ISSN 2282-6483

Alma Mater Studiorum - Università di Bologna
DEPARTMENT OF ECONOMICS

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*Quaderni - Working Paper DSE N°1097*

This version: August 2015

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## *Abstract*

We estimate marginal propensities to consume from wealth shocks for Italian households in the early part of the Great Recession. Large asset price shocks in 2008 underpin an IV estimator. A euro fall in risky financial wealth resulted in cuts in annual total (non-durable) consumption of 8.5-9 (5.5-5.7) cents. There is evidence of effects on food spending. Responses of total and non-durable spending to changes in housing wealth are 0.2 to 0.3 cents/euro. Point estimates of the effect of the financial wealth shock are larger if the youngest and/or oldest households are excluded. Results indicate that responses to the wealth shock were stronger for those who became pessimistic about the stock market, and for those owners of risky assets who also held mortgage debt. Counterfactuals indicate financial wealth effects were important (relative to other factors) for consumption falls in Italy in 2007/08.

**Key words:** Wealth effects; household consumption; the Great Recession

**JEL codes:** D12, D91

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* This paper substantially improves on Bottazzi, Trucchi and Wakefield (2013) and earlier versions were circulated and presented under the title "The Effects of the Financial Crisis of the late 2000s on the Wealth, Consumption and Saving of Households in Italy".

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The authors gratefully acknowledge financial support from MIUR-PRIN 2010-11, project 2010T8XAXB_006 and from MIUR-FIRB 2008, project RBFR089QQC-003-J31J10000060001. We thank: Andrea Neri at the Bank of Italy for support regarding the SHIW data and patience in fielding our queries; Richard Blundell, Tom Crossley, Carl Emmerson, Luca Nunziata and Luigi Pistaferri for comments at various stages of our project; and, seminar participants (including several diligent discussants) at: the Warsaw International Economics Meetings, 2012 ; the CERP conference on Financial Literacy, Saving and Retirement in an Ageing Society, 2012; the Royal Economic Society Annual Conference, 2013; the conference of the Italian Society of Economists (Societa' Italiana degli Economisti), 2013; the 12th Workshop of Macro-Dynamics, 2013; the Netspar International Pensions Workshop, 2014; the Institute For Fiscal Studies, 2014; and at two meetings of our MIUR-FIRB 2008 project group (both in Padua), for constructive feedback. All errors are our own.

# Wealth Effects and the Consumption of Italian Households in the Great Recession

## *1. Introduction*

A striking feature of the early part of the "Great Recession" was a sudden crash in the value of financial assets. Major stock-market indices[1] in the US and the UK approximately halved in value between peaks in autumn/summer 2007 and lows in March 2009. The drop in value of Italy's FTSE-MIB was even more pronounced at more than 60% between May 2007 and March 2009. Furthermore, a large part of the changes in asset values occurred during the central months of 2008, and so households that held wealth in the stock market suffered a sudden, potentially large and mostly unanticipated shock to the value of their financial wealth. Alongside these falls in asset values there were substantial falls in households' consumption expenditures. Figure 1.1 shows that for Italy the path of aggregate consumption closely shadowed the path of the stock-market index, with a 3 per cent fall between late 2007 and mid 2009 that, if anything, slightly lagged the fall in stock prices.

Our aim is to use the shock to asset values observed in 2008 to measure the strength of the response of consumption spending to the change in the value of financial wealth, for a representative sample of Italian households. Given the time period we are observing we will also be able to comment on the importance of these "wealth effects", relative to other factors, in driving the fall in households' consumption during the early part of the Great Recession in Italy. Among these "other factors" we consider the role of changes in housing wealth. However, unlike the US and UK, house values in Italy did not suffer large falls near the beginning of the Great Recession (Agenzia del Territorio, 2012), and so our emphasis is on the effects of financial wealth.[2]

**[Figure 1.1 about here]**

The 2008 shock to asset values is not only useful for us in providing empirical variation and the chance to analyse the importance of this driver of consumption in the recession, it is also fundamental to our strategy for dealing with a key endogeneity problem. All else equal, a household that cuts (increases) its consumption by more, will mechanically accumulate more (less)

[1] The Dow Jones Industrial Average for the U.S., and the FTSE "All Share" for the UK.

[2] The absence of a fall in house values also underpins the limited effect of wealth on consumption in results from the Bank of Italy quarterly model for the 2006-08 period, reported in Rodano and Rondinelli (2014).

wealth. Unless this is properly accounted for in the empirical set up, this could lead to a downwards bias in, or even a negative estimate of, wealth effects. We use the idea that the 2008 shock to asset values can provide a source of variation in wealth that is exogenous to households' consumption behaviour. Applying a method proposed by Banks et al (2012), this insight is used to build an instrumental variables (IV) estimator. The precise nature of the estimator is discussed in section 3.

