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**HOUSING AND EQUITY  
WEALTH EFFECTS OF  
ITALIAN HOUSEHOLDS**

by Charles Grant  
and Tuomas A. Peltonen



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# HOUSING AND EQUITY WEALTH EFFECTS OF ITALIAN HOUSEHOLDS<sup>1</sup>

by Charles Grant<sup>2</sup>  
and Tuomas A. Peltonen<sup>3</sup>



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<sup>2</sup> University of Reading, Whiteknights, Reading, RG6 6AH, United Kingdom; e-mail: [c.grant@reading.ac.uk](mailto:c.grant@reading.ac.uk)

<sup>3</sup> Corresponding author: DG International and European Relations, European Central Bank, Kaiserstrasse 29, 60311 Frankfurt am Main, Germany; e-mail: [tuomas.peltonen@ecb.int](mailto:tuomas.peltonen@ecb.int)



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**Address**

Kaiserstrasse 29  
60311 Frankfurt am Main, Germany

**Postal address**

Postfach 16 03 19  
60066 Frankfurt am Main, Germany

**Telephone**

+49 69 1344 0

**Website**

<http://www.ecb.europa.eu>

**Fax**

+49 69 1344 6000

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## Abstract

The study quantifies stock market and housing market wealth effects on households' non-durable consumption using Italian household panel data (SHIW) of 1989-2002. We found all households react similarly to aggregate housing and stock market gains. We also found statistically and economically significant housing wealth effects with a marginal propensity to consume out of idiosyncratic housing wealth gains to be over 8 percent. The results from idiosyncratic equity wealth effects were lower, at around 0.4 percent. We also found that older households react more to changes in housing wealth.

*JEL classification:* D12, E21

*Keywords:* Marginal Propensity to Consume, Housing, Equities

## Non-technical summary

During the 1990s, households in many advanced economies experienced rapid rises in their net wealth, largely driven by sharp increases in asset valuations. In most cases, this development was accompanied by a decline in the household saving rate, sparking a considerable debate as to whether these two developments were related. Another coinciding development in many advanced countries was the rapid increase in the households' participation in risky asset markets, as households increased their investments in equities, either directly or indirectly through mutual funds. As a consequence, the share of financial wealth in households' total net worth has increased. According to Boone and Girouard (2002), the share of financial wealth in G7 countries at the end of 1990s varied from around 46 percent (Japan) to 77 percent (the US), while the housing wealth accounted for around 4 percent (Japan) to 40 percent (France) of households' total wealth. Despite this development, it is important to note that most of the financial wealth, and especially equity wealth, is still held by the wealthiest population group, while housing wealth is more evenly distributed. According to the ECB (2003), the share of owner-occupied housing in European Union varies between 39 percent (Germany) and 85 percent (Spain), and averages 61 percent.

This study analyses housing and equity wealth effects on households' non-durable consumption using the Survey of Italian Household and Wealth (SHIW) published by Banca D'Italia. This dataset contains detailed information on Italian households' consumption, income and wealth from 1989-2002, and is constructed as a panel. The main contribution of our study is that, using the variation through time and across households, the idiosyncratic shocks to households' income and wealth can be identified. Furthermore, we analyse the consumption responses of different age and wealth groups of households. In addition, we also investigate indirect wealth effects, i.e. how different types of households react to aggregate equity and housing price changes.

Regarding *direct* wealth effects (those arising from the self-reported change in wealth), our results indicate that homeowners' consumption react statistically and economically significantly to *realized* housing wealth shocks (the estimated MPC is over 8 percent). This is slightly larger than in many US studies, where Peek (1983), Skinner (1984, 1986) and Engelhardt (1996) all found effects between 3 and 5 percent, but is in the range of estimates found by Disney *et al.* for the UK and by Hori and Shimizutani (2003) for Japan. Our results also indicate that the estimated *unrealized* equity wealth effects for stockowners, although statistically significant, are economically quite small, with an average MPC of 0.4 percent. The estimated effect is lower than estimates for other countries such as the US where Dynan and Maki (2001) estimated a MPC of 5-14 percent.

We additionally find that the estimated elasticity for 'old' (45-65 years old) households is larger (the estimated MPC is around 15 percent), whereas for 'younger' (25-44 years old) households, the estimated elasticity is smaller (around 5 percent), but not statistically significant. Unexpectedly, the estimated elasticity for the richest wealth group households is the largest (around 10 percent), but not statistically significantly different from the medium wealth group households' elasticity (around 7 percent). For the lowest wealth group household, the estimated elasticity is statistically not significant. One possible explanation is that binding credit-constraints are preventing households in the lowest wealth group households from increasing their consumption in response to housing wealth gains.

We also investigated the effect of the house-price and stockmarket indices. For these *indirect* wealth effects, we find no support for indirect housing wealth effects, whereas indirect equity

wealth effects are found to be statistically significant and economically large. The indirect equity wealth effects are likely to be related to expected improvements in income outlook, given that both stockholders and non-stockholders increase their consumption in response to positive stockmarket developments, and that the estimated coefficients between these two groups are found to be similar.

# 1 Introduction

During the 1990s, the G7 countries (with the exception of Japan) experienced rapid rises in households' net wealth, largely driven by sharp increases in asset valuations. In most cases, this development was accompanied by a decline in the household saving rate, sparking a considerable debate as to whether these two developments were related. Furthermore, the sizeable fluctuations in the major economies' asset prices during the past decades have also attracted extensive attention from policy makers. There are various reasons for this. Firstly, asset prices might have a direct impact on economic activity, mainly through wealth effects on consumption, and on investment through Tobin's Q and financial accelerator effects. Secondly, asset price fluctuations may pose a considerable risk to financial stability. Thirdly, as reported by Gilchrist and Leahy (2002), asset prices aggregate information from diverse sources in a timely matter, and might therefore be useful proxies of the underlying state of the economy, as well as for future economic activity.

Another coinciding development in many OECD countries during the 1990s was the rapid increase in the households' participation in risky asset markets, as households increased their investments in equities, either directly or indirectly through mutual funds. As reported by Guiso, Haliassos and Jappelli (2002), by the end of the 1990s, about 50 percent of households in the US and Sweden, and over 30 percent in the UK, were investing directly or indirectly in equities. In the Netherlands, Italy, France and Germany, the proportion was between 15 and 25 percent, but equity holdings had also increased significantly in these countries. As a consequence, the share of financial wealth in households' total net worth has increased. According to Boone and Girouard (2002), the share of financial wealth in G7 countries at the end of 1990s varied from around 46 percent (Japan) to 77 percent (the US), while the housing wealth accounted for around 4 percent (Japan) to 40 percent (France) of households' total wealth. Despite this development, it is important to note that most of the financial wealth, and especially equity wealth, is still held by the wealthiest population group, while housing wealth is more evenly distributed. According to the ECB (2003), the share of owner-occupied housing in European Union varies between 39 percent (Germany) and 85 percent (Spain), and averages 61 percent.

