left(\frac{h_{t0}H_{i,t0}}{GW_{i,t0}}\right) + \left(\frac{b_{t1}}{b_{t0}} - 1\right)\left(\frac{b_{t0}B_{i,t0}}{GW_{i,t0}}\right) + \left(\frac{a_{t1}}{a_{t0}} - 1\right)\left(\frac{a_{t0}A_{i,t0}}{GW_{i,t0}}\right) \quad (7)$$

Finally, based on eq. 4 and on the dynamic link between savings and asset holdings, we consider the impact on net wealth, measured as its deviation in *t1* from a no-policy baseline:

$$\frac{W_{i,t1}-Wb_{i,t1}}{W_{i,t0}} = \left(\frac{GW_{i,t0}}{W_{i,t0}}\right)CG_{i,t1} + \frac{\sum_{t=t0+1}^{t1}(S_{i,t}-S_{i,t0})}{W_{i,t0}} - \left(\frac{L_{i,t1}}{L_{i,t0}} - 1\right)\left(\frac{L_{i,t0}}{W_{i,t0}}\right) \quad (8)$$

where *S* is savings, obtained by applying to the changes in income and wealth the propensities to consume out of income and out of capital gains taken from Bartiloro and Rampazzi (2013).[20]

We summarize the results by first showing the responses of income and wealth and the contribution of different channels aggregating households by income and wealth groups and then computing

[18] For the Italian households, $\gamma \approx 0.70$. To compute α, we assume that the composition of the portfolio of each household at the beginning of the simulation period mimics the government debt structure.

[19] This hypothesis is consistent with the short dimension of our simulation horizon and with the fact that the Italian rental market is strictly regulated.

[20] We assume that savings are accumulated in the form of 'other assets' (AW), otherwise an interaction term should also enter eq. 8. This is done to simplify expressions: the quantitative results would not be appreciably affected if we removed this assumption.

changes in various measures of wealth, income and labour income inequality. Inequality is measured by Gini coefficients, as well as by the ratio of the 9th decile to the 1th decile (p90/p10) and by the ratio of the 3rd quartile to the 1st quartile (p75/p25).[21]

4 Results

4.1 Heterogeneity in the cyclical elasticity of labour earnings

This section aims to evaluate whether labour earnings by poorer households are more sensitive to macroeconomic conditions than those by richer households.[22] Importantly, an individual's labour income may vary due to changes both in the probability of being employed and in the wage level. Therefore, we are interested in estimating how the probability of having a job and the corresponding labour income vary across households in response to changes in aggregate employment and GDP, depending on the characteristics of the individuals living in each household.

As just explained, the variation in labour income of individual *i* can be decomposed into two separate effects, formally:

$$YL_{i,t1} - YL_{i,to} = w_{i,t1}\left(E_{i,t1} - E_{i,t0}\right) + E_{i,t0}\left(w_{i,t1} - w_{i,t0}\right) \qquad (9)$$

where the variable $E_{i,t}$ is equal to 1 if the individual *i* is employed and 0 otherwise, and $w_{i,t}$ denotes labour earnings. The equation above shows that the assessment of the impact of a change in macroeconomic conditions on each individual labour income (the left-hand side of the equation) requires the estimation of at least three variables. The first term on the right-hand side of eq. 9, indeed, depends on the probability of finding a job and the associated income, while the second represents the change in labour income of individuals who are employed in both periods. In other words, we need to estimate how job finding probability, the income of newly employed and that of already employed vary according to different macroeconomic conditions and in particular in response to changes in aggregate employment and GDP.

To this end we exploit the information on Italian individuals available in the EU-SILC surveys from 2004 to 2013;[23] compared to SHIW, this survey has the advantage of being conducted at an annual frequency rather than every other year (further information in the Appendix). The impact of macroeconomic conditions on the probability of having a job is estimated through a probit regression of the individual employment status on a number of individual characteristics and their interactions with the aggregate employment rate. Specifically, we estimate

$$E_{i,t} = \alpha + \beta_1 E_t + \beta_2 E_t * X_{i,t} + \beta_3 X_{i,t} + \varepsilon_{i,t} \qquad (10)$$

[21] These measures can move in opposite directions if individuals in the middle of the distribution are affected differently than individuals at the bottom.

[22] For the US, Bivens (2015) regresses the annual log change in household comprehensive income in the bottom, middle and top fifth on the income distribution on the log-change in aggregate household income. He finds the elasticity of earnings of the lower and upper 20% to aggregate earnings to be respectively 1.5 and 0.2.

[23] The European Union Statistics on Income and Living Conditions (EU-SILC) is a cross-sectional and longitudinal sample survey, coordinated by Eurostat, based on data from the EU member states. It provides data on income, poverty, social exclusion and living conditions in the European Union.

where *i* indexes the person and *t* the time (in years). The dependent variable $E_{i,t}$ is equal to 1 if the person has worked for at least one month during the reference year, and 0 otherwise. The covariates are the aggregate employment rate E_t for the population in working age (i.e. between 15 and 64 years old), a set of individual characteristics $X_{i,t}$ (in the form of dummy variables), namely age, sex and education level.[24] Moreover, we include all the interaction terms between the aggregate employment rate and individual characteristics.

The full results are reported in the Appendix (Table A.1). The estimates show that an increase in the aggregate rate of employment is associated with a higher probability of having a job at the individual level, that is the coefficient β_1 is positive and statistically significant. Moreover, all the coefficients on the interaction terms are significant as well. In turn, this implies that the magnitude of an increase in the aggregate employment rate depends on individual characteristics: the increase in the probability of being employed associated with a higher aggregate employment rate is larger for individuals more than 25 years old and is positively related to the education level. At the same time the effect is smaller for women.

The estimates for the income of newly employed workers are based on the following equation:

$$\frac{w_{i,t}^h}{P_t} = \alpha + \beta_1 \frac{GDP_t}{P_t} + \beta_2 X_{i,t} + \varepsilon_{i,t} \qquad (11)$$

with the dependent variable being the hourly compensation in real terms that includes both of employee and self-employed income. The variables on the right-hand side are the real GDP in year *t* and those in vector $X_{i,t}$, which consists of the same individual characteristics used in the previous regression.

Table A.2 in the Appendix shows the results from estimating eq. 11. All the coefficients are statistically significant and have the expected sign. Besides being positively associated with real GDP, labour income of newly employed increases with the level of education and age, which is likely to partially capture the effect stemming from more working experience. Once again, the positive impact of improved macroeconomic conditions is smaller if the individual is a female, who benefits less in terms of estimated hourly compensation when newly employed.[25]

Finally, we provide estimates for the elasticity of real labour income growth to real GDP growth, considering only the individuals that are employed in all the years they participate in the survey (i.e. 4 years). In this way, we make sure that the estimation is not affected by changes in the employment status rather than variation in the aggregate level of economic activity. More in detail, we estimate the following equation:

$$D.log\ \frac{w_{i,t}^h}{P_t} = \alpha + \beta_1 D.log\ \frac{GDP_t}{P_t} + \beta_2\ D.log\ \frac{GDP_t}{P_t} * X_{i,t} + \beta_3\ X_{i,t} + \varepsilon_{i,t} \qquad (12)$$

[24] See the Appendix for more details on how dummy variable corresponding to individual characteristic are defined.
[25] Predicted wages are broadly unaffected by including the interaction terms between the proxy for macroeconomic conditions (i.e. real GDP in this case) and the individual characteristics, as in the previous specification.

where the *D* denotes the first difference operator. The dependent variable is the logarithm of the hourly compensation in real terms of individual *i*, $log\ \frac{GDP_t}{P_t}$ is the log real GDP, and $X_{i,t}$ represents the usual set of individual characteristics.

According to the results reported in the Appendix (Table A.3), the relationship between labour income growth and real GDP growth is positive. Young workers (i.e. up to 25 years old) and women seem to benefit more from higher GDP growth. Moreover, the estimated relationship becomes smaller for workers who attained a lower or upper secondary education level. All in all, the estimates at individual level suggest that labour income increases as macroeconomic conditions improve: not only already employed people see their income increase, but also unemployed are more likely to find a job and expect to earn more. In order to assess the impact of monetary policy on inequality through its impact on labour market, the estimates presented in this section are combined to compute, for each household in our sample, the total variation of labour income entering eq. 5 as a function of the characteristics of its members, namely sex, age, education level and employment status.

4.2 Effects across the wealth distribution

In this Section we illustrate the results for the three transmission channels from eq.s 5, 6 and 7, taking into account the possibility of different labour income elasticities across households, as well as the responses of total income and the accumulation of net wealth (eq. 8).

In Fig. 4 and in Table 5 we present the evidence concerning the distributional effects of an "unconventional monetary expansion under market stress" (ECB 2011-12 policy loosening) grouping households by their initial position in the wealth distribution.

[Figure 4 about here]

Via the *earnings composition channel* (top-left panel), monetary policy, by supporting production and employment, gives a larger boost to income for the households in the lower portion of the wealth distribution. This effect derives mostly from the larger elasticity of the low-income households to the cycle; in contrast, differences in the composition of the sources of earnings (the other possible source of heterogeneity in eq. 5) do not contribute much to distributional implications (as shown in the second column of Table 5).

The effects via *savings remuneration and cost of debt* (top-middle panel) reinforce the previous ones, as they are also largely in favour of the less wealthy. They are positive for the first half of the population, then become negative, slightly more so for the top 20%. For the households with large debt the reduction in debt service more than compensates the effect of the fall in yields on interest income.

Capital gains (top-right panel), measured in percent of assets, are larger for the wealthy households: they hold a larger proportion of their wealth in financial form, and in the scenario considered financial asset prices rise more than house prices.

As a result of the first two channels, *total income* (bottom-right panel) is mostly supported for the less wealthy households; the effect of the earnings composition channel is reinforced by the savings remuneration channel. The effect decreases as one progresses up the wealth scale.