Our study is related to other papers that have aimed to estimate the importance of wealth effects in driving consumption behaviour during the Great Recession. In an influential study of the U.S., Mian, Rao and Sufi (2013) estimate a marginal propensity to consume out of housing wealth of 5 – 7 per cent for the period 2006-09. This finding is robust to instrumenting using geographical constraints on housing supply (which should not be correlated with other drivers of consumption), and the authors also emphasize evidence that responses to the wealth shock are stronger where households are poorer or more "levered" (indebted).[3] Given the lack of a fall in house values mentioned above, the wealth shock that we look at is to financial, rather than real, wealth. In another excellent analysis of the US, Christelis, Georgarakos and Jappelli (2015) have looked at how losses on financial wealth, losses on real wealth, and unemployment, affected consumption in 2008-09. Using data that ask households to report capital losses on different assets they find a marginal propensity to consume out of financial wealth of around 3.3 per cent (and smaller effects for losses on housing). In line with economic theory, they also find evidence that those who expected the stock-market shock to be permanent adjusted their consumption more strongly than those who expected the shock to be transitory. As mentioned above, the methodology of our study draws on the England based analysis of Banks et al (2012). Those authors have less comprehensive data on spending than we do and a sample of agents aged 50+. They find only modest effects on household spending of wealth shocks during the crisis, but are also able to focus on wealth effects on other outcomes (including expectational outcomes) that we do not observe. To our knowledge our paper is the first attempt to look at the drivers of change in consumption, including wealth effects, during the Great Recession in Italy. Our data come from the Bank of Italy's Survey on Household Income and Wealth (SHIW), which provides rich data on households' asset holdings (values and ownership), consumption outcomes, and demographic and economic

[3] Indeed this work is part of a broader programme of research in which Mian and Sufi argue for the importance of "levered losses" for driving the large consumption contraction early in the Great Recession; their arguments and findings are brought together in Mian and Sufi (2014).

characteristics. The data are designed to be representative of the Italian resident population and also have a panel component, and this combination of characteristics is unique for Italy and impressive even by international standards. Thus our analysis of the Italian experience is of broader interest for understanding the importance of wealth effects and the evolution of consumption in Europe in the Great Recession.[4]

Analyses of the relationship between wealth effects and consumption during the Great Recession fit in an established literature regarding measuring wealth effects on consumption. There has been much recent emphasis on how propensities to consume from real wealth differ from propensities to consume from financial wealth[5]; an impressive recent survey of time series and micro-econometric evidence on wealth effects is provided by Paiella (2009), itself building on the equally excellent Poterba (2000). The studies most related to the present paper are those that provide evidence for Italy. Paiella (2007) uses pooled cross-sections of data to estimate long-run marginal propensities to consume from different forms of wealth while Calcagno, Fornero and Rossi (2009) focus on the effects of real estate wealth. Guiso, Paiella and Visco (2005) is closer to our study in that, in line with our analysis based on shocks, they aim to estimate the effects of capital gains as well as long run relationships between wealth and consumption; they find that on average a 1 euro gain in housing wealth increases annual consumption by around 2 cents, while capital gains on financial assets may even lead to reductions in consumption. Our key contribution to this literature lies in our exploitation of the asset price shock at the start of the Great Recession as a *new source of plausibly exogenous* variation in asset values in order to estimate how consumption responds to changes in wealth.

[4] The studies cited in this paragraph themselves fit in to a broader literature on consumption during the Great Recession. Petev, Pistaferri and Saporta Eksten (2011) and De Nardi, French and Benson (2012) for the US, and Crossley, Low and O'Dea (2013) for the UK, provide descriptive analyses that point to unusual features such as the duration of the contraction in consumption, and the broad range of consumption categories that have been affected. For Italy, Rondinelli, Bassannetti and Scoccianti (2014) show that national accounts data and household level data match quite well during the recent period and that there have been some differences in changes in expenditure shares across age groups but with a general shift away from "leisure" expenditures. Rodano and Rondinelli (2014) compare different recent recessions. Results from the Bank of Italy's quarterly model do not indicate a strong role for wealth in aggregate consumption during the period 2006-08. However, the measure of wealth in the model combines real and financial wealth and does not show a contraction during the relevant period; when the authors describe micro data they do find the falls in the value of financial assets that are our focus.

[5] See Slacalek (2009) and Case, Quigley and Shiller (2005).