This study analyzes housing and equity wealth effects on households' non-durable consumption using the Survey of Italian Household and Wealth (SHIW) published by Banca D'Italia. This dataset contains detailed information on Italian households' consumption, income and wealth from 1989-2002, and is constructed as a panel.<sup>1</sup> The main contribution of our study is that, using the variation through time and across households, the idiosyncratic shocks to households' income and wealth can be identified. Therefore, our approach differs from many earlier studies, which have either used cohort or repeated cross-section data to address the question of how households react to wealth shocks. Secondly, we are able to identify stockowners and homeowners without the need to estimate "likely" stockowners or homeowners, as in some earlier studies. Thirdly, we can separate capital gains and losses from changes in saving behaviour, enabling us to focus on "true" wealth effects. Finally, we evaluate wealth effects using self-reported data instead of imputed values or aggregate returns, and our consumption measure is non-durable consumption, which is much broader than the often used 'food expenditure' proxy for non-durable consumption.

The paper is organized as follows: section 2 explains the particular features of the Italian housing and equity markets. We then discuss how our estimation strategy compares with earlier

<sup>1</sup>See e.g. Guiso and Jappelli (2002a) for further details on the data.

studies of the wealth effect from rising housing or equity values in section 3. The data is discussed in section 4 before we report and discuss our results in section 5.

## 2 Household Portfolios in Italy

The biannual Survey of Italian Household and Wealth (SHIW), published by Banca D'Italia, collects information about households' consumption, income and wealth. According to Banca D'Italia (2004), a report which is based on the 2002 cross-section of the SHIW, the median Italian household net wealth was 103,000 euros in 2002, defined as the sum of real assets (property, companies, and valuables), and financial assets (deposits, government securities, equity, etc.), net of financial liabilities (mortgages and other debts). Real assets constituted the largest share of net wealth with a median value of 100,000 euros, while the median value of financial assets was 7,066 euros. Higher values of financial assets were observed for households where the heads were university graduates (22,408 euros), managers (25,696 euros) or self-employed (15,858 euros). The value of financial assets varied significantly with the geographical location: 50 percent of households in the south and in the islands owned less than 2,732 euros in financial assets, against 11,134 euros in the north and 9,743 euros in the centre of Italy. On average, the stock of durable goods owned by households was 17,508 euros, of which 7,838 euros were in vehicles in 2002. Finally, the households' median net income was 27,868 euros in 2002.

In common with other major economies, Italy enjoyed a stock market boom in the second half of the 1990s and a bust at the beginning of this century (see figure 1). House prices also increased sharply during that time: hence a study of Italy can complement those of other countries. During 1989-2002, the average (nominal) annual returns for the Italian stock and housing markets were 7.9 percent and 6.7 percent, respectively.

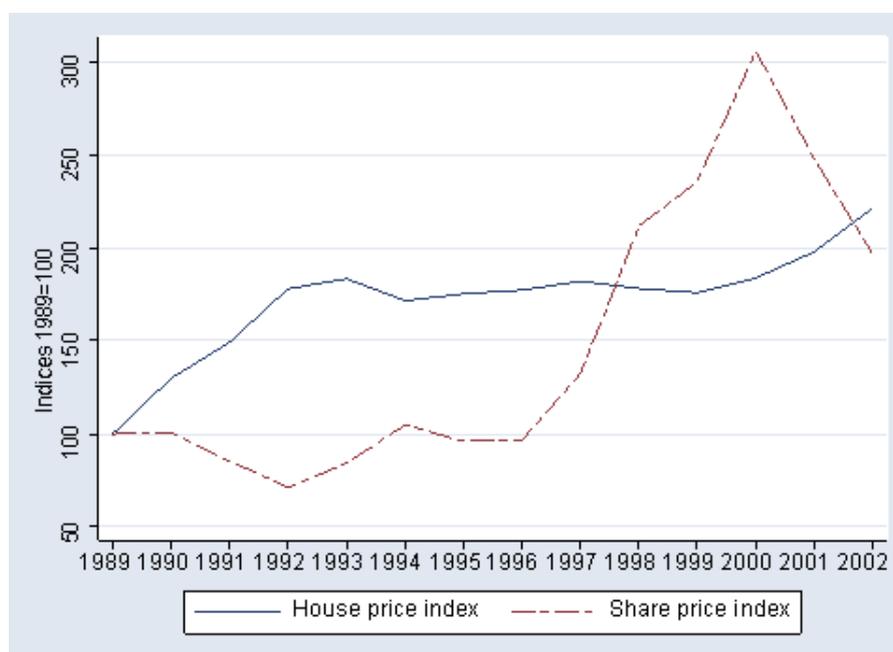


Figure 1: Italian housing and share price indices 1989-2002. Sources: Banca d'Italia and IMF IFS September 2004.

While the behaviour of Italian asset values has been similar to other countries, there are some unique features in the Italian market, especially in the housing market, which make comparisons between the behaviour of Italian households and households elsewhere particularly interesting.

A drawback to the study is that the direct stock market participation rate in Italy is still fairly low, and the data availability limits our ability to evaluate stock market wealth effects, therefore, motivating us to focus more on housing wealth effects. This seems sensible since, even in the Anglo-Saxon countries, housing typically forms a larger proportion of household assets than equities (but not necessarily financial wealth), and, as mentioned earlier, housing wealth is more evenly distributed across population than financial wealth.

## 2.1 Housing wealth

In the last four decades, the home-ownership rate in Italy has increased notably from 46 percent in 1961 to nearly 70 percent in 2003, and is currently above the European Union average.<sup>2</sup> According to Banca D'Italia (2004), in 2002, 68.5 percent of households were owner-occupiers; 20.9 percent were tenants; 10.6 percent were occupying under other arrangements. Although homeownership rates in Italy are not especially low by international standards, there are some features that make the housing market in Italy very different from the housing markets of other major economies. Chiuri and Jappelli (2003) showed that the household age-tenure profile in Italy sharply differs from the profiles in Anglo-Saxon countries and Scandinavia, since Italians typically buy their first home at older ages than elsewhere. By the age of 30, the home-ownership ratio in the Anglo-Saxon countries is around 40-50 percent, but is only 15-25 percent in Italy. This suggests there is considerable unmet housing demand in Italy.