The response of *net wealth* (bottom-right panel) is remarkably different from the pattern of capital gains on assets, due to the distribution of debt. It is U-shaped: households at the top of the distribution take advantage of their larger capital gains on assets, while poorer households enjoy fewer capital gains, but they take advantage of their higher leverage, which implies that a given capital gain has a larger impact on net wealth.

Fig. 4b compares the responses associated with an "unconventional expansion under market stress" with those of a "conventional expansion" and an "unconventional expansion without market stress". It suggests that the differences among the profiles of the responses to various types of monetary policies (blue, red and green lines) are not large in economic terms. Under a "conventional expansion" (red lines) and an "unconventional expansion without market stress" scenario (green lines), the response of capital gains is flatter, due a stronger increase in house prices, that benefits the less wealthy who own a larger proportion of their wealth in housing. In the "unconventional expansion without market stress" scenario, the larger response of inflation implies a larger increase in (real) net wealth for the households at the bottom of the distribution, since higher prices reduce the real value of debt for the leveraged households.[26]

4.3 Effects across the income distribution

Distributional effects along the income scale are smaller than those along the wealth scale (fig. 5). An important element driving these results is the pattern of leverage, which (as it was discussed above) is not monotonically related to the position of the household on the income scale: a local peak in leverage is reached for the households around the median income.

All in all, the effect through the *earnings composition channel* (top-left panel) remains largely in favour of the households in the lower portion of the income distribution (as in the previous case, the monetary expansion supports more intensely the low-earners, and is felt less and less as one progresses up the income scale). This channel is however not reinforced, but rather largely compensated by the net effect of the change in *savings remuneration and cost of debt* (top-middle panel). The responses via this channel do not follow a simple pattern: households below the median are adversely affected by the fall in the yield of bank deposits. *Capital gains* (top-right panel) are more evenly distributed across the population.

As a consequence, the *effects on total income* (bottom-right panel) are in favour of the households at the bottom of the distribution, but also slightly benefit other groups just above the median. The effects on *net wealth* (bottom-right panel) mirror the pattern of capital gains on gross assets.

The differences among the profiles of the responses to various types of monetary shocks (Fig. 5b) are overall not much different from each other.

[26] An important qualification is that this conclusion rests on the assumption that earnings from pension or welfare payments are fully indexed to inflation.

4.4 Effects on inequality

The effects on inequality indexes are presented in Table 6 for wealth, total income and labour income. To assess the relevance of changes in the indexes, we report both bootstrapped standard deviations and the historically observed average year-to-year standard deviation from 1995 to 2012.

All in all, the movements of the wealth and income inequality indexes are negligible; only labour income inequality is appreciably reduced by a monetary policy expansion.

According to the Gini index the sign of the impact on wealth inequality depends on the specific type of monetary measure adopted; on the contrary the effect is always negative if measured by the interdecile or the interquartile ratio. However, the size of the movements is small both in statistical and economic terms in most of the cases. The differences in the percent responses of wealth across different household groups observed in the previous two sections do not appreciably affect relative levels; the poorer households gain more in percent terms but start from much lower levels.

Also the variations in income inequality are negligible.

Labour income inequality stands out as an exception. From a statistical perspective, the changes in labour income inequality are always at least two times larger than bootstrapped standard deviations when measured both with the Gini and by the ratio of the 3rd quartile to the 1st quartile (p75/p25) of the distribution. Furthermore, the effect is also economically relevant as its size is equal to, or of an order of magnitude comparable with, the historical standard deviation of this type of inequality.

4.5 Effects on sub-groups of households

A specific question raised in the public debate is whether non-standard measures differ from conventional policies in the extent in which they may cause an "expropriation of savers".

Our results confirm the view that in order to identify the "winners" and "losers" from non-standard policies one needs to move beyond the simple borrowers-versus-savers dichotomy (Panetta, 2015). In Table 7 (which presents results along the wealth scale) the results of the simulation are reported aggregating households into those two groups. For purposes of illustration, here we define as 'savers' all the households with strictly positive net financial asset holdings (although other definitions are obviously possible). By construction, our exercise concentrates on short-run effects only; even with this limitation,[27] three features stand out.

First, considering the savers-borrowers dichotomy, the effects of a non-standard monetary expansion and those of a conventional monetary expansion look very much alike. If any, in the case of a non-standard monetary expansion, savers' income is hit less hard (because official rates, hence short-term rates and deposits rates, fall less) and savers' wealth is more strongly supported (because asset prices rise more) than under a conventional expansion.

[27] Panetta (2015) argues that over the medium term expansionary monetary policies designed to fend off deflation and stimulate economic growth also generate higher real interest rates; hence, in a longer-term perspective even the interest income channel may work in the opposite direction to that posited by "expropriation of savings" view. Similar arguments are advanced by Bindseil, Dominick and Zeuner (2015).

Second, on average, over the simulation period, not all savers' groups suffer in terms of current income: for the bottom 20% the loss in financial income is compensated by the positive response of employment and wages and so total income rises.

Finally, all the reported groups of savers gain in terms of net wealth. This evidence suggests that the risk of an "expropriation of savers" is not generalized, since the decrease in the remuneration of savings can be compensated by capital gains.

5 Conclusions

This paper addressed the short-run distributional implications of a monetary expansion; these are by definition of a cyclical nature, and are bound to be reversed when monetary policy has to turn restrictive to avoid overheating of the economy. It has been long argued, convincingly, that they must therefore not play a role in shaping policy decisions. Recently, however, it has been claimed that ultra-loose policies have changed that picture, and that short-run effects on inequality can be exceedingly large and/or may hit the poorer households via financial variables exactly when they need more support, posing a challenge to central banks.

The results of this paper suggest that this is not the case. We argued that in order to assess whether non-standard monetary policy can generate serious distributional effects, a holistic assessment of how a number of income- and wealth-related channels work together needs to be developed; we presented an empirical quantitative assessment based on income and wealth survey data for Italian households.

Our main quantitative finding is that by far the most relevant short-term distributional implication of expansionary monetary policy remains that, supporting the economy, the latter has a larger effect on the incomes of the less well-off, because they have jobs and wages more sensitive to cyclical fluctuations; the financial effects either reinforce (along the wealth scale, because households with negative net worth also benefit most from a drop in the cost of borrowing) or are not enough to counteract (along the income scale) the distributional implications that take place via the labour market.

The response of households' wealth is moderately U-shaped. The ability to exploit capital gains does not vary monotonically with net wealth: richer households do benefit more than the average from a non-standard intervention, thanks to the capital gains on their holdings of financial assets, but households at the bottom of the wealth scale can also take a larger advantage, due to their higher leverage.

We do not find that the effects of the non-standard policy expansion on inequality are markedly different from those, documented in the earlier literature, of a conventional monetary easing: in the short-run, in both cases the conditions of the less wealthy are (temporarily) improved, particularly concerning labour income; but these effects are not enough to have a significant impact on inequality indexes.

The size of the effects does not suggest the need to systematically take the short-term distributional implications into consideration as a constraint in monetary policy decisions. The results are

consistent with the traditional view that monetary policy makers should stick to their own objectives, and that the best contribution they can give to income distribution is indirect, through price stability and output stabilization.

The results of our exercise do not confirm that ultra-loose monetary policy is necessarily a ‘bane for savers’. The unfavourable effects of low interest rates on the remuneration of savings are largely compensated by the capital gains enjoyed by the savers themselves and, for the low-income savers, by the boost given to their labour income. Conclusions on the so-called expropriation of savings based on the inspection of a single channel of transmission in isolation are likely to be misleading.

References

Adam, K. and P. Tzamourani (2015), "Distributional consequences of asset price inflation in the euro area", Deutsche Bundesbank, *Discussion Paper*, No. 27.

Banca d'Italia (2014), "Household income and wealth in 2014", *Supplements to the Statistical Bulletin*, No. 5 (http://www.bancaditalia.it/pubblicazioni/indagine-famiglie/bil-fam2012/engl_suppl_27_2014.pdf?language_id=1).

Bartiloro, L. and C. Rampazzi (2013), "Il risparmio e le famiglie italiane durante la crisi", Banca d'Italia, *Questioni di economia e finanza (Occasional papers)*, No. 148.

Bernanke, B. (2015a), "Monetary policy and inequality", http://www.brookings.edu/blogs/ben-bernanke/posts/2015/06/01-monetary-policy-and-inequality.

Bernanke, B. (2015b), "The Courage To Act: A Memoir of a Crisis and its Aftermath", W. W. Norton and Company.

Bindseil, U., D. Dominick and J. Zeuner (2015), "Critique of accommodating central bank policies and the 'expropriation of savers' ", European Central Bank, *Occasional Paper*, No. 161.

Bivens, J. (2015), "Gauging the impact of the Fed on inequality during the great recession", *Hutchins center on fiscal & monetary policy at Brookings*, *Working Paper*, No. 12.

Bitler, M. and H. Hoynes (2015), "Heterogeneity in the Impact of Economic Cycles and the Great Recession: Effects Within and Across the Income Distribution", *American Economic Review, Papers and Proceedings*, Vol. 105, No. 5, pp. 154-160.

Casiraghi, M., E. Gaiotti, M.L. Rodano and A. Secchi (2015), "The impact of unconventional monetary policy on the Italian economy during the sovereign debt crisis", forthcoming, *International Journal of Central Banking.*

Claeys, G., Z. Darvas, A. Leandro and T. Walsh (2015), "The effects of ultra-loose monetary policy on inequality", *Bruegel policy contribution*, June.

Coibion, O., Y. Gorodnichenko, L. Kueng and J. Silvia (2012), "Innocent bystanders? Monetary policy and inequality in the US", IMF *Working paper*, No. 12/199.

Cova, P. and G. Ferrero (2015), "The Eurosystem's asset purchase programmes for monetary policy purposes", Banca d'Italia, *Questioni di economia e finanza (Occasional Papers)*, No. 270.

Cúrdia, V. and M. Woodford (2011), "The central-bank balance sheet as an instrument of monetary policy", *Journal of Monetary Economics*, Vol. 58, No. 1, pp. 54-79.