Precisely stated, our research goal is to estimate the marginal propensity to consume (mpc[6]) out of the shock to financial wealth that occurred at the start of the Great Recession. A preview of key results is as follows. A one euro fall in financial (or risky financial) wealth resulted in households cutting annual total consumption spending by between 8.5 and 9 cents, and slightly more than 5.5 cents of this cut was in spending on non-durable goods and services. We find effects of around 1.5 cents for food spending, and insignificant results (though with the expected positive coefficients) for expenditure on durables. We also find that a one euro change in housing wealth results in total and nondurable consumption spending moving in the same direction by around between 0.2 and 0.3 cents, but we do not find significant effects on food or durables expenditures. We also find evidence that our estimates of wealth effects would be larger if we exclude the oldest and youngest households from our data, and evidence that indicates stronger consumption responses to the wealth shock among households who also became pessimistic about how they expected the stock market to perform and among households with some mortgage debt. Finally, counterfactual simulations indicate that financial wealth effects were an important driver (relative to other factors) of consumption falls in the early part of the Great Recession in Italy, accounting for 17 to 22 per cent of cuts in spending in our sample. Thus our results indicate that wealth effects on consumption can be important for households' welfare and for aggregate consumption and economic performance.

The paper is organised as follows. Section 2 introduces the dataset that we use and provides some data descriptives that further motivate our analysis. Section 3 then explains our research method, describing both our IV estimator and a key variable that must be constructed in order to implement this estimator. Section 4 then presents our main results on wealth effects. We first present average wealth effects for broad measures of consumption, then results for finer spending categories. We then put the size of our results in context, including through counterfactual simulations, and subsequently look at heterogeneity in wealth effects between groups of the population. Finally, section 5 concludes.

[6] We use "mpc" indifferently for "marginal propensit**y** to consume" and "marginal propensit**ies** to consume". Context should reveal whether we have a singular or a plural.

## *2. Data*

In this section we describe the structure of the dataset that we use, and the consumption and wealth variables that are essential to our analysis. Description of these key variables also helps to motivate our analysis of wealth effects.

### *2.1 The SHIW Dataset*

The Survey on Household Income and Wealth (SHIW) is a representative sample of the Italian resident population. Sampling is in two stages, first municipalities and then households. From 1987 onward the survey is conducted every other year (with the exception of a two-year gap between 1995 and 1998) and covers about 24,000 individuals and 8,000 households in around 300 municipalities. A household is defined as a group of individuals related by blood, marriage or adoption and sharing the same dwelling. About 50% of households in a given year are interviewed at least once in subsequent years (panel component).

The survey records a rich set of household and person characteristics as well as information on incomes and savings, and on household expenditure and wealth. Wealth data is rich, containing both participation and value for a range of financial assets, housing wealth, and businesses. For the purpose of our analysis, we use data for the years 2004-2010. In this way we are able to observe changes in wealth and consumption during the "Great Recession" (2006 – 08 and 2008 – 10) and also to construct our instrumental variable using information on household portfolios from the 2004 and 2006 surveys.

In the next two subsections we describe the SHIW variables that are the most important for our analysis, those regarding consumption and asset holding.

### *2.2 SHIW consumption variables*

The SHIW dataset records consumption spending on four different categories of products. Total consumption is the sum of two other categories, namely durable (means of transport, furniture, household appliances, etc.) and non-durable expenditures. Food consumption is a subclass on non-durable spending and includes meals at home or eaten out. In our analyses we always measure expenditures annually and in real terms (2010 euros, based on the Household Index of Consumer Prices provided by Istat).

Descriptive statistics on consumption in our sample are shown in table 2.1. Total consumption decreases between 2004 and 2010, but, on average, the drop is statistically significant at 1% only

between 2006 and 2008. This drop is largely driven by non-durable expenditure that significantly decreases by more than 600 euros on average between 2006 and 2008, with almost 400 euros of this change coming from food consumption. Durable consumption displays a slightly different pattern. It significantly decreases only in 2010, when, on average, durable goods expenditure decreases by 300 euros.

**[Table 2.1 about here]**

### *2.3 SHIW financial wealth variables*

The SHIW dataset collects detailed information on household portfolios. Respondents are asked whether they hold each of many types of asset and, if so, about the amount of wealth they hold in each asset. Assets are grouped in broad categories: cash (bank accounts and saving certificates); Italian government bonds (with different durations); domestic bonds and investment funds; Italian shares; foreign bonds and shares; other minor categories. Within each of these broad categories individuals are asked about a detailed set of assets. SHIW also provides information on household wealth in several types of mutual funds, and these funds can be categorised according to whether or not (and the extent to which) they expose the holder to stock-market risk.