The Italian mortgage market differs significantly from those in the other major economies and in the other EU countries. For example, according to the ECB (2003), mortgage debt in Italy in 2001 averaged only 10 percent of the GDP, whereas the EU average was 39 percent, and in the UK it was 60 percent. Of the EU countries, only Greece (at 12 percent of the GDP), among EU countries, has a similarly low mortgage ratio. Moreover, according to the European Mortgage Federation (2003), the average loan-to-value (LTV) rates are very low in Italy, just over 50%, while in the other EU countries, the average LTV varies between 70-90 percent.<sup>3</sup> Furthermore, mortgages in Italy have shorter terms, typically 10-15 years, while the interest rate margins are higher in Italy than elsewhere in Europe. Moreover, transaction costs, as well as loan processing times were higher than in the other EU countries. Finally, while mortgage equity withdrawal is in principle available in Italy, it is not commonly used, making Italy's housing wealth relatively illiquid compared not only to the equity wealth, but also to housing wealth in the UK and the US.

Part of the explanation for this under-development of the Italian mortgage market may be due to difficulties in foreclosing. On average it took lenders 48 months to foreclose a mortgage in Italy, but only 9 months in the US, and less than 5 months in the UK. Judicial inefficiency is likely to make lenders more reluctant to offer mortgages. Despite these facts, relatively few Italian households rent rather than own their home. In common with many other countries, homeownership confers tax advantages. Moreover, the rental market is highly regulated, which makes it difficult to alter the rent or to evict sitting tenants. This contributes to a reluctance to supply rental property.

The fact that the mortgage market is underdeveloped but homeownership rates are high in Italy suggests that households finance home purchases through means other than financial inter-

<sup>2</sup>According to the ECB (2003), the EU average homeownership rate was 61 percent.

<sup>3</sup>In 1987, the minimum downpayment ratio in Italy was regulated at 25 percent (a reduction from previous levels). In 1995, this limit was reduced to 20 percent. According to the European Mortgage Federation (2003), the maximum LTV ratio can even be 100% in France and Spain, 110% in the UK and 115% in the Netherlands.

mediaries in the formal lending sector. There must be offsetting factors, such as intergenerational transfers or substantial savings, that alleviate the impact of mortgage market imperfections on households' tenure decisions. In fact, both Engelhardt and Mayer (1998) and Guiso and Jappelli (2002b) found that bequests, gifts and other *inter vivos* transfers shorten the saving period before home ownership and increase the value of the home purchased. Guiso and Jappelli (2002b) found that about one-third of Italian homeowners report that they have received the home itself as a gift or as a bequest, or have received financial support for purchasing a dwelling. In the US, Engelhardt and Mayer (1998) found that one in five first-time home buyers receive financial transfers from friends or relatives to help to fund the first down payment, and these transfers typically account for more than half of the down payment. However, they conclude that gifts are a poor substitute for efficient credit markets.

## 2.2 Equity wealth

Although the stock market participation rate in Italy is lower than in the US and the UK, it is similar to other major European economies and its stock market capitalization is the fifth largest in Europe, making some of our results concerning equity wealth effects possibly relevant for other European economies as well.<sup>4</sup> Banca D'Italia (2004) reports that the direct stock market participation rate in Italy was about 9.6 percent in 2002. Including indirect participation through mutual funds and pension funds, the total participation rate increased to just over 20 percent in 2002.

Italian household portfolios, mainly based on the SHIW data, are well documented by Guiso and Jappelli (2002a) among others. These authors report a large shift towards riskier portfolios, and an increase in stock market and mutual funds participation in Italy during the 1990s. They also find that the increasing role of stock market investments is due, not only to the increase in the participation rate, but also (and of equal importance) to a sharp increase in the share of wealth invested. According to their study, the portfolio shift towards direct and indirect stock holding resulted from several factors. These include privatization of public companies, growth in the Italian stock market, reduction of Italian Treasury bill returns, and changes in the social security system that lowered workers' expected future income. Finally, increased competition among financial firms offering investment services reduced entry costs and financial information costs, while the greater availability of new financial products further increased Italians' interest in stocks.

Due to increased involvement in the stock market, the total stock market participation rate in Italy is approximately equal to the participation rate in the other major continental European countries such as France (23 percent) and the Netherlands (24 percent). However, it is still far below rates in Sweden (54 percent), the UK (34 percent), and the US (48 percent), as reported by Guiso, Haliassos and Jappelli (2002). Mutual funds and other managed investments in Italy accounted for 15 percentage points of the total stock market participation rate in 2002 (peak in 1999, 20 percent). In the 1980s, direct stockholdings accounted for only about 15 percent of households' financial assets, and indirect holdings through mutual funds were virtually absent (mutual funds were introduced in 1984; see Guiso and Jappelli (2002a)).

Guiso and Jappelli (2002a) also found that the age profile of stock market participation is hump shaped, with a peak around the age of 50, and that participation is generally correlated

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<sup>4</sup>At the end of March 2005, stock market capitalizations in the UK, France, Germany and Spain were larger than in Italy.

with education. Stock market participation is low among households below median financial wealth levels, and even in the highest quartile of the wealth distribution, it is only slightly above 50 percent. On the other hand, the correlations between the amount invested in stocks and age, education, or financial wealth are generally weak.

### 3 Theoretical Considerations

Many studies have estimated the marginal propensity to consume (henceforth MPC) out of income and wealth. The two most common assets that have been explicitly studied are housing wealth and equities. Before moving to the empirical issues, we will recapitulate the theory with the assumptions made in earlier papers. Most studies have either implicitly or explicitly employed an Euler equation format. However, although the theoretical basis of the analysis is the life-cycle model, we emphasize that our purpose is not to test the validity of this model; instead, we are interested in quantifying the MPCs from different wealth shocks and for different types of households. Therefore, our models should be interpreted as reduced form equations.