D'Alessio, G. and A. Neri (2015), "Stime campionarie del reddito e della ricchezza familiare coerenti con le stime aggregate: alcuni esperimenti", Banca d'Italia, *Questioni di economia e finanza (Occasional Papers)*, No. 272.

Doepke, M., M. Schneider and V. Selezeneva (2015), "Distributional effects of monetary policy", Hutchins center on fiscal & monetary policy at Brookings, *Working Paper*, No. 14.

Domanski, D., M. Scatigna and A. Zabai (2016), "Wealth inequality and monetary policy", *BIS Quarterly Review*, March.

Gertler, M. and P. Karadi (2011), "A model of unconventional monetary policy", *Journal of Monetary Economics*, Elsevier, Vol. 58, No. 1, pp. 17-34.

Holzhausen A and S. Sikova (2014), "The impact of the low interest rate policy on private households in the Eurozone", Allianz Group Public Policy and Economic Research, *Working paper*, No. 176.

Muellbauer, J. (2014), "Combatting Eurozone deflation: QE for the people", *Vox-EU*, 23 December.

O'Farrell, R., Ł. Rawdanowicz and K. Inaba (2016), "Monetary Policy and Inequality", *OECD Economics Department Working Papers*, No. 1281, OECD Publishing, Paris.

Panetta, F. (2015), "The Distributional Consequences of Monetary Policy", remarks at the DNB conference, Amsterdam, 20 November (http://www.bancaditalia.it/pubblicazioni/interventi-direttorio/int-dir-2015/Panetta_20.11.2015.pdf)

Reichlin, L., A. Turner and M. Woodford (2013), "Helicopter money as a policy option", *Vox-Eu*, 20 May.

Romer, C. and D. Romer (1998), "Monetary policy and the well-being of the poor", NBER Working Paper, No. 6793.

TABLES

Table 1

RESPONSES OF SELECTED ITALIAN MACROECONOMIC VARIABLES TO MONETARY EXPANSIONS

(deviations from a 'no policy' scenario; percent or basis points)

	Non conventional expansion under market stress (1)	Conventional expansion (2)	Non conventional expansion without market stress (3)
GDP	2.7	2.7	2.7
Employment rate	0.6	0.6	1.0
Consumption deflator	0.3	1.0	2.8
GDP deflator	0.8	1.1	2.8
Wage bill (nominal)	2.7	2.8	4.3
Earnings from self employment (nominal)	2.9	3.0	4.6
Profits (nominal)	5.9	6.1	8.2
Deposit rate	-108	-216	0
T-bond rate	-254	-215	-109
Lending rate	-207	-279	-41
House prices	1.7	3.8	5.2
Bond prices	10.3	2.6	3.3
Share prices	12.8	9.3	7.0
Horizon	3 years	3 years	3 years

Note: deviation of the level of each variable from baseline at the end of the simulation horizon (average over the simulation period for interest rates). These responses are estimated with the Banca d'Italia model of the Italian economy and a few satellite models. − (1) Effects of the ECB Security markets programme, liquidity injections and Outright Monetary Transactions over 2011-2013. See Casiraghi et al. (2015). - (2) Effects of a gradual and temporary 430 b.p. decrease in short term rate. - (3) Effects of an asset purchase programme. Based on a simulation of the effects of the Eurosystem Asset Purchase Programme on the Italian economy. See Cova and Ferrero (2015).

Table 2

COMPOSITION OF HOUSEHOLD INCOME

(percent)

By wealth

Household group within net wealth distribution	Payroll Employment	Pensions and Welfare benefits	Self employment	Housing	Financial capital	Total
0-10%	54.2%	23.9%	16.6%	12.4%	-7.1%	100.0%
10-20%	45.8%	25.6%	16.9%	14.1%	-2.4%	100.0%
20-30%	37.8%	29.1%	15.1%	19.3%	-1.3%	100.0%
30-40%	35.1%	28.9%	15.3%	22.2%	-1.5%	100.0%
40-50%	40.6%	24.2%	12.8%	22.3%	0.1%	100.0%
50-60&	40.7%	26.2%	12.8%	20.5%	-0.2%	100.0%
60-70%	36.9%	23.9%	17.0%	22.8%	-0.5%	100.0%
70-80%	31.3%	23.8%	22.3%	23.0%	-0.5%	100.0%
80_90%	27.4%	20.2%	27.7%	23.3%	1.4%	100.0%
90-100%	16.6%	14.9%	36.7%	22.4%	9.4%	100.0%

By income

Household group within income distribution	Payroll Employment	Pensions and Welfare benefits	Self employment	Housing	Financial capital	Total
0-10%	23.8%	48.9%	10.4%	19.2%	-2.4%	100.0%
10-20%	27.8%	48.7%	6.1%	18.0%	-0.5%	100.0%
20-30%	35.3%	40.4%	5.7%	19.5%	-0.9%	100.0%
30-40%	36.3%	34.4%	8.1%	22.3%	-1.1%	100.0%
40-50%	37.1%	33.3%	9.8%	22.1%	-2.2%	100.0%
50-60%	42.0%	31.3%	8.8%	19.3%	-1.4%	100.0%
60-70%	46.8%	24.2%	11.0%	20.1%	-2.1%	100.0%
70-80%	49.9%	21.2%	10.4%	19.9%	-1.4%	100.0%
80_90%	44.3%	18.7%	17.9%	20.5%	-1.4%	100.0%
90-100%	29.8%	13.3%	35.7%	19.3%	1.9%	100.0%

Source: Banca d'Italia, Survey of Household Income and Wealth, 2010. *Notes*: After-tax income. Figures adjusted for underreporting following the approach by D'Alessio and Neri (2015).

Table 3

COMPOSITION OF HOUSEHOLD PORTFOLIOS

(percent)

By wealth

	Assets							Liabilities			
	Real		Financial					Financial			
Household group within net wealth distribution	Housing	Firm ownership	Deposits	Government bonds	Shares and other equities	Credits from other households	Total	Bank debt	commercial debt	debt toward other households	Total
0-10%	89.5%	4.9%	3.1%	0.7%	1.7%	0.1%	100%	99.1%	0.1%	0.8%	100%
10-20%	65.0%	4.8%	16.0%	4.2%	9.0%	1.1%	100%	98.8%	0.4%	0.7%	100%
20-30%	64.1%	2.4%	8.3%	15.5%	9.5%	0.2%	100%	99.4%	0.1%	0.5%	100%
30-40%	73.1%	2.6%	10.6%	7.1%	6.3%	0.2%	100%	99.1%	0.6%	0.3%	100%
40-50%	70.7%	5.5%	7.8%	8.3%	5.5%	2.2%	100%	93.0%	6.9%	0.2%	100%
50-60&	76.2%	2.0%	9.4%	6.7%	5.3%	0.4%	100%	96.4%	2.4%	1.1%	100%
60-70%	74.0%	3.5%	9.8%	6.4%	5.5%	0.9%	100%	94.7%	4.1%	1.2%	100%
70-80%	71.4%	2.5%	10.8%	5.4%	9.0%	0.9%	100%	97.1%	2.1%	0.8%	100%
80_90%	71.7%	4.0%	10.3%	4.9%	8.8%	0.2%	100%	96.5%	2.9%	0.6%	100%
90-100%	44.9%	10.4%	6.0%	3.8%	33.8%	1.1%	100%	86.4%	13.2%	0.4%	100%

By income

	Assets							Liabilities			
	Real		Financial					Financial			
Household group within income distribution	Housing	Firm ownership	Deposits	Government bonds	Shares and other equities	Credits from other households	Total	Bank debt	commercial debt	debt toward other households	Total
0-10%	29.8%	40.4%	1.7%	6.5%	21.2%	0.4%	100%	96.9%	1.1%	2.0%	100%
10-20%	60.3%	6.5%	9.9%	12.9%	9.9%	0.4%	100%	95.9%	0.3%	3.8%	100%
20-30%	61.5%	3.3%	7.7%	7.6%	19.5%	0.3%	100%	95.7%	2.0%	2.3%	100%
30-40%	68.8%	2.5%	8.7%	8.8%	10.7%	0.5%	100%	98.2%	1.1%	0.7%	100%
40-50%	68.6%	5.2%	9.1%	7.3%	8.8%	1.0%	100%	98.7%	0.5%	0.8%	100%
50-60&	59.7%	3.3%	8.1%	7.7%	19.7%	1.5%	100%	89.7%	9.1%	1.2%	100%
60-70%	70.2%	4.2%	9.6%	7.1%	8.8%	0.2%	100%	99.0%	0.5%	0.5%	100%
70-80%	58.1%	5.9%	8.0%	5.2%	22.1%	0.6%	100%	96.0%	3.5%	0.5%	100%
80_90%	59.1%	6.8%	8.8%	4.6%	19.4%	1.4%	100%	98.9%	0.8%	0.4%	100%
90-100%	52.7%	12.1%	8.7%	4.6%	20.3%	1.6%	100%	93.3%	6.5%	0.1%	100%

Source: Banca d'Italia, Survey of Household Income and Wealth, 2010. *Notes*: Figures adjusted for underreporting following the approach by D'Alessio and Neri (2015).

Table 4

WEALTH AND DEBT RATIOS

(percent, unless otherwise indicated)

By wealth

Household group within net wealth distribution	Debt / Asset	Net wealth / Income	Real asset / Asset
0-10%	115.5%	-0.3	94.7%
10-20%	51.2%	0.7	72.3%
20-30%	23.2%	2.6	67.4%
30-40%	15.9%	4.1	76.3%
40-50%	16.5%	5.0	78.3%
50-60&	8.5%	6.5	78.8%
60-70%	9.7%	7.1	78.5%
70-80%	9.9%	8.0	74.9%
80_90%	5.7%	9.2	76.2%
90-100%	3.7%	15.1	56.3%
Total	8.6%	8.1	67.8%

By income

Household group within income distribution	Debt / Asset	Net wealth / Income	Real asset / Asset
0-10%	17.2%	11.7	70.2%
10-20%	4.5%	5.7	66.9%
20-30%	6.6%	6.9	64.8%
30-40%	6.9%	7.5	71.3%
40-50%	10.0%	7.4	73.8%
50-60&	17.0%	7.5	63.0%
60-70%	10.6%	7.2	74.3%
70-80%	9.8%	9.0	64.0%
80_90%	7.1%	9.6	65.9%
90-100%	7.5%	11.1	64.8%
Total	9.0%	9.0	66.6%

Source: Banca d'Italia, Survey of Household Income and Wealth, 2010. *Notes*: Figures adjusted for underreporting following the approach by D'Alessio and Neri (2015).