If survey respondents report that they hold an asset, they are then asked about how much wealth they held in that asset at the 31st of December in the year after which the survey wave is named (i.e. December 31st 2008 for the "2008 SHIW").[7] Respondents are first asked to indicate in to which of several bands of value their asset fell and then to report a point amount for this value. Failure to report a point amount results in the household being asked whether the value of their holding is nearer to the bottom, middle or top of the band. Since not all individuals give a point amount we use some imputed values for wealth. In imputation we use band and bottom/middle/top information to allocate values by asset.[8]

Since our main regressions are in first-differences (see section 3) we have to be careful about the fact that imputation could considerably increase noise to signal ratio, especially for cases where individuals report holdings in the relatively broad top bands of asset values. For this reason in our sample selection we exclude from the sample households who do not provide a point

[7] Having end of year wealth means we have data on households at close to the top of the stock market (at the end of 2006) and at close to the bottom of the crash (at the end of 2008).

[8] To have a homogeneous measure of asset values we do not use imputed values provided by the Bank of Italy, since they are not available for the 2004 wave. We need to rely on imputation by the Bank of Italy for (the sum of) three types of deposit in 2006, since information on the band they belong to is not available. Results of section 4 are not sensitive to substituting Bank of Italy imputation for our imputation as far as possible.

amount and ever report being in the top bands (imputed wealth in a single asset above 150 000 euros with no upper limit). Our sample selection also requires panel information for three consecutive waves (to have a difference and our instrument) and we select respondents older than 30 years. We end up with a sample of 6370 person-year observations from nearly 4000 families, out of the approximately 8000 interviewed per year. We also experimented with tighter selection criteria; results are not reported but are available on request.

We postpone discussion of description statistics on wealth variables (and particularly on changes in wealth) until the next section, as these variables can usefully be compared to a key constructed variable. With our data and sample selection criteria in hand we can consider a description of the relationship between consumption and holding of risky (stock market exposed) financial assets. Table B1 presents fixed effects regressions, based on the households used in our main analysis, that describe patterns in the level of total consumption and non-durable consumption and how this relates to various other factors in our data. Qualitative patterns are similar between total and non-durable consumption.[9] Within each category, the difference between the two regressions is that the second includes a dummy for the ownership of risky assets, and the interaction of this dummy with year. While the year dummies in the first regression suggest (in line with the descriptives of the previous subsection) significantly lower average consumption in 2008 and 2010, the coefficients on these year dummies are no longer significant in the second regression. Rather, the substantial and significant negative coefficients on the interactions between year and holding risky assets suggest that the yearly pattern was driven by lower average consumption among individuals that hold risky assets. Of course this analysis is descriptive and stops short of identifying any mpc from wealth shocks. To proceed with estimation of such parameters we must adopt an appropriate empirical technique.

## *3. Research Method*

We now describe the empirical and conceptual framework underlying our research design. In particular, we now describe the main IV estimator that we use and explain why the time period of our data, and the asset price shock that they encompass, are crucial for our method of dealing

[9] Patterns are as expected: households with more members and more earners spend more, unemployed and retired households spend less. Coefficients are not reported but are available on request.

with the key problem of endogeneity. We also describe the key (change in) wealth variables that we use, and the constructed variable that we subsequently use to instrument the wealth change.

### *3.1 Empirical and Conceptual Setup*

The conceptual basis for our research design, and a useful framework for interpreting our empirical results, is the lifecycle model of consumption and saving. The simplest version of this model, with certainty and full transferability of resources between periods, predicts that agents should consume a certain proportion of their lifetime wealth (financial, physical and human wealth) in each period. To estimate this proportionality, or propensity to consume out of wealth, one might estimate the relationship between household consumption and household wealth in levels. An alternative, used, for example, by Dynan and Maki (2001) and Banks et al. (2012), is to take differences and regress the change (first difference)[10] in household consumption on the change in household financial wealth:

$$\Delta c_{ht} = \alpha + \omega \, \Delta w_{ht} + \varepsilon_{ht} \qquad (1)$$

where: subscripts $h$ and $t$ denote household and time period respectively; $\Delta c_{ht}$ is the first difference of real consumption spending equal to $c_{ht} - c_{h(t-1)}$; $\Delta w_{ht}$ is the similarly defined first difference in real wealth; $\alpha$ is a model parameter and $\varepsilon$ is the regression error term; and, $\omega$ is the parameter of interest intended to capture the propensity to consume out of wealth.

Relative to estimating in levels, there are some empirical advantages of the specification in differences. First, if one can measure a change in wealth which plausibly captures the change in value of the whole household portfolio, then this can be related to the change in consumption to provide a measure of the relevant propensity to consume, even if the value of some elements of the portfolio are not accurately observed. This potentially reduces the informational burden of the estimator (for example with regard to elements like human wealth). Second, a large change in the level (value) of one form of wealth will provide helpful variation to estimate the relationship of interest, and it is precisely such a large change in the value of an asset (risky financial wealth) that we will exploit.