We will concentrate on changes in the value of assets, i.e. 'windfall gains'. Thus, we will report the results for the regression of changes in non-durable consumption  $c_{it}$  for household  $i$  at time  $t$  against changes in income  $y_{it}$ , housing wealth  $W_{it}^h$ , and (listed) equity wealth  $W_{it}^s$ . That is, for those households that hold the relevant wealth item, the regressions take the form:

$$\Delta \ln c_{it} = \alpha_0 + \alpha_1 r_t + \alpha_2 \Delta \omega_{it} + \alpha_3 \Delta \ln y_{it} + \alpha_4 \Delta \ln W_{it}^h + \alpha_5 \Delta \ln W_{it}^s + \epsilon_{it} \quad (1)$$

where  $r_t$  is the risk-free rate of return time at time  $t$ ,  $\omega$  represent a set of household characteristics that affect tastes and hence shift consumption, while  $\epsilon_{it}$  represents idiosyncratic changes in consumption that are not captured through the explanatory variables.

Rational expectations and arbitrage opportunities imply that changes in the value of assets at time  $t$  are not predictable at  $t - 1$ . Changes in income, on the other hand, may well be predictable. Moreover, in contrast to equities, housing has a dual nature as an asset also providing housing services. If house prices are assumed to reflect the present value of future expected rents (imputed rents for homeowners), then the positive wealth (and substitution) effect of higher housing prices on non-housing consumption is believed to dominate the negative income effect (in form of higher imputed rents) for owner-occupiers. For renters, and especially for those who plan to purchase a home later on, the total effect of rising housing prices are negative due to negative income and wealth effects (expected higher prices and downpayments). Therefore, the aggregate effects of housing price increases depend on the distribution of homeowners and renters (future homeowners) and may entail redistribution of resources depending on the time horizon. As a consequence, homeowners' individual capital gains, their capital gains relative to market returns, as well as renters' reactions to housing price changes are evaluated separately.

Furthermore, the standard life-cycle model predicts that older households should have higher MPCs to income and wealth shocks than younger households because of the differences in expected life times. In addition, as shown by Carroll and Kimball (1996), adding income uncertainty to the standard life-cycle model induces the consumption function to be concave, in which the marginal propensity to consume out of transitory income shocks, as well as wealth shocks, declines with the level of wealth. Therefore, consumption responses to housing wealth shocks are estimated for different age and wealth groups.

In the literature, not all papers have estimated equation 1 using household level data. Instead, much of the earlier literature used aggregate time series data to estimate the model. For



example, Peek (1983), and Skinner (1994, 1996) estimated that the MPC from housing wealth in the US was between 3 and 5 percent while Ludvigson and Steindel (1999) found the MPC from stockmarket of 3-4 percent. Case *et. al.* (2001) extended this methodology to a panel of countries, finding that the MPC from housing wealth was around 12-14 percent for the 14 developed countries that they analyzed for 1975-1996.<sup>5</sup> Similarly, Bertaut (2002) found significant wealth effects from equities in the US, the UK, Canada and Japan. Ludwig and Slok (2002) combined estimates of the MPC to both housing and equity price changes simultaneously, using data for 16 OECD countries. They found the MPC from stock price changes to be around 8 percent, about twice as large as the reaction to housing price changes.

A serious drawback from using aggregate data, see Poterba and Samwick (1995), is that changes in the house price index or in the stockmarket index are likely to be concurrent with other changes in the wider economy. For example, stock prices should, in theory, reflect the future profitability of firms. If profitability is driven by productivity gains, then at least part of these productivity gains will be manifested in higher wages (either now or in the future) that are also likely to increase households' current consumption. Similarly, house prices change with local economic conditions, which will also affect current and future wages. This makes regressions of aggregate consumption against aggregate house prices or aggregate changes in the stock market difficult to interpret as pure wealth effects.

Many papers have, instead, estimated a version of this equation on cohorts, constructed from observable characteristics such as year-of-birth of the household head or the level of assets that the household holds. Implicitly this type of difference-in-difference estimator allows for aggregate effects but identification imposes that these aggregate effects are the same across cohorts. For example, Mankiw and Zeldes (1991) argued that stockowners react more to aggregate stock market returns than non-stockowners and hence estimated a version of equation 1 using the Panel Study of Income Dynamics (PSID) by constructing cohorts based on asset holdings in 1984. They found that stockowners are much more sensitive to changes in the S&P500 index than non-stockowners. A similar approach to estimating the effect of was taken by Poterba and Samwick (1995), and by Paiella (2004) who found using pooled cross-sections of the SHIW that the MPC out of financial wealth is 9.2 percent in Italy. Attanasio *et al.* (2002) developed this approach to analyze UK Family Expenditure Survey and to account for the changing composition of stockholders over time. They contrasted the MPC of likely stockholders with likely non-stockholders after using the characteristics of households to predict those households which hold stocks.

Comparing cohorts is not unproblematic. For example, if different types of households have different portfolios, then again estimates of the MPC of wealth gains can again result in misleading inferences. For example, those households which Attanasio *et. al.* (2003) predicted to own stocks, such as high education households, have other characteristics that are likely to affect their consumption behaviour. In particular, if there have been education biased productivity shocks then the future wages of educated workers are likely to increase (and hence their current consumption) at the same time as firms' profits and stock prices. This indirect channel makes interpretation these their regression results more problematic. Similar arguments hold for housing wealth.

Of course, this paper is not the first to use the actual observations on households rather

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<sup>5</sup>Boone and Girouard (2002) also used a time-series panel and found lower estimates of around 3-5 percent, for France, the UK and the US, but over 10 percent for Canada and Japan.

than averaging across cohorts. However, these other papers often imputed the change in wealth from changes in housing or stockmarket wealth since they did not observe the actual change experienced by the household. For example, Disney *et al.* (2003) exploited changes in regional house price indices rather than in national prices. Nevertheless, there are papers that used the individual gains that households reported. Engelhardt (1996) used only homeowners with 2 time periods (one  $\Delta W$  and looked at the change in saving from PSID, excluded households who moved). A similar approach was taken by Dynan and Maki (2001) who investigated the change in consumption of stock holders who owned stock but did not change their portfolio between the 2nd and 5th interview of the CEX. A similar approach was used to study Japanese households by Hori and Shimizutani (2003) who also excluded households who did not own assets, but specifically accounted for changes in the asset portfolio that resulted from purchases and sales. Unfortunately, while their estimated effects were large, they were never significant, perhaps due to their small sample size. Our approach is similar to these studies except that we can control for the purchase and sale price of housing. Moreover, we include non-homeowners, which enables us to control for changes in consumption that are common across all households. Lastly, a homeowner dummy means we can control for the fact that the consumption of homeowners might be growing more quickly than non-homeowners.