Table 5

DISTRIBUTIONAL EFFECTS OF AN UNCONVENTIONAL MONETARY EXPANSION UNDER MARKET STRESS (ECB 2011-2012 POLICY EXPANSION)

(percent)

By wealth

Household group within net wealth distribution	Non-financial earnings (A) increase in % of total income	*memo: with homogeneous elasticity of labour earnings*	Interest income and debt service (B) increase in % of total income	Capital gains (C) in % of gross wealth	Overall impact on Income (A+B) % increase	Overall impact on net wealth (**) % increase
0-10%	3.6	*1.7*	3.2	1.7	6.8	5.7
10-20%	1.3	*1.5*	0.9	2.5	2.1	5.2
20-30%	1.1	*1.3*	0.5	3.8	1.6	4.8
30-40%	0.7	*1.3*	0.3	2.7	1.0	3.0
40-50%	0.7	*1.3*	0.6	2.8	1.3	3.1
50-60&	0.6	*1.3*	-0.3	2.6	0.3	2.6
60-70%	0.3	*1.3*	-0.2	2.6	0.0	2.6
70-80%	0.5	*1.3*	-0.3	2.9	0.2	2.9
80_90%	0.5	*1.4*	-0.9	2.8	-0.4	2.6
90-100%	0.6	*1.4*	-0.9	5.5	-0.3	5.4

By income

Household group within income distribution	Non-financial earnings (A) increase in % of total income	*memo: with homogeneous elasticity of labour earnings*	Interest income and debt service (B) increase in % of total income	Capital gains (C) in % of gross wealth	Overall impact on Income (A+B) % increase	Overall impact on net wealth (**) % increase
0-10%	6.1	*0.9*	-0.7	3.4	5.4	3.3
10-20%	1.7	*0.9*	0.1	3.8	1.8	3.9
20-30%	1.0	*1.1*	-0.3	3.3	0.7	3.1
30-40%	0.4	*1.2*	-0.7	3.2	-0.3	3.1
40-50%	0.6	*1.3*	-0.5	3.4	0.1	3.3
50-60&	0.7	*1.4*	0.3	3.0	1.1	3.2
60-70%	0.4	*1.6*	0.4	2.9	0.8	3.1
70-80%	0.8	*1.7*	0.0	3.4	0.7	3.4
80_90%	0.3	*1.7*	-0.1	3.9	0.2	3.9
90-100%	0.6	*2.0*	-0.3	4.9	0.3	5.0

Notes: Responses to the monetary shock reported in the first column of Table 1. (**) Changes in net wealth include capital gains on the existing stock of real and financial assets plus savings out of additional earnings and financial income. Assumptions on propensity to consume of disposable income based on Bartiloro and Rampazzi (2013).

Table 6

INEQUALITY MEASURES

	Level				Deviation from baseline			
	baseline (observed in 2010)	Non-standard (2011-2013) monetary policy	Conventional monetary policy	Asset Purchase Programme	Non-standard (2011-2013) monetary policy	Conventional monetary policy	Asset Purchase Programme	*memo: historical year-to-year standard deviation 1995-2012*
				Wealth inequality				
GINI	0.609	0.613	0.610	0.608	0.003	0.001	-0.001	*0.0391*
					0.001	*0.001*	*0.001*	
p90/p10	157.25	151.5	149.6	150.6	-5.715	-7.672	-6.699	*94.376*
					6.029	*11.092*	*10.410*	
p75/p25	6.23	6.134	6.22	6.148	-0.096	-0.010	-0.082	*1.4526*
					0.077	*0.086*	*0.097*	
				Income inequality				
GINI	0.392	0.391	0.392	0.392	0.000	0.000	0.000	*0.0248*
					0.001	*0.001*	*0.001*	
p90/p10	5.96	5.93	5.98	5.977	-0.029	0.021	0.017	*0.545*
					0.068	*0.080*	*0.096*	
p75/p25	2.57	2.54	2.58	2.58	-0.014	0.020	0.024	*0.094*
					0.021	*0.029*	*0.034*	
				Labour income inequality				
GINI	0.410	0.408	0.408	0.407	-0.002	-0.002	-0.003	*0.0192*
					0.001	*0.001*	*0.000*	
p90/p10	7.44	7.32	7.32	7.31	-0.125	-0.125	-0.129	*0.294*
					0.117	*0.141*	*0.159*	
p75/p25	2.72	2.64	2.64	2.64	-0.080	-0.080	-0.077	*0.09*
					0.029	*0.033*	*0.033*	

Notes: Bootstrapped standard errors in italics below the figures. Standard errors only account for the sampling variability of the SHIW sample, while they rule out uncertainty associated with the correction for underreporting and non response, the estimation of the macroeconomic effects of monetary policy and the mapping of changes in macroeconomic conditions onto individual labour earnings.

Table 7

EFFECTS ON 'SAVERS' AND 'BORROWERS'

(percent)

Household group within net wealth distribution	Main scenario (Non standard policy expansion)				Conventional policy expansion			
	Impact on net wealth		Impact on income		Impact on net wealth		Impact on income	
	Savers	*Borrowers*	*Savers*	*Borrowers*	*Savers*	*Borrowers*	*Savers*	*Borrowers*
0-10%	2.8	11.0	4.3	10.1	2.0	21.6	4.2	15.2
10-20%	3.6	11.9	0.7	6.4	1.7	23.7	0.2	9.7
20-30%	4.5	5.6	-0.1	6.5	2.4	9.0	-1.3	9.5
30-40%	2.7	4.3	-0.3	3.9	2.3	6.0	-1.7	5.8
40-50%	2.5	4.9	-0.5	4.9	2.4	5.6	-2.0	7.1
50-60&	2.5	2.8	-0.8	4.9	2.4	4.7	-2.7	7.1
60-70%	2.4	3.3	-1.2	5.5	2.2	5.0	-3.3	8.9
70-80%	2.8	3.5	-1.1	5.4	2.5	5.6	-3.5	8.3
80-90%	2.7	2.2	-1.0	3.4	2.5	3.7	-3.3	4.9
90-100%	5.8	1.5	-1.0	4.5	4.2	2.3	-3.5	6.5
Total	4.2	3.0	-0.6	5.4	3.3	4.6	-2.6	8.0

Notes: Average responses of each group to the monetary shock reported in the first and second column of Table 1. 'Savers' are defined as households with strictly positive net financial assets holdings.

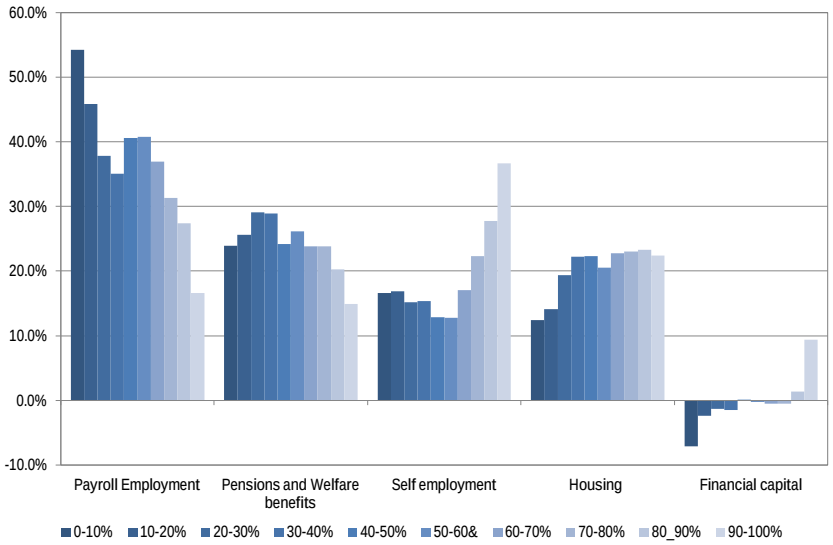
FIGURES

Figure 1

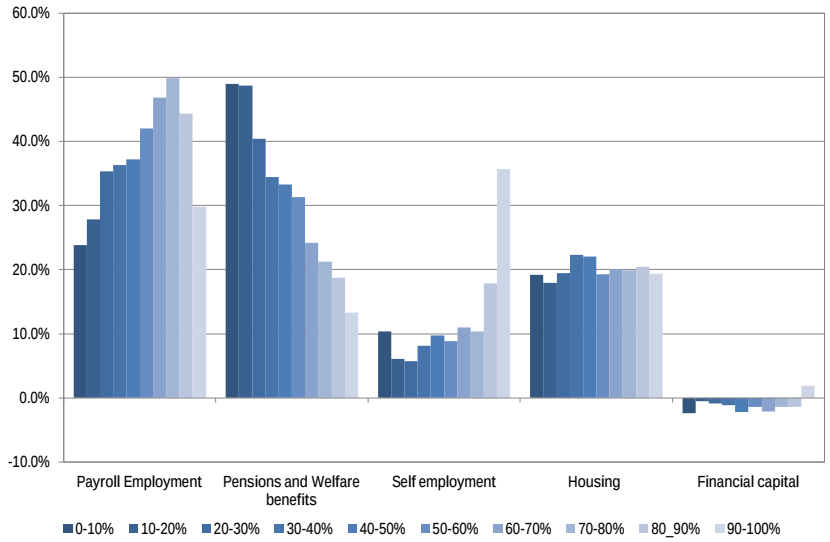
COMPOSITION OF HOUSEHOLD INCOME

(percent)