The aim in estimating $\omega$ is to identify the effect of a(n unexpected) change in the value of wealth, on consumption. That is to say, we are aiming to estimate the marginal propensity to consume (mpc) out of (or to reduce consumption due to) a wealth shock. Within the lifecycle

[10] In our data first differences are two-year changes.

setup, we might think that this mpc should be heterogeneous across different types of household: one example would be that older households might have a shorter expected horizon over which to smooth consumption, and so on average respond more strongly to a wealth shock (have a higher mpc) than would a younger household. We return to this and other sources of heterogeneity in section 4.4. However, even without the issue of heterogeneity, there is an issue of endogeneity that must be dealt with if we are to properly identify the effect of wealth shocks on consumption.

Suitable conditions for identification would include that the change in wealth is an exogenous (to the change in consumption) shock. However, if resources can be either saved or spent then the problem of endogeneity is that, all else equal, an individual who accumulates more wealth will enjoy a smaller change in consumption (which may be a bigger absolute drop). This negative correlation between $\Delta c$ and $\Delta w$ is a mechanical implication of the dynamic budget constraint and not the causal relationship (from wealth to consumption) that we wish to identify. Estimation that does not take this into account will tend to yield underestimates of $\omega$, or possibly even negative mpc (implying a cut in wealth results in higher consumption spending).

Just as we are not the first researchers to estimate the differenced specification, we are also not the first to deal with this endogeneity issue. Dynan and Maki (2001) deal with the issue by regressing the change in consumption on the "passive" part of the change in wealth, which is that part that comes from capital gains rather than from active consumption/saving decisions, and similarly Christelis, Georgarakos and Jappelli (2015) have data in which households are asked to report capital gains (or losses). The approach of Banks et al. (2012) shares the idea of relating the change in consumption to a change in wealth that is not generated by active saving behaviour or portfolio adjustments, but uses this as the basis of an instrumental variables estimator.[11]

Our data are similar in structure to those used by Banks et al. (2012), and we implement a version of the instrumental variables estimator proposed by these authors. The estimator is based on taking a fixed wealth portfolio for each household, and calculating how the value of this portfolio would have changed due to changes in asset values and in the absence of any active saving (or dissaving) by the household. More concretely, consider calculating the change in the value of this fixed portfolio (hereafter "the calculated change in wealth") for an individual whose change in consumption and wealth are observed for the period 2006 to 2008. A candidate fixed

[11] One of the authors of the Banks et al paper has also used the idea of using changes in wealth that come from asset price shocks to instrument changes in wealth, in an analysis of the impact of wealth shocks on retirement plans; see Crawford (2013).

portfolio is the amounts of assets held in 2006. The household might (for example) have a certain amount of cash deposits, domestically held shares, and domestically held bonds.[12] Real values for these holdings by the end of 2008 can be calculated by applying the relevant real interest rate to the cash deposits, and the real change in the relevant price index for stocks and bonds, to up- (or down-) rate the values of the initial holdings. This will give a final value of the portfolio, and the calculated change in wealth is this final value less the initial value of the portfolio.

The measure of calculated changes in wealth can be expected to be correlated with actual changes in wealth, but is unaffected by active saving decisions and thus free of the mechanical relationship between wealth and consumption changes that we described above. Thus the calculated change in wealth is the ideal "excluded variable" to construct an instrument for actual changes in wealth.

The instrumental variables (IV) estimator just described should consistently estimate the relationship we want to identify between wealth *shocks* and consumption. The key exogenous variation in wealth that is being exploited is that generated by asset price changes. One way to justify that such changes come as shocks would be to note that asset price movements are highly persistent (permanent), so that the best guess of future prices are current prices and deviations from this are surprises. Furthermore, in our case the biggest source of variation in asset prices comes from the 2008 stock-market crash and it seems reasonable to suppose that price falls in this period were largely unanticipated (especially by individuals who remained in the stock market).

Thus far we have described the instrumental variables strategy as if the instrument for changes in wealth between $t$ and $t-1$ is based on the portfolio held at time $t-1$. In fact, if there is measurement error in portfolio shares such an estimator would be subject to bias since the same measurement error affects observed wealth changes and the proposed instrument. The method we use to deal with this is to take an extra lag and base the instrument on portfolio shares observed at $t-2$.[13] Thus, when considering the 2006 – 2008 change in wealth, we use the household's 2004 portfolio, and, for 2008 – 2010, the 2006 portfolio.

Another threat to clean identification could be an omitted variables problem if other factors that affect consumption (on average) are also correlated with the asset price shock. In this regard

[12] The list of assets classes used in our empirical application, and the price indices and interest rates that we apply to them, are described in Appendix A.