To summarize, regressions of aggregate consumption against aggregate house prices or aggregate changes in the stock market difficult to interpret as pure wealth effects. Even partitioning the data between ‘likely’ stockholders and ‘unlikely’ stockholders, as in Attanasio *et al.* (2002) among others, will not solve this problem if the distribution of wealth shocks is correlated with shocks to permanent income. Carroll *et al.* (1994) argued that it is important to look at the behaviour of individual households, since at the individual level, there is likely to be enough heterogeneity in shocks to asset values and shocks to income to be approximately uncorrelated. Thus we believe that it is important to estimate the MPC of households using household level data, where there is likely to be considerable heterogeneity in the cross-section of changes in income and wealth that can usefully be exploited.

## 4 The data

Our study utilizes the Survey of Households Income and Wealth (SHIW), published by the Bank of Italy. It is a representative sample of Italian households where the households are sampled almost every second year years. Since 1987 there has been a panel component to the survey. We focus on the panel section of the SHIW, having data from seven years: 1989, 1991, 1993, 1995, 1998, 2000, and 2002.<sup>6</sup> Each year between 4,000 and 8,000 new households were sampled. While many households were only sampled once, a subsection of households of over 1000 households were re-sampled in the next survey, allowing us to construct a household panel.

The survey includes questions about individual characteristics and occupational status, sources of income (payroll and self-employment income, pensions, transfers, and property income), expenditure on durables and on non-durables, the properties lived in or owned, and financial assets and liabilities. It also includes a set of sampling weights to better align some socio-demographic marginal distributions with the corresponding distributions found in ISTAT’s population statistics and labour force survey. This dataset has a number of advantages over the US and UK data. Unlike the PSID, it contains information on a broader range of consumption

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<sup>6</sup>We omit data from 1987 since the sample design was somewhat different in that year.

items than just food expenditure. It also contains comprehensive income and wealth information, unlike the CEX, and hence it negates the need to construct cohort averages and match cohorts across different datasets. Finally, unlike the FES, it contains a panel component. Hence this dataset is almost unique in that it allows a household level study of the MPC from changes in income and wealth.

This study investigates both direct and indirect wealth effects. To investigate direct wealth effects, the change in non-durable consumption was regressed on the change in income and the capital gain in housing and in publicly traded shares. Ideally capital gains from would be calculated from changes in the value of assets net of any purchases and sales. For those households who did not move home, the capital gain on housing was calculated as the change in the self-reported value of housing less housing debts, after accounting for extraordinary maintenance costs. Many of the households that moved recorded the buying and selling price of their primary residence, allowing us to directly calculate the realized capital gain for these households net of home improvements. However, some households did not report the buying/selling price and hence are omitted from the sample.

In the case of equity wealth effects, we focused on households who had direct stockholdings, more specifically, on households who owned shares of publicly quoted companies. We disregard households who only had indirect stockholdings through mutual funds, as the capital gains and composition of asset classes in these funds can not be identified. To identify capital gains from changes in portfolio allocations, we concentrate on households who owned publicly quoted shares for two consecutive time periods, but who did not buy or sell their shares within two consecutive time periods. This is necessary, as the information about the purchase and selling values (net purchases) of equities is not available in the data. However, focusing only on households who had experienced unrealized capital gains or losses significantly decreases our sample of stockholders.<sup>7</sup>

Finally, the dataset used in our estimations is constructed in the following way. Firstly households with fewer than two observations during the period 1989-2002 are deleted. Secondly, in order to focus on working age households and not to be concerned with composition effects and mortality risk, only families where the head of household is between 25 and 65 years old are included in the sample. Thirdly, families with zero or negative real total consumption, and real non-durable consumption, are deleted. Fourthly, we exclude self-employed households since it can often be difficult to distinguish between consumption and business expenses for these households, and also to distinguish between personal and business wealth. Nevertheless, the results would not be very different if these households had been included in the regressions. Fifthly, households whose financial or real wealth had changed due to changes in the household structure are not included in the sample. Finally, standard consistency checks were made and missing observations were deleted. Nevertheless, we are left with over 6,769 observations.

## 5 Empirical results

For each of the regressions, the observations were weighted using population weights, and White robust errors were calculated. Moreover, all income, consumption and wealth variables were expressed in real terms (in 1989 money) and in natural logarithms.

<sup>7</sup>While some households may have rearranged their portfolio of equities while keeping the overall number of equities held unchanged, the number of such households is likely to be very small.

## 5.1 Housing Wealth

The results for housing wealth are reported in table 1. The first column displays the basic regression results in which the change in non-durable consumption is regressed against the change in income, the real interest rate and a set of household characteristics. These results show that the marginal propensity to consume out of income is around 20 percent, and is statistically significant at the one percent level. This value may seem high but we do not distinguish whether this change in income was expected or unexpected, nor do we distinguish whether the change is temporary or permanent. Since the focus is on the effect of changes in wealth, we do not investigate these different components of the change in income separately. The effect of the real interest rate is also investigated, but is not statistically significant in these regressions. Of the household characteristics, only the change in household composition is statistically significant. The regression clearly shows that increasing the size of the household results in an increase in the level of consumption of the household, as would be expected by theory. Moreover, these effects change little for the different regressions as reported in columns 2-5 and will not be commented on further.

The second column of table 1 separates the effect on consumption of changes in income of homeowners and of renters. As might be expected, renters are more sensitive to changes in income than homeowners. Their marginal propensity to consume out of income is 22 percent, compared to the 15 percent figure for homeowners. However, the difference is not statistically significant at the 5 percent level.

The third column investigates the effect of changes in house prices (measured by the Bank of Italy aggregate house price index) on renters and on homeowners. Comparing this regression to the results in column 2 shows that the effect on the marginal propensity to consume out of income for renters and for homeowners is almost unchanged. The effect of the house price index on renters is approximately zero. This suggests that the consumption of renters does not respond to changes in house prices. For homeowners, the marginal propensity to consume out of changes in aggregate house prices is around 5 percent. Although the figure is not statistically significant, the size of the coefficient is similar to other estimates for the marginal propensity to consume from housing wealth. Moreover, it is not obvious that households would be able and willing to spend more on consumption for while Italian credit markets would in principle allow housing equity withdrawal, this is not very common in practice. In which case households might find it difficult to raise their current spending.