By wealth



By income



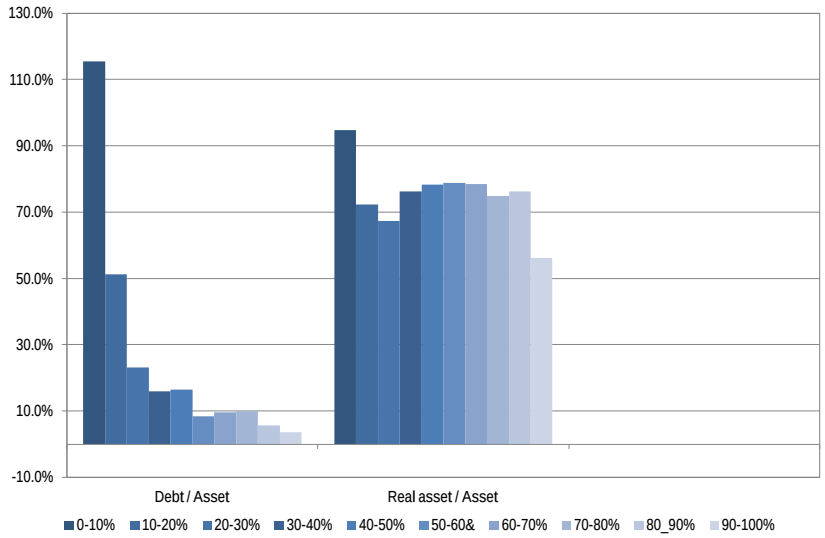
Source: Banca d'Italia, Survey of Household Income and Wealth, 2010. *Notes*: After-tax income. Figures adjusted for underreporting following the approach by D'Alessio and Neri (2015).

Figure 2

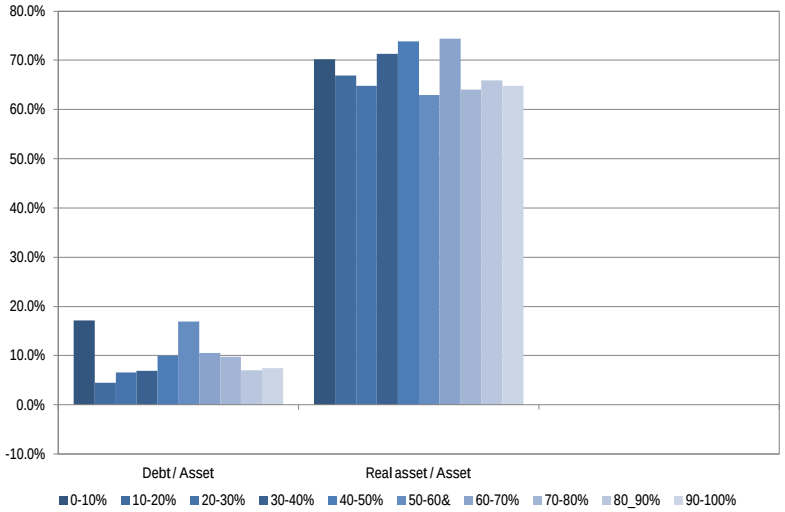
DEBT AND WEALTH RATIOS

(percent)

By wealth



By income



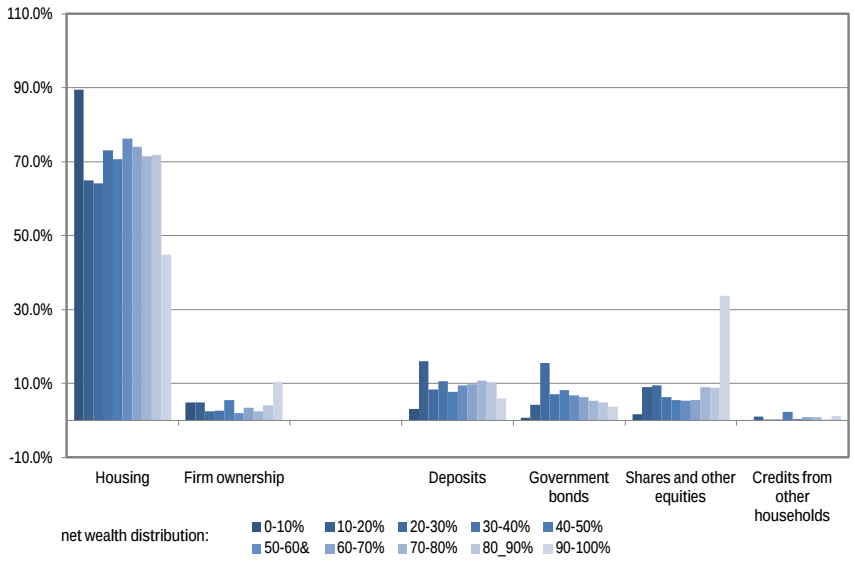
Source: Banca d'Italia, Survey of Household Income and Wealth, 2010. *Notes*: Figures adjusted for underreporting following the approach by D'Alessio and Neri (2015).

Figure 3

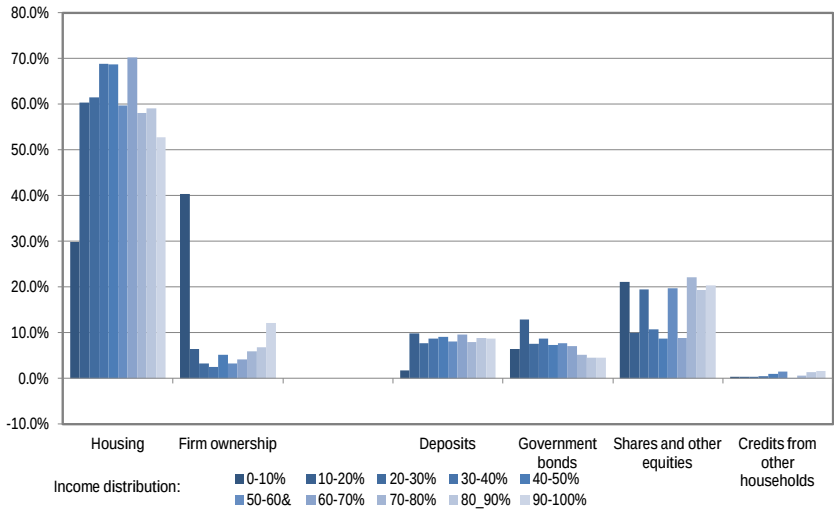
COMPOSITION OF HOUSEHOLD ASSETS

(percent)

By wealth



By income



Source: Banca d'Italia, Survey of Household Income and Wealth, 2010. *Notes*: Figures adjusted for underreporting following the approach by D'Alessio and Neri (2015).

Figure 4

Distributional effects of an unconventional expansion under market stress (ECB 2011-2012 policy expansion)