[13] This strategy is standard in differenced panel data models and in studies of consumption and saving it is familiar from the literature on estimating log linear approximations to Euler equations (see the discussion of Attanasio and Weber, 1993, p.634, or Banks, Blundell and Tanner, 1998, especially footnote 8).

a powerful advantage of the first-differenced regression is that it conditions out any household fixed effect. To further mitigate this potential problem we exploit the richness of our dataset and extend specification (1) to include a vector ($\boldsymbol{X}$ - with household and time subscripts suppressed) of covariates. An additional advantage of including covariates is that it enables us to compare the influence of wealth effects to the impact of other factors in driving changes (falls) in consumption in our sample. With covariates, the main model that we estimate by two-stage least squares is:[14]

$$\Delta c_{ht} = \alpha + \omega \widehat{\Delta w_{ht}} + \boldsymbol{X}'\boldsymbol{\beta} + \varepsilon_{ht} \qquad (2)$$

where: $\widehat{\Delta w_{ht}}$ is the predicted change in the relevant measure of wealth based on the first-stage equation, with the calculated change in wealth (the change in the value of a fixed portfolio), $\Delta fp_{ht}$, as a regressor:

$$\Delta w_{ht} = \gamma + \varphi \Delta fp_{ht} + \boldsymbol{X}'\boldsymbol{\delta} + \mu_{ht} \qquad (3)$$

When estimating the model described by equations (2) and (3), the main source of variation exploited to identify the effect of the instrumented wealth variable is heterogeneity between households in the distribution of financial wealth to different assets. By estimating based on data for changes in wealth and consumption between 2006 and 2008 and between 2008 and 2010 (and thus exploiting portfolios observed in 2004 and 2006), we get additional variation from the different movements in asset prices in the two periods.

### *3.2 Reported and Calculated Changes in Wealth*

In order to implement the IV estimator just described, a necessary preliminary step is the data (and labour) intensive construction of the "calculated change in wealth" variables. The principle involved is that already described of taking a household's portfolio as at 2004 or 2006, rolling forward the (real) values of the different assets held in this portfolio using appropriate interest rates and price indices, then aggregating values within a household's portfolio and taking the first difference. As made clear above, we use 2004 portfolios in instrumenting 2006 – 08 changes in wealth, and 2006 portfolios for 2008 – 10 changes. Thus the calculated changes in wealth that we exploit are the difference in two forecasted wealth values.

The variation in calculated changes in wealth in our data will depend on variation in initial portfolios and variation in the factors by which different assets get up- or down- rated. We applied

[14] Note that the notation for some coefficients and the error term is, for convenience, the same as in equation (1), but this should not be taken to mean that estimating (1) or the model of equations (2) and (3) will yield identical results.

different up- (or down-) rating factors to: cash deposits; (two types of) short term Italian government bonds; (several types of) long-term Italian government bonds; shares in Italian traded companies; shares held overseas; Italian private bonds; and a set of other foreign assets. In addition to this, information on holdings in mutual funds and the extent to which these funds are exposed to stock-market risk allows us to up rate forecast values for holdings in funds using information on stock returns for part of the fund, and on returns to safer assets for the other part of the fund. The full set sources for interest rates and asset price indices that we used in constructing calculated asset values is listed in Appendix A.

Having constructed calculated changes in the values of individual assets, we aggregate these up to get calculated changes in the value of a household's portfolio. We use calculated changes in wealth for two different portfolios: the overall portfolio of financial wealth; and, the portfolio of wealth exposed to financial market risk.[15]

While the process of constructing changes in "calculated" wealth is data and labour intensive, it is a necessary step for our IV strategy and comes with the additional advantage that comparisons between changes in reported wealth and in "calculated" wealth give us an initial indication of how households responded to the asset price crash in their wealth and portfolio decisions.

Table 3.1 describes the distribution of changes in reported and "calculated" wealth. On average, financial wealth decreases by almost 1300 euros in 2008 (i.e. between 2006 and 2008) and recovers by around half this amount in 2010. This trend is largely driven by a large fall in the value of risky financial wealth for owners of risky assets. Households that own these risky assets report an average decline in the value of their risky financial wealth between 2006 and 2008 of almost 25000 euro. Since around 14%[16] of households in the sample have risky assets this decline would average to a fall of 3600 euros across all households.[17] There is also a decline in the value of risky wealth between 2008 and 2010, but the fall is much less precipitous.