One problem with this estimate, as was explained earlier, is that changes in house prices are likely to be correlated to changes in the wider economy. In particular, increases in house prices will occur at the same time as the permanent income of households in the economy will increase. If these changes in income affect renters and homeowners equally, then the true effect of changes in house prices will be equal to the difference between the effect on renters and on homeowners. That is, the effect of the house-price index can be separated from wider changes in the economy using a difference of difference estimator. The regression in column 3 of table 1 would thus imply that the true housing effect is around 6 percent (although, unfortunately, this number is not statistically significant).<sup>8</sup>

The difference-in-difference estimator suggested by column 3 imposes that changes in the

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<sup>8</sup>Note that if renters hope to become homeowners at some future date, then rising house prices would entail that these households must reduce their consumption in order to save a deposit for any house price purchase. This could also explain the difference between renters and homeowners in their response to the house price index.

wider economy must have the same effect on renters and on homeowners. This assumption, although rather common in the literature, is rather unsatisfactory. Especially so for studies of the UK and the US where there is much evidence that the wage premium to education has increased over the last 20 years, and where more educated households are more likely to be homeowners. This correlation will bias the estimated effect of changes in house prices using the difference-in-difference estimator. Hence column 4 of table 1 uses the self-reported change in housing wealth. This time the MPC from housing wealth is estimated to be over 8 percent, and is statistically significant at the 1 percent level. Moreover, the difference between the MPC from income of renters and of homeowners is now significant at the 5 percent level. We believe the estimates in this column are more reliable than those in column 3. In the last column of table 1 we include both the aggregate house price index, and the change in housing wealth reported by the household. The MPC to the household's actual change in housing wealth is almost unchanged. However, the MPC to the house price index for homeowners is smaller. The difference between the effect of the index on homeowners and on renters is now around 3 percent in this regression, although this difference is not statistically significant.

In columns 4 and 5 of table 1, the MPC from income differed significantly for renters and for homeowners. One interpretation of the result that homeowners seem to react less to changes in income than renters is that they are simply less sensitive to changes in income. That is, they receive the same income shocks but react less. For instance, if credit constraints are more often binding for homeowners rather than renters, then this group would react more to the same change in income. However, it is possible that the predictable component of the change in income is lower for renters. Moreover, even if the change in income was not predicted, it will be made up of permanent and temporary components, and households ought to change their consumption more in response to a permanent shock than a temporary shock. However, we do not know how renters and homeowners differ in their income shocks, or the predictability of their changes in income.

## 5.2 Equities

Table 2 repeats the exercise of table 1 but this time investigating the effect of equities. The first column compares the MPC from income of stockholders and non-stockholders, finding that non-stockholders are estimated to have much higher responses to changes in income than stockholders. Their estimated response is almost twice as high. However, the differences are not significant, mainly because the standard errors in the estimate for stockholders is rather high.

The second column compares the response of consumption to changes in the stockmarket index.<sup>9</sup> It shows that both stockholders and non-stockholders respond significantly to the effect of changes in the value of stocks. However, this is likely to be because households' incomes are growing during periods when the the stockmarket is increasing. The difference between the response of stockholders and non-stockholders is the difference-in-difference estimator of the effect of stocks, assuming that the aggregate economy has the same effect on both groups. This would imply the pure effect of equities is around 1.5 percent (which, however, is not statistically significant). The size of this effect is considerably smaller than the estimated housing effect.

Column 3 of table 2 uses the reported returns of each stockholding household. In this regression the effect of changes in stockmarket wealth are just under 0.5 percent, and are highly statistically significant. This compares with an estimated effect of around 8 percent for housing

<sup>9</sup>The household characteristics are omitted from the tables, but are available on request.

wealth. The results in the fourth column, which includes both the stockmarket index and the individual return, give a very similar number. These results suggest that households are considerably more sensitive to changes in housing wealth than stockmarket wealth. It also suggests the importance of investigating the households actual return on equities rather than substituting the average return of the stockmarket index (which over-estimated the return to equities).

### 5.3 Young and Old Households

Having investigated the effect of housing assets and equities on consumption, it is useful to disaggregate the effects by household type. To do this we concentrate on housing since we found the effects of stocks was small (although nevertheless statistically significant), and because relatively few households own stocks. As mentioned earlier, the standard life-cycle model of consumption implies that households in different age groups should react differently to similar income and wealth shocks due to differences in life expectancy. Notwithstanding that there may be differences in the predictability and the permanence of changes in income, older households are likely to have a shorter planning horizon, and hence we expect these households to react more to one-off shocks in income and wealth. However, older households may be less often credit constrained compared to younger households, which would imply a weaker reaction to predictable or temporary changes in income or wealth. How such households compare is thus ambiguous.

The differences between younger and older households is thus investigated in table 3. In these regressions, a household is ‘young’ if the household head is under the age of 45 and is ‘old’ if the head is over 45 but less than 65. The first column compares the marginal propensity to consume from changes in income for young and old households. The results are suggestive: for both renters and homeowners, the MPC is higher for younger households than for older households, as finding which is consistent with the view of young households are more often credit constrained than older households. Moreover, renters have a higher MPC than homeowners both when they are young and when they are old. However, although the differences are large, and would have some economic significance, the differences are not statistically significant at conventional significance levels.

The second column of table 3 investigates how young and old households react to changes in self-reported housing wealth. For young household, the MPC from housing wealth is around 4.5 percent, while for old households the corresponding figure is around 15 percent. This difference is significant at the 10 percent level, suggesting that older households are more sensitive to self-reported changes in housing wealth than younger households. This may reflect the fact that older households could have a shorter planning horizon.

The additional effect of changes in the house aggregate house price index is reported in the third column. The table shows that renters do not react to changes in the index when either young or old. However, this pattern is not true for homeowners. When young, the estimated effect of the house price index is slightly negative, although not statistically significant. Indeed when young, renters and homeowners react very similarly to changes in the house price index. Older homeowners, in contrast, have a high and positive reaction to changes in the house price index (and the difference between homeowners when young and old is significant at the 5 percent level). One possible explanation why younger households do not react to the index is that they are likely to have to little housing wealth compared to how much they would like to have

when older. For these households, if house prices rise, then they must save more to be able to afford the level of housing they later require. An alternative explanation is that the youngest households are more likely to be credit constrained and hence can not easily spend to extra wealth since this would require borrowing against the extra housing wealth. Older homeowners, in contrast, can benefit from changes in the price of housing if they anticipate that they will eventually sell their current house and buy something smaller, or if they can more easily increase their spending without borrowing.