Household groups within net wealth distribution

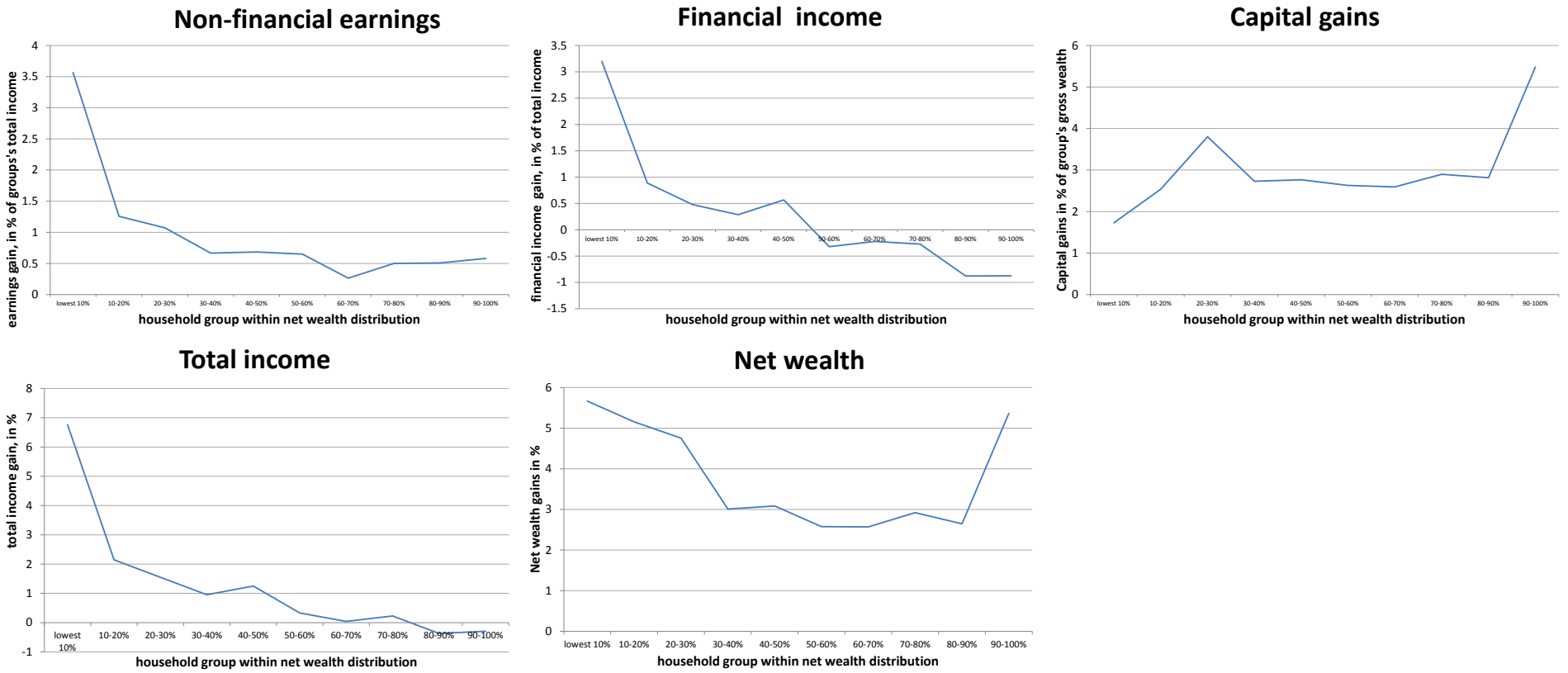
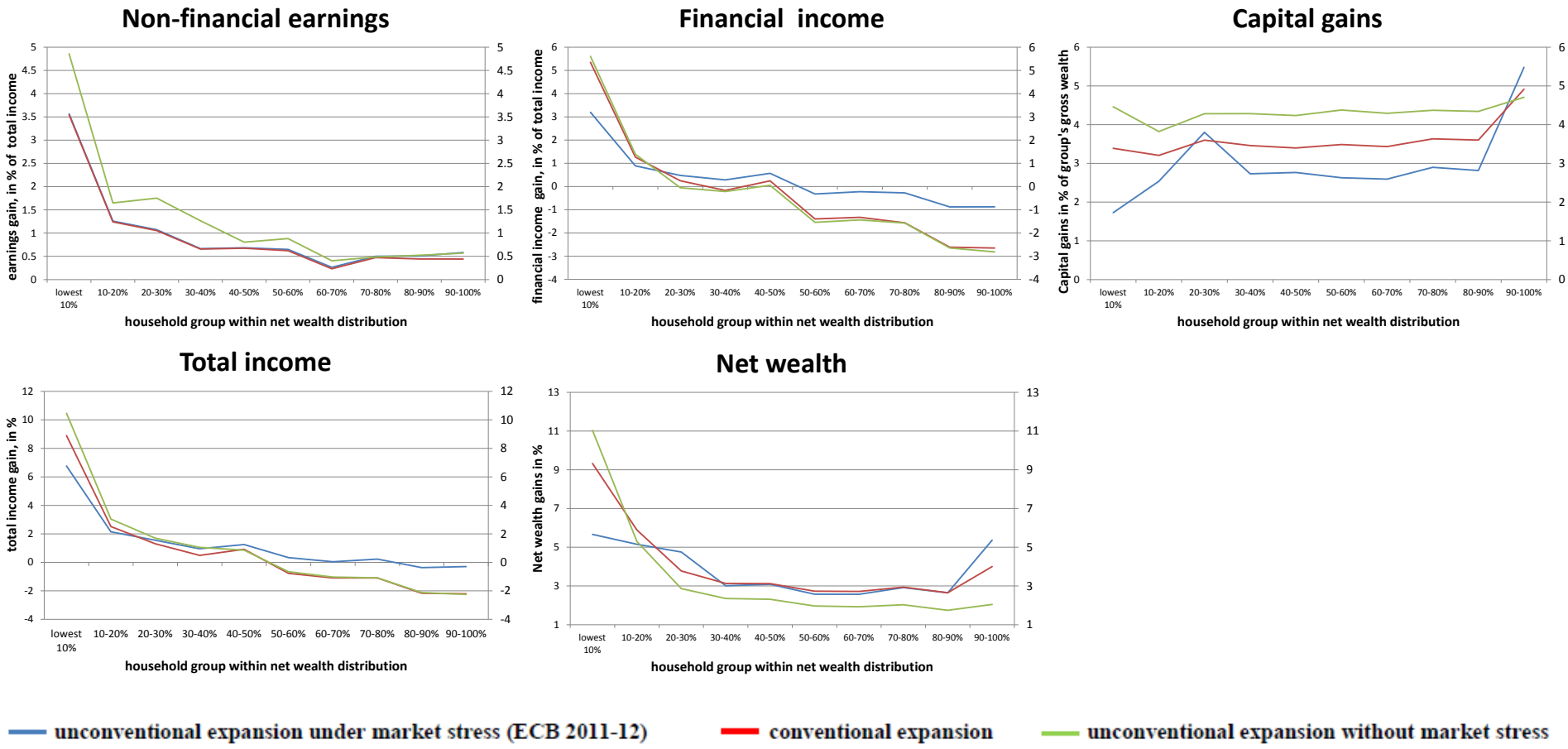


Figure 4b

Distributional effects of conventional and unconventional monetary policy expansions

Household groups within net wealth distribution



Notes: Blue line: unconventional expansion under market stress (ECB 2011-2012 policy expansion). Red line: conventional monetary expansion. Green line: unconventional expansion without market stress (asset purchase programme).

Figure 5

Distributional effects of an unconventional expansion under market stress (ECB 2011-2012 policy expansion)

Household groups within income distribution

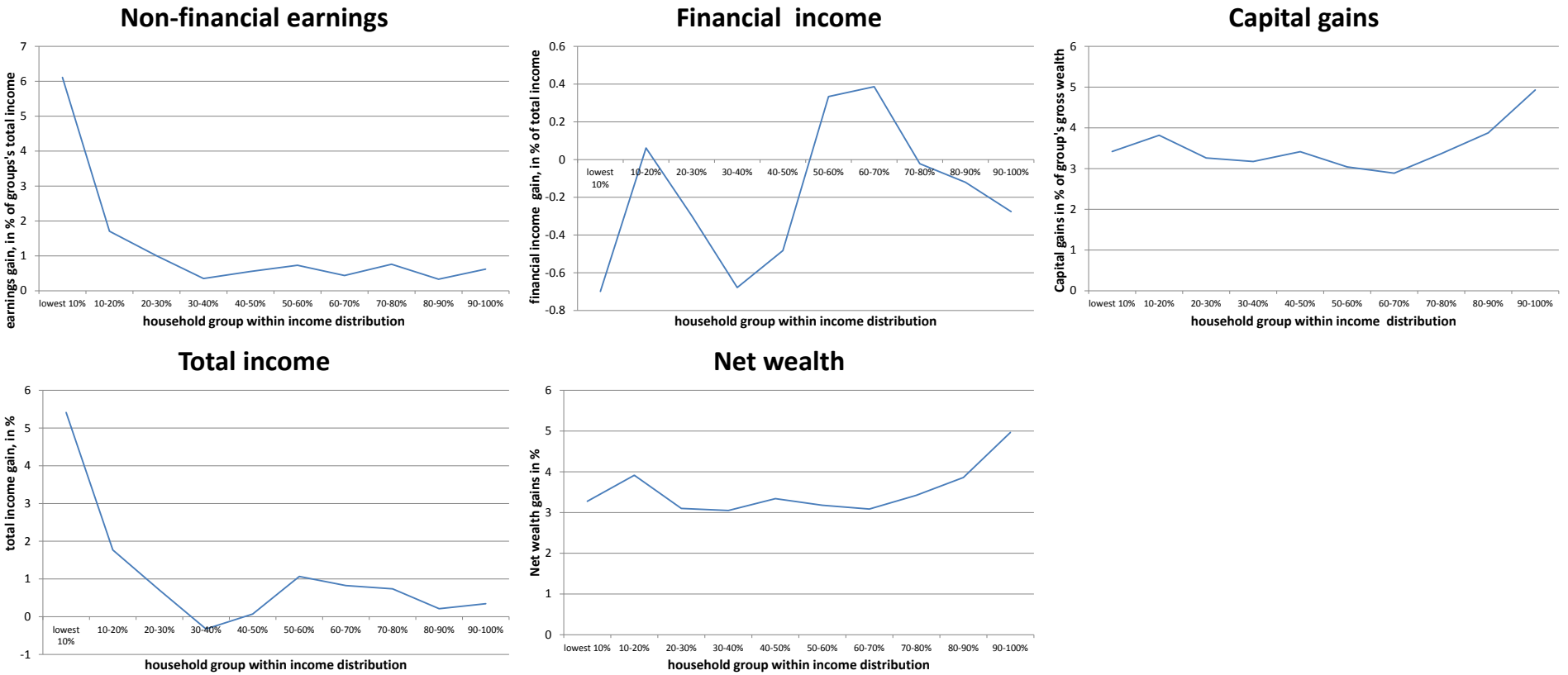
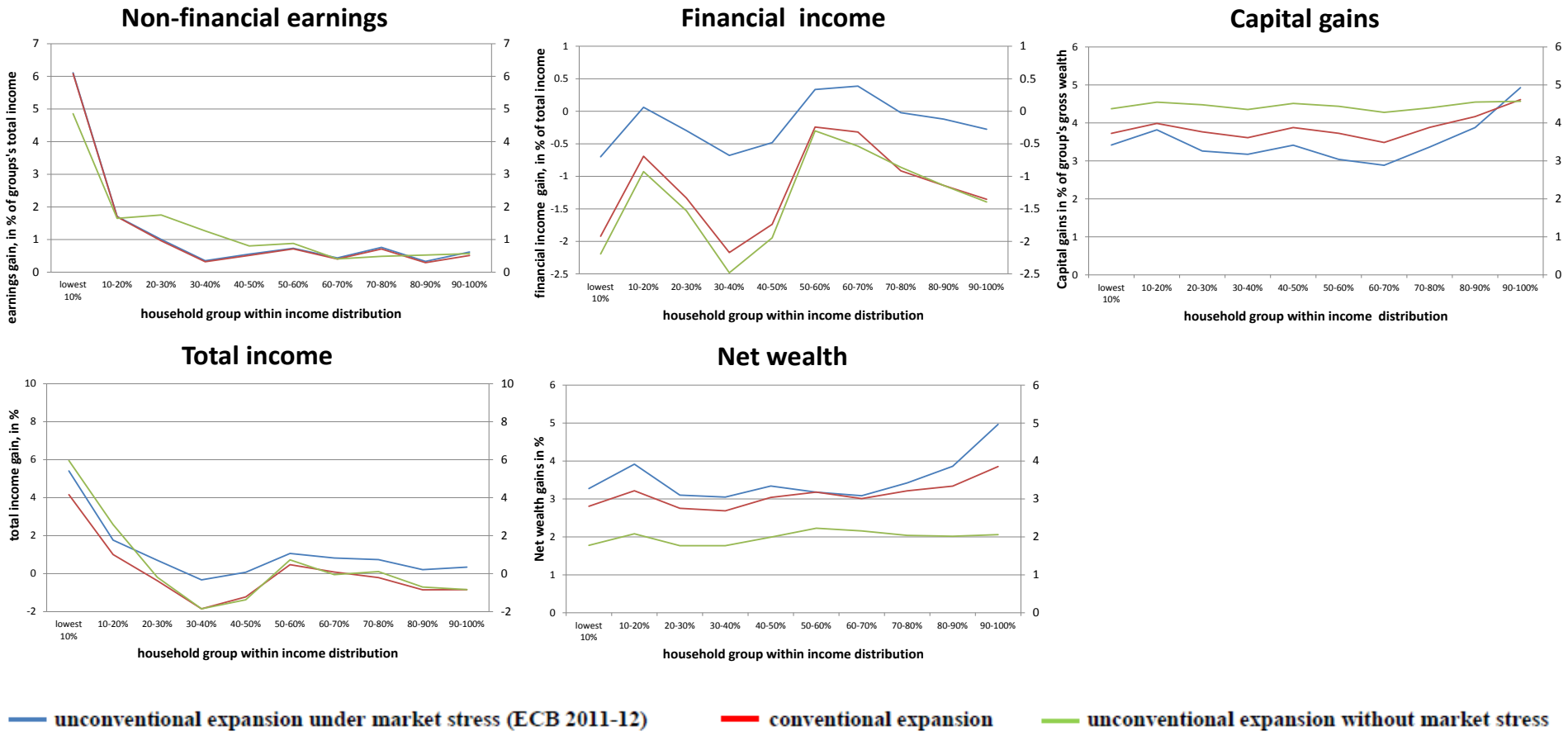