**[Table 3.1 about here]**

Changes in reported and "calculated" wealth are sensibly different. Reported changes in financial wealth are, on average, less negative than their calculated counterpart, possibly because

[15] This is mainly stock market risk and exposure can be either through direct holdings or through mutual funds.
[16] 441 out of 3047: see notes to Table 3.1.
[17] 24957*(441/3047) = 3612.

capital losses are partially offset by active saving. On the other hand, the reported change in risky assets is more negative than the "calculated change". This may indicate the reshuffling by households of their portfolios, to reduce exposure to stock-market risk. The idea is also supported by observed exits from the stock market during the crisis: the stock-market participation rate decreases from 14% before 2006 to 12% in 2008 and to 10% in 2010.[18] A regression of reported changes in wealth on calculated changes and a constant gives significant coefficients of 0.65 for overall wealth and 0.88 for risky wealth. Thus calculated changes in wealth do have the desired positive correlation with actual changes, and the relationship is closer for risky than for overall wealth.

## *4. Measuring wealth effects*

We now present our estimates of how consumption responded to the shock to financial wealth.

Our main estimator is the IV estimator described in section 3. As explained in that section, we believe this method will provide consistent estimates of the relationship of interest. By contrast, and again for reasons explained in the previous section, OLS estimation would be likely to produce an under estimate of the true relationship. For the first set of results that we present, which are our baseline results, we present OLS estimates alongside the IV estimates and see that OLS does indeed generate coefficients that are smaller than the IV estimates.

In line with equations (2) and (3), all of our estimates for wealth effects come from regressions that include several other independent ($\boldsymbol{X}$) variables alongside the key financial wealth variables. One variable of particular interest is the change in the household's perceived valuation of their housing wealth. While we have gone to a great deal of effort to ensure exogeneity of the financial wealth variables, for this housing wealth variable we simply include the change in the reported value of housing. The idea here is that since survey respondents are asked what they perceive to be the value of their house, what they report should be the level of wealth that informs their consumption choices. Furthermore, since (unlike financial wealth) real estate wealth is not readily adjustable, there is less of a problem of a mechanical relationship between active

[18] These ownership rates are calculated by the authors using the SHIW data (with sample as used in Table B1). Note that the ownership rates cannot be inferred from the numbers in Table 3.1 because the sample "with risky assets" in that Table are those that had risky assets at a fixed point in time (2006 when the ownership rate was approximately 14%).

saving in housing and changes in consumption. On the basis of these arguments we interpret the coefficient on changes in house value to be the mpc out of shocks to housing wealth.

The remaining regressors in all the reported regressions include *changes* in: unemployment status; retirement status; and, in the number of people and earners living in the household. The variables so far discussed are all in first differences. The reported results also always allow for the possibility that the change in consumption is related to the characteristics of homeownership, retirement status and employment in the private or public sector (all measured at time *t-1*), and not just to differences in such variables, and we always control for age bands, sex, education levels (compulsory, post-compulsory, and some college education), and, to capture effects coming from the state of the macroeconomy, region dummies, year and the regional unemployment rate.

Finally, we have obtained all our results with and without a control for the change (first difference) in labour income, and in several cases report both regressions. There is a worry that labour income may be endogenous (due, for example, to reverse causality from the desire to increase or reduce consumption to labour effort and therefore income) so it is reassuring that the inclusion of the change in labour income does not noticeably affect the other estimated coefficients in the model, and particularly the estimated wealth effects. Descriptive statistics for the financial wealth variables that are crucial for our empirical and IV strategy were presented in section 3 (Table 3.1); descriptive statistics for all other regressors are contained in Appendix Table B2.

### *4.1 Average responses to the wealth shock*

A key aim of our study is to understand how the wealth shock affected overall consumption spending for the households in our sample. In line with this, our first set of results, in Tables 4.1 and 4.2, respectively have the change in total household consumption spending, and change in household consumption spending on non-durables, as dependent variables. Each of these tables presents results for a subset of coefficients from 8 regressions. The first two columns present OLS regressions of the change in consumption on the change in wealth (and other regressors), first with and then without a control for the change in labour income, while columns 3 and 4 present the "second stage" results of the preferred IV specifications with, then without, the labour income control. The difference between the top and bottom panels is the financial wealth variable that is the main variable of interest: in the top panel this variable is the change in risky financial wealth

that is invested in the stock market either directly or through a wrapper product such as a mutual fund, while in the bottom panel it is the change in total (accessible[19]) household financial wealth.

**[Table 4.1 about here]**

**[Table 4.2 about here]**

For interpretation of the main wealth coefficients, it is easiest to consider an example. The coefficient on the calculated change in risky financial wealth in IV regression reported in column 3 of the top panel of Table 4.1 (this is the regression for the change in total consumption and that includes the change in income as a regressor) is 0.088. Since calculated changes in wealth are measured in real (2010) euros, and consumption is measured in euros per year, this point estimate indicates that if wealth increases (falls) by one euro, annual consumption increases (falls) by 8.8 cents. In other words, the coefficient indicates an mpc out of the wealth shock of 8.8 percent. Other coefficients on wealth variables can be interpreted analogously.