#### 5.4 Different Wealth Groups

Table 1 investigated homeowners and renters, while table 2 divided households by whether they held equities. However, if there is a precautionary motive to saving we might expect households in different wealth groups to respond differently to income and wealth shocks. This division of households allows us to investigate the consumption responses of below-median wealth homeowners, median-wealth homeowners, and the richest homeowners. Income and wealth shocks being equal, households belonging to the wealthiest group are expected to respond the least to unpredictable changes in income and wealth gains. In table 4, households are divided into three equally sized groups according to whether they have low wealth, average wealth, or high wealth. The first column compares the MPC of these different wealth groups. For all three wealth groups the MPC from changes in income is significant, and it is highest for the low wealth group and lowest for the high wealth group. Moreover, these differences are statistically significant at the 5 percent level. This evidence is consistent with buffer stock notions of consumption.

The second column of table 4 looks at the effect of changes in the house price index. Here the results are striking. The low wealth group is highly sensitive to changes in the house price index, with a MPC of around 8 percent. The high wealth group is also sensitive, but this group reduces its consumption as the house price index increases (although, admittedly, the effect is only significant at the 10 percent level). The middle wealth group, in contrast, does not react to the house price index. These differences are significant at the 1 percent level. This evidence is consistent with a precautionary saving motive if we believe that the changes in the house price index are correlated with changes in overall economic conditions (and in particular changes in each household's permanent income). In which case we might expect the MPC for low wealth households to be much higher than for relatively wealthier households. However, we should be cautious since we do not know if all households gain equally from changes in aggregate economic conditions.

Column 3 assesses how households react to changes in their housing wealth. The results show that for each of the wealth groups the MPC from changes in housing wealth are between 7 and 10 percent. Although the figure is only statistically significant at the 5 percent level for the highest wealth group, the differences across the different wealth groups is not statistically significant (and we can reject that the effect is jointly zero for all the groups). That is, each of the wealth groups react in the same way to changes in their housing wealth. The last column of table 4 includes both the actual change in housing wealth for the household, and changes in the housing index. The results confirm the results in the second and third columns. There seem to be large differences across wealth groups in how households respond to the house price index but all types of household respond in a similar way to changes in their actual housing wealth.

## 6 Conclusion

This study analyzed the housing and equity wealth effects on households' non-durable consumption using Italian household panel data (SHIW) from 1989-2002. With this unique dataset containing detailed information on income, consumption and wealth, it is possible to estimate directly the wealth effects on households' consumption without using matching techniques to construct the data or to make compromises on the consumption or wealth measures, as has been the case in many earlier studies. Our main contribution arises from using this single dataset to analyze household consumption responses to housing and equity wealth shocks. Furthermore, we analyzed the consumption responses of different age and wealth groups of households. In addition, we investigated indirect wealth effects, i.e. how different types of households react to aggregate equity and housing price changes.

Regarding *direct* wealth effects (those arising from the self-reported change in wealth), our results indicate that homeowners' consumption react statistically and economically significantly to *realized* housing wealth shocks (the estimated MPC is over 8 percent). This is slightly larger than many US studies, where Peek (1983), Skinner (1984, 1986) and Engelhardt (1996) all found effects between 3 and 5 percent, but is in the range of estimates found by Disney *et. al.* for the UK and by Hori and Shimizutani (2003) for Japan. Our results also indicate that the estimated *unrealized* equity wealth effects for stockowners, although statistically significant, are economically quite small, with an average MPC of 0.4 percent. The estimated effect is lower than estimates for other countries such as the US where Dynan and Maki (2001) estimated a MPC of 5-14 percent.

We additionally find that the estimated elasticity for 'old' (45-65 years old) households is larger (the estimated MPC is around 15 percent), whereas for 'younger' (25-44 years old) households, the estimated elasticity is smaller (around 5 percent), but not statistically significant. Unexpectedly, the estimated elasticity for the richest wealth group households is the largest (around 10 percent), but not statistically significantly different from the medium wealth group households' elasticity (around 7 percent). For the lowest wealth group household, the estimated elasticity is statistically not significant. One possible explanation is that binding credit-constraints are preventing households in the lowest wealth group households from increasing their consumption in response to housing wealth gains.

We also investigated the effect of the house-price and stockmarket indices. For these *indirect* wealth effects, we find no support for indirect housing wealth effects, whereas indirect equity wealth effects are found to be statistically significant and economically large. The indirect equity wealth effects are likely to be related to expected improvements in income outlook, given that both stockholders and non-stockholders increase their consumption in response to positive stockmarket developments, and that the estimated coefficients between these two groups are found to be similar.

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Table 1: The Marginal Propensity to Consume from Housing Wealth

	(1)	(2)	(3)	(4)	(5)
$\Delta \ln y_{it}$	0.2001*** (0.0208)				
Renter $\times \Delta \ln y_{it}$		0.2262*** (0.0270)	0.2264*** (0.0270)	0.2530*** (0.0277)	0.2533*** (0.0277)
Homeowner $\times \Delta \ln y_{it}$		0.1569*** (0.0329)	0.1538*** (0.0332)	0.1615*** (0.0357)	0.1605*** (0.0359)
Renter $\times \Delta \ln$ Housing Index			-0.0056 (0.0218)		-0.0088 (0.0231)
Homeowner $\times \Delta \ln$ Housing Index			0.0543 (0.0357)		0.0240 (0.0381)
Change in Housing Wealth				0.0842*** (0.0292)	0.0833*** (0.0293)
Real interest rate	-0.0005 (0.0009)	-0.0005 (0.0009)	-0.0005 (0.0009)	-0.0001 (0.0009)	-0.0001 (0.0009)
Age/10	-0.0060 (0.4147)	-0.0069 (0.4147)	-0.0453 (0.4144)	-0.3690 (0.4286)	-0.3827 (0.4284)
Age-squared/100	-0.0089 (0.0939)	-0.0088 (0.0940)	0.0002 (0.0939)	0.0722 (0.0975)	0.0752 (0.0975)
Age-cubed/1000	0.0012 (0.0069)	0.0012 (0.0069)	0.0005 (0.0069)	-0.0047 (0.0072)	-0.0049 (0.0072)
Retired	0.0093 (0.0154)	0.0089 (0.0154)	0.0083 (0.0155)	0.0046 (0.0161)	0.0042 (0.0161)
Homeowner	0.0079 (0.0110)	0.0085 (0.0109)	0.0014 (0.0127)	0.0033 (0.0114)	-0.0014 (0.0131)
High school	0.0076 (0.0108)	0.0082 (0.0108)	0.0081 (0.0109)	0.0114 (0.0114)	0.0113 (0.0114)
University degree	0.0288 (0.0178)	0.0280 (0.0177)	0.0280 (0.0177)	0.0381** (0.0186)	0.0380** (0.0186)
North	-0.0102 (0.0125)	-0.0100 (0.0124)	-0.0097 (0.0124)	-0.0100 (0.0131)	-0.0098 (0.0131)
South and islands	-0.0231* (0.0136)	-0.0231* (0.0136)	-0.0238* (0.0136)	-0.0200 (0.0143)	-0.0204 (0.0144)
Female	-0.0087 (0.0182)	-0.0089 (0.0182)	-0.0086 (0.0182)	-0.0140 (0.0189)	-0.0140 (0.0189)
Married	0.0210 (0.0170)	0.0211 (0.0170)	0.0216 (0.0169)	0.0194 (0.0178)	0.0197 (0.0178)
Change in Family Size	0.2355*** (0.0323)	0.2350*** (0.0323)	0.2352*** (0.0324)	0.2223*** (0.0348)	0.2224*** (0.0348)