Figure 5b

Distributional effects of conventional and unconventional monetary policy expansions

Household groups within income distribution



Notes: Blue line: unconventional expansion under market stress (ECB 2011-2012 policy expansion). Red line: conventional monetary expansion. Green line: unconventional expansion without market stress (asset purchase programme).

APPENDIX

EU-SILC (European Union Statistics on Income and Living Conditions) is a yearly sample survey, coordinated by Eurostat, based on data from the EU member states. EU-SILC provides data on income, poverty, social exclusion and living conditions. Social exclusion and housing-condition information is collected at household level, while information on income is collected at personal level. Labour, education and health observations only apply to persons aged 16 and over.

The database includes both cross-sectional and longitudinal data. In particular, individuals are followed for four years before they get replaced. With respect to our analysis, we use the data on Italian households from 2004 to 2013 and specifically on its panel component. In other words, our dataset only includes individuals participating in the survey for 4 consecutive years.

Table A.1 shows the results of a probit regression, whose dependent variable is the employment status of the individual, which is equal to 1 if she has worked for at least one month in the reference year and 0 otherwise. The covariates are the aggregate employment rate for the population in working age (between 15 and 64 years old, as measured by ISTAT), dummy variables associated with sex, two different age groups (workers up to and above 25 years old) and four categories of education level (corresponding to the highest ISCED level achieved, namely primary education, lower secondary education, upper secondary education, and tertiary education). The specification also includes the interaction terms between the aggregate employment rate and the dummy variable corresponding to individual characteristics. Looking at column (1), all the coefficients are statistically significant and their signs suggest that an increase in the aggregate employment rate is associated with a higher probability of having job for everyone. This positive effect becomes stronger as the education level increases, while it is weaker for women and people more than 25 years old. These results are qualitatively robust to replacing the aggregate employment rate with the fisrt difference in the logarithm of real GDP, as shown in column (2).

Table A.2 reports the estimates obtained by regressing real labour earnings per hour on real GDP, the same dummies corresponding to individual characteristics as in the previous specification and the relative interaction terms. According to the estimates, the higher is the real GDP, the higher are hourly labour earnings in real terms. Age and the education level also affect earnings positively, while women seem to obtain a smaller labour income when entering or rentering the job market.

Finally, the Table A.3 reports the results of the third regression, which relates the growth of real labour earnings per hour to the growth rate of real GDP (both these variables are expressed as first differences of their log values). The number of observations is smaller than that in tables A.1 and A.2 because we include only individuals who work full time for 4 consecutive years in order to better isolate the impact of the macroeconomic cycle on labour earnings, ruling out the effect associated with changes in the extensive margin. Not surprisingly, the elasticity of real labour earnings to real GDP is positive for everyone. At the same time, the effect is stronger for workers up to 25 years old (the coefficient is not statistically significant though) and women, while it decreases if the individual's education level is above that correspondent to primary school.

Table A.1

VARIABLES	(1) Employment status	(2) Employment status
Empl. Rate Aggregate (D.log GDP)	0.236*** (0.0193)	9.3630*** (0.8242)
female	8.844*** (0.467)	-0.5121*** (0.0083)
female#c.empl_rate_agg (D.log GDP)	-0.162*** (0.00810)	-4.1718*** (0.3426)
2.age_group	-4.250*** (0.777)	0.8880*** (0.0133)
2.age_group#c.empl_rate_agg_64 (D.log GDP)	0.0902*** (0.0134)	2.4322*** (0.5797)
2.educ	-3.129*** (0.890)	0.5393*** (0.0149)
3.educ	-4.125*** (0.871)	0.7919*** (0.0146)
4.educ	-6.849*** (0.952)	0.9624*** (0.0160)
2.educ#c.empl_rate_agg_64 (D.log GDP)	0.0638*** (0.0154)	1.4084** (0.6510)
3.educ#c.empl_rate_agg_64 (D.log GDP)	0.0857*** (0.0151)	2.2758*** (0.6370)
4.educ#c.empl_rate_agg_64 (D.log GDP)	0.136*** (0.0165)	4.3458*** (0.6887)
Constant	-15.06*** (1.115)	-1.3834*** (0.0188)
Observations	158266	117583

Notes: Columns (1) and (2) report the estimates obtained using the aggregate employment and the first difference in the logarithm of real GDP rate, respectively, as proxy for macroeconomic conditions. Standard errors in parentheses. (***) denotes statistical significance at 1% level, (**) at 5% and (*) at 10%. Age groups: 1. if age between 15 and 25, 2. if between 26 and 64; Education groups: 1. primary education, 2. lower secondary education, 3. (upper) secondary education, 4. tertiary education.

Table A.2

VARIABLES	(1) Real labour income per hour
Real gdp	0.000118*** (2.65e-05)
Female	-80.95*** (2.939)
2.educ	36.22*** (6.327)
3.educ	142.2*** (6.167)
4.educ	308.9*** (6.486)
2.age_group	246.7*** (5.472)
Constant	-14.54 (44.47)
Observations	90898

Notes: Standard errors in parentheses. (***) denotes statistical significance at 1% level, (**) at 5% and (*) at 10%. Age groups: 1. if age between 15 and 25, 2. if between 26 and 64; Education groups: 1. primary education, 2. lower secondary education, 3. (upper) secondary education, 4. tertiary education.

Table A.3

VARIABLES	(1) D. log real labour income per hour
female	-0.000662 (0.00434)
D.log_real_gdp	1.469*** (0.552)
female#cD.log_real_gdp	0.355** (0.172)
2.educ	-0.00608 (0.00998)
3.educ	0.00500 (0.00971)
4.educ	0.0144 (0.0101)
3.educ#cD.log_real_gdp	-0.944** (0.406)
4.educ#cD.log_real_gdp	-0.967** (0.396)
5.educ#cD.log_real_gdp	-0.633 (0.412)
2.age_group	-0.118*** (0.00979)
2.age_group#cD.log_real_gdp	-0.638 (0.405)
Constant	0.126*** (0.0134)
Observations	54475

Notes: Standard errors in parentheses. (***) denotes statistical significance at 1% level, (**) at 5% and (*) at 10%. Age groups: 1. if age between 15 and 25, 2. if between 26 and 64; Education groups: 1. primary education, 2. lower secondary education, 3. (upper) secondary education, 4. tertiary education.

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V. DI GACINTO, M. GOMELLINI, G. MICUCCI and M. PAGNINI, *Mapping local productivity advantages in Italy: industrial districts, cities or both?*, Journal of Economic Geography, v. 14, pp. 365–394, **TD No. 850 (January 2012).**

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M. PORQUEDDU and F. VENDITTI, *Do food commodity prices have asymmetric effects on euro area inflation,* Studies in Nonlinear Dynamics and Econometrics, v. 18, 4, pp. 419-443, **TD No. 878 (September 2012).**

S. FEDERICO, *Industry dynamics and competition from low-wage countries: evidence on Italy*, Oxford Bulletin of Economics and Statistics, v. 76, 3, pp. 389-410, **TD No. 879 (September 2012).**

F. D'AMURI and G. PERI, *Immigration, jobs and employment protection: evidence from Europe before and during the Great Recession,* Journal of the European Economic Association, v. 12, 2, pp. 432-464, **TD No. 886 (October 2012).**

M. TABOGA, *What is a prime bank? A euribor-OIS spread perspective,* International Finance, v. 17, 1, pp. 51-75, **TD No. 895 (January 2013).**

G. CANNONE and D. FANTINO, *Evaluating the efficacy of european regional funds for R&D,* Rassegna italiana di valutazione, v. 58, pp. 165-196, **TD No. 902 (February 2013).**

L. GAMBACORTA and F. M. SIGNORETTI, *Should monetary policy lean against the wind? An analysis based on a DSGE model with banking,* Journal of Economic Dynamics and Control, v. 43, pp. 146-74, **TD No. 921 (July 2013).**

M. BARIGOZZI, CONTI A.M. and M. LUCIANI, *Do euro area countries respond asymmetrically to the common monetary policy?,* Oxford Bulletin of Economics and Statistics, v. 76, 5, pp. 693-714, **TD No. 923 (July 2013).**

U. ALBERTAZZI and M. BOTTERO, *Foreign bank lending: evidence from the global financial crisis,* Journal of International Economics, v. 92, 1, pp. 22-35, **TD No. 926 (July 2013).**

R. DE BONIS and A. SILVESTRINI, *The Italian financial cycle: 1861-2011,* Cliometrica, v.8, 3, pp. 301-334, **TD No. 936 (October 2013).**