With this interpretation in mind, we can summarise our main IV results for the effects of the shock to financial wealth on consumption, as follows. We report results from regressions with the control for the change in labour income, and in brackets the results without this control. For total consumption (Table 4.1), the mpc is 8.8 (8.6) percent of the shock to risky financial wealth, and 10 (9.9) percent out of total financial wealth. For non-durable consumption (Table 4.2) the estimates are 5.7 (5.5) percent out of the shock to risky financial wealth, and 6.2 (6.1) out of total financial wealth. It is a general pattern in our results that controlling for the change in labour income has almost no impact on the estimates of our main coefficients of interest. As a point of comparison, the estimated mpc for changes in financial wealth are considerably larger than the results that we get for the propensity to consume out of a change in housing wealth, which is robustly estimated to be between 0.3 percent and 0.1 percent.

Comparing these IV results to OLS estimates (columns 1 and 2 in Tables 4.1 and 4.2), we see that the OLS results are always substantially smaller than the IV estimates. This is in line with the arguments of the previous section that there are good reasons (the mechanical relationship between changes in consumption and in wealth through the budget constraint, and attenuation bias due to measurement error) to expect OLS estimation to underestimate this coefficient.[20]

[19] Accessible wealth excludes wealth "locked away" in pensions or life-insurance or similar products.

[20] We do not report the "reduced form" that relates the change in consumption to the excluded instrument (and the other regressors). Given that we have one endogenous variable and exact identification, the coefficient on the wealth variable in this reduced form can be inferred as the product of the coefficients on the respective wealth variables in

Focussing (from here forward) on our preferred IV estimates, we notice that the point estimates for the mpc are very slightly smaller but more precisely estimated when the key independent variable is the change in risky financial wealth (top panel of Tables 4.1 or 4.2), compared to when it is the change in total financial wealth. For example, if we take the cases for total consumption and with the control for the change in labour income (column 3 of the Table 4.1), the estimated coefficient is: 0.088 (significant at the 10% level) when the regressor relates to risky wealth; and, 0.1 (not significant at conventional levels) when the regressor is the change in total financial wealth. The equivalent coefficients for non-durable consumption respectively are 0.057 (significant at the 5% level), and 0.062 (significant at the 10% level). The greater precision when the regressor is the change in risky wealth is partly due to the fact that we have greater precision (a smaller standard error on the instrument) in the first stage for the case using risky wealth, which indicates that instrumenting adds less noise in this case. The greater precision, and larger size, of the estimated coefficient on the excluded variable in the case with risky wealth again indicate (as noted in subsection 3.2) that there is a stronger relationship between asset prices and the value of risky wealth than between asset prices and the value of all financial wealth, perhaps because portfolio reshuffling and the accumulation of safe assets weaken the relationship to total wealth. The F-statistic on the excluded instrument also indicates that our IV strategy is more effective when the regressor is the change in risky wealth: in that case we do not need to worry about a weak instrument problem. Full first-stage results are reported in Appendix Tables B3 (risky financial wealth) and B4 (total financial wealth).

As already noted, the wealth effect coefficients are robust to controlling for the change in labour income. Our results are also robust to a series of other modifications to our specifications. For example, while our data are for changes in wealth and consumption between 2006 and 2008, and 2008 and 2010, most of the variation that our estimator exploits is related to the asset price shock that occurred between the 2006 and 2008 waves of data. Estimation based only on differences for the 2006-2008 period left our results almost unchanged relative to those reported. Another robustness check involved slightly changing the way in which we conducted our

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the first and second stages of the IV regression (this is the reverse of indirect least squares). Given that the coefficients in the first stages (reported in Appendix Tables B3 and B4) are 0.672 (for the change in risky wealth), and just below 0.6 (for the change in total financial wealth), the reduced form estimates would be smaller than our IV estimates. However, there are reasons to suppose that the reduced form would understate the relationship of interest. In particular: the change in calculated wealth is likely to overstate the true shock to wealth (and thus lead to an understatement of effects measured *per* euro of change in wealth) if households can offset some of the asset price shock through their portfolio choices; and, the reduced form would be affected by attenuation bias if there is measurement error. These issues were discussed in more detail in Bottazzi, Trucchi and Wakefield (2013).

instrumental variables analysis. As noted in section 3, the variation exploited by our instrument is heterogeneity between households in terms of the level of wealth held in different assets, and differences in returns between assets. We have tried including the (twice-lagged) level of wealth in different assets and the interaction of this with the stock-market index (the FTSEMIB) in the place of the constructed