Notes: Robust standard errors in parenthesis. \* is statistically significant at 10 percent level, \*\* at 5 percent level, \*\*\* at 1 percent level. Changes in housing wealth and change in housing index are the percentage changes, while  $\ln y_{it}$  is the change in household log-income. All regressions include a constant and a set of cohort dummies. Sample is 6,769 obs.

Table 2: The Marginal Propensity to Consume from Stockmarket Wealth

	(1)	(2)	(3)	(4)
Stockholder $\times \Delta \ln y_{it}$	0.1155 (0.1872)	0.1214 (0.1873)	0.0885 (0.1858)	0.0944 (0.1859)
Non-stockholder $\times \Delta \ln y_{it}$	0.2013*** (0.0210)	0.2033*** (0.0210)	0.1991*** (0.0210)	0.2010*** (0.0210)
Stockholder $\times \Delta \ln$ Stock Index		0.0842** (0.0406)		0.0861** (0.0408)
Non-Stockholder $\times \Delta \ln$ Stock Index		0.0697** (0.0273)		0.0689** (0.0273)
Change in Stockmarket Wealth			0.0045** (0.0019)	0.0046** (0.0019)
Real Interest Rate	-0.0005 (0.0009)	-0.0013 (0.0009)	-0.0007 (0.0009)	-0.0015 (0.0009)

Notes: Robust standard errors in parenthesis. \* is statistically significant at 10 percent level, \*\* at 5 percent level, \*\*\* at 1 percent level. Changes in housing wealth and change in housing index are the percentage changes, while  $\ln y_{it}$  is the change in household log-income. All regressions include a constant and a set of cohort dummies. Sample is 6,769 obs.

Table 3: The Marginal Propensity to Consume from Housing Wealth by Age

	(1)	(2)	(3)
$\Delta \ln y_{it} \times \text{homeowner} \times \text{'young'}$	0.2099*** (0.0531)	0.2266*** (0.0573)	0.2288*** (0.0573)
$\Delta \ln y_{it} \times \text{homeowner} \times \text{'old'}$	0.1428*** (0.0408)	0.1363*** (0.0443)	0.1307*** (0.0442)
$\Delta \ln y_{it} \times \text{renter} \times \text{'young'}$	0.2590*** (0.0417)	0.2864*** (0.0439)	0.2865*** (0.0439)
$\Delta \ln y_{it} \times \text{renter} \times \text{'old'}$	0.2064*** (0.0350)	0.2215*** (0.0351)	0.2216*** (0.0351)
Change in housing wealth $\times$ 'young'		0.0458 (0.0456)	0.0498 (0.0462)
Change in housing wealth $\times$ 'old'		0.1505*** (0.0373)	0.1473*** (0.0373)
$\Delta \ln \text{housing index} \times \text{homeowner} \times \text{'young'}$			-0.0252 (0.0488)
$\Delta \ln \text{housing index} \times \text{homeowner} \times \text{'old'}$			0.1278** (0.0552)
$\Delta \ln \text{housing index} \times \text{renter} \times \text{'young'}$			-0.0136 (0.0321)
$\Delta \ln \text{housing index} \times \text{renter} \times \text{'old'}$			0.0138 (0.0282)
Real Interest Rate	-0.0003 (0.0009)	-0.0001 (0.0009)	0.0000 (0.0009)

Notes: Robust standard errors in parenthesis. \* means statistically significant at 10 percent level, \*\* at 5 percent level, \*\*\* at 1 percent level. 'Young' refers to head of household under 45, while 'old' refers to over 45. Changes in housing wealth and change in housing index are the percentage changes, while  $\ln y_{it}$  is the change in household log-income. All regressions include a constant and a set of cohort dummies. Sample is 6,769 obs.

Table 4: The Marginal Propensity to Consume from Housing Wealth by Wealth Groups

	(1)	(2)	(3)	(4)
$\Delta \ln y_{it} \times$ low wealth	0.2552*** (0.0397)	0.2554*** (0.0396)	0.2648*** (0.0390)	0.2664*** (0.0389)
$\Delta \ln y_{it} \times$ medium wealth	0.2171*** (0.0351)	0.2169*** (0.0352)	0.2348*** (0.0390)	0.2366*** (0.0390)
$\Delta \ln y_{it} \times$ high wealth	0.1293*** (0.0335)	0.1344*** (0.0334)	0.1559*** (0.0352)	0.1587*** (0.0352)
$\Delta \ln$ Housing Index $\times$ low wealth		0.0826*** (0.0257)		0.0646** (0.0271)
$\Delta \ln$ Housing Index $\times$ medium wealth		0.0024 (0.0253)		-0.0200 (0.0282)
$\Delta \ln$ Housing Index $\times$ high wealth		-0.0623* (0.0332)		-0.0500 (0.0354)
Change in Housing Wealth $\times$ low wealth			0.0927 (0.1163)	0.0772 (0.1156)
Change in Housing Wealth $\times$ medium wealth			0.0702* (0.0385)	0.0757* (0.0392)
Change in Housing Wealth $\times$ high wealth			0.0974** (0.0465)	0.0918** (0.0464)
Real Interest Rate	-0.0005 (0.0009)	-0.0006 (0.0009)	-0.0001 (0.0009)	-0.0002 (0.0009)

Notes: Robust standard errors in parenthesis. \* means statistically significant at 10 percent level, \*\* at 5 percent level, \*\*\* at 1 percent level. The three wealth groups divide the sample into approximately equally sized groups. Changes in housing wealth and change in housing index are the percentage changes, while  $\ln y_{it}$  is the change in household log-income. All regressions include a constant and a set of cohort dummies. Sample is 6,769 obs.

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