G. BARONE and S. MOCETTI, *Natural disasters, growth and institutions: a tale of two earthquakes,* Journal of Urban Economics, v. 84, pp. 52-66, **TD No. 949 (January 2014).**

D. PIANESELLI and A. ZAGHINI, *The cost of firms' debt financing and the global financial crisis,* Finance Research Letters, v. 11, 2, pp. 74-83, **TD No. 950 (February 2014).**

J. LI and G. ZINNA, *On bank credit risk: sytemic or bank-specific? Evidence from the US and UK,* Journal of Financial and Quantitative Analysis, v. 49, 5/6, pp. 1403-1442, **TD No. 951 (February 2015).**

A. ZAGHINI, *Bank bonds: size, systemic relevance and the sovereign,* International Finance, v. 17, 2, pp. 161-183, **TD No. 966 (July 2014).**

G. SBRANA and A. SILVESTRINI, *Random switching exponential smoothing and inventory forecasting,* International Journal of Production Economics, v. 156, 1, pp. 283-294, **TD No. 971 (October 2014).**

M. SILVIA, *Does issuing equity help R&D activity? Evidence from unlisted Italian high-tech manufacturing firms,* Economics of Innovation and New Technology, v. 23, 8, pp. 825-854, **TD No. 978 (October 2014).**

2015

G. DE BLASIO, D. FANTINO and G. PELLEGRINI, *Evaluating the impact of innovation incentives: evidence from an unexpected shortage of funds,* Industrial and Corporate Change, , v. 24, 6, pp. 1285-1314, **TD No. 792 (February 2011).**

M. BUGAMELLI, S. FABIANI and E. SETTE, *The age of the dragon: the effect of imports from China on firm-level prices*, Journal of Money, Credit and Banking, v. 47, 6, pp. 1091-1118, **TD No. 737 (January 2010).**

R. BRONZINI, *The effects of extensive and intensive margins of FDI on domestic employment: microeconomic evidence from Italy*, B.E. Journal of Economic Analysis & Policy, v. 15, 4, pp. 2079-2109, **TD No. 769 (July 2010).**

A. DI CESARE, A. P. STORK and C. DE VRIES, *Risk measures for autocorrelated hedge fund returns,* Journal of Financial Econometrics, v. 13, 4, pp. 868-895, **TD No. 831 (October 2011).**

G. BULLIGAN, M. MARCELLINO and F. VENDITTI, *Forecasting economic activity with targeted predictors,* International Journal of Forecasting, v. 31, 1, pp. 188-206, **TD No. 847 (February 2012).**

A. CIARLONE, *House price cycles in emerging economies,* Studies in Economics and Finance, v. 32, 1, **TD No. 863 (May 2012).**

D. FANTINO, A. MORI and D. SCALISE, *Collaboration between firms and universities in Italy: the role of a firm's proximity to top-rated departments,* Rivista Italiana degli economisti, v. 1, 2, pp. 219-251, **TD No. 884 (October 2012).**

A. BARDOZZETTI and D. DOTTORI, *Collective Action Clauses: how do they Affect Sovereign Bond Yields?,* Journal of International Economics , v 92, 2, pp. 286-303, **TD No. 897 (January 2013).**

D. DEPALO, R. GIORDANO and E. PAPAPETROU, *Public-private wage differentials in euro area countries: evidence from quantile decomposition analysis,* Empirical Economics, v. 49, 3, pp. 985-1115, **TD No. 907 (April 2013).**

G. BARONE and G. NARCISO, *Organized crime and business subsidies: Where does the money go?,* Journal of Urban Economics, v. 86, pp. 98-110, **TD No. 916 (June 2013).**

P. ALESSANDRI and B. NELSON, *Simple banking: profitability and the yield curve,* Journal of Money, Credit and Banking, v. 47, 1, pp. 143-175, **TD No. 945 (January 2014).**

M. TANELI and B. OHL, *Information acquisition and learning from prices over the business cycle,* Journal of Economic Theory, 158 B, pp. 585–633, **TD No. 946 (January 2014).**

R. AABERGE and A. BRANDOLINI, *Multidimensional poverty and inequality,* in A. B. Atkinson and F. Bourguignon (eds.), Handbook of Income Distribution, Volume 2A, Amsterdam, Elsevier, **TD No. 976 (October 2014).**

V. CUCINIELLO and F. M. SIGNORETTI, *Large banks,loan rate markup and monetary policy,* International Journal of Central Banking, v. 11, 3, pp. 141-177, **TD No. 987 (November 2014).**

M. FRATZSCHER, D. RIMEC, L. SARNOB and G. ZINNA, *The scapegoat theory of exchange rates: the first tests,* Journal of Monetary Economics, v. 70, 1, pp. 1-21, **TD No. 991 (November 2014).**

A. NOTARPIETRO and S. SIVIERO, *Optimal monetary policy rules and house prices: the role of financial frictions,* Journal of Money, Credit and Banking, v. 47, S1, pp. 383-410, **TD No. 993 (November 2014).**

R. ANTONIETTI, R. BRONZINI and G. CAINELLI, *Inward greenfield FDI and innovation,* Economia e Politica Industriale, v. 42, 1, pp. 93-116, **TD No. 1006 (March 2015).**

T. CESARONI, *Procyclicality of credit rating systems: how to manage it,* Journal of Economics and Business, v. 82. pp. 62-83, **TD No. 1034 (October 2015).**

M. RIGGI and F. VENDITTI, *The time varying effect of oil price shocks on euro-area exports,* Journal of Economic Dynamics and Control, v. 59, pp. 75-94, **TD No. 1035 (October 2015).**

2016

E. BONACCORSI DI PATTI and E. SETTE, *Did the securitization market freeze affect bank lending during the financial crisis? Evidence from a credit register,* Journal of Financial Intermediation , v. 25, 1, pp. 54-76, **TD No. 848 (February 2012).**

M. MARCELLINO, M. PORQUEDDU and F. VENDITTI, *Short-Term GDP Forecasting with a mixed frequency dynamic factor model with stochastic volatility,* Journal of Business & Economic Statistics , v. 34, 1, pp. 118-127, **TD No. 896 (January 2013).**

M. ANDINI and G. DE BLASIO, *Local development that money cannot buy: Italy's Contratti di Programma,* Journal of Economic Geography, v. 16, 2, pp. 365-393, **TD No. 915 (June 2013).**

L. ESPOSITO, A. NOBILI and T. ROPELE, *The Management of Interest Rate Risk During the Crisis: Evidence from Italian Banks,* Journal of Banking & Finance, v. 59, pp. 486-504, **TD No. 933 (September 2013).**

F. BUSETTI and M. CAIVANO, *The Trend–Cycle Decomposition of Output and the Phillips Curve: Bayesian Estimates for Italy and the Euro Area,* Empirical Economics, V. 50, 4, pp. 1565-1587, **TD No. 941 (November 2013).**

M. CAIVANO and A. HARVEY, *Time-series models with an EGB2 conditional distribution,* Journal of Time Series Analysis, v. 35, 6, pp. 558-571, **TD No. 947 (January 2014).**

G. ALBANESE, G. DE BLASIO and P. SESTITO, *My parents taught me. evidence on the family transmission of values,* Journal of Population Economics, v. 29, 2, pp. 571-592, **TD No. 955 (March 2014).**

R. BRONZINI and P. PISELLI, *The impact of R&D subsidies on firm innovation,* Research Policy, v. 45, 2, pp. 442-457, **TD No. 960 (April 2014).**

L. BURLON and M. VILALTA-BUFI, *A new look at technical progress and early retirement,* IZA Journal of Labor Policy, v. 5, **TD No. 963 (June 2014).**

A. BRANDOLINI and E. VIVIANO, *Behind and beyond the (headcount) employment rate,* Journal of the Royal Statistical Society: Series A, v. 179, 3, pp. 657-681, **TD No. 965 (July 2015).**

D. DOTTORI and M. MANNA, *Strategy and Tactics in Public Debt Management,* Journal of Policy Modeling, v. 38, 1, pp. 1-25, **TD No. 1005 (March 2015).**

A. CALZA and A. ZAGHINI, *Shoe-leather costs in the euro area and the foreign demand for euro banknotes,* International Journal of Central Banking, v. 12, 1, pp. 231-246, **TD No. 1039 (December 2015).**

E. CIANI, *Retirement, Pension Eligibility and Home Production,* Labour Economics, v. 38, pp. 106-120, **TD No. 1056 (March 2016).**

L. D'AURIZIO and D. DEPALO, *An Evaluation of the Policies on Repayment of Government's Trade Debt in Italy,* Italian Economic Journal, v. 2, 2, pp. 167-196, **TD No. 1061 (April 2016).**

FORTHCOMING

S. MOCETTI, M. PAGNINI and E. SETTE, *Information technology and banking organization,* Journal of Financial Services Research, **TD No. 752 (March 2010).**

F BRIPI, *The role of regulation on entry: evidence from the Italian provinces,* World Bank Economic Review, **TD No. 932 (September 2013).**

G. DE BLASIO and S. POY, *The impact of local minimum wages on employment: evidence from Italy in the 1950s,* Regional Science and Urban Economics, **TD No. 953 (March 2014).**

A. L. MANCINI, C. MONFARDINI and S. PASQUA, *Is a good example the best sermon? Children's imitation of parental reading,* Review of Economics of the Household, **TD No. 958 (April 2014).**

L. BURLON, *Public expenditure distribution, voting, and growth,* Journal of Public Economic Theory, **TD No. 961 (April 2014).**

G. ZINNA, *Price pressures on UK real rates: an empirical investigation,* Review of Finance, **TD No. 968 (July 2014).**

A. BORIN and M. MANCINI, *Foreign direct investment and firm performance: an empirical analysis of Italian firms,* Review of World Economics, **TD No. 1011 (June 2015).**

F. CORNELI and E. TARANTINO, *Sovereign debt and reserves with liquidity and productivity crises,* Journal of International Money and Finance, **TD No. 1012 (June 2015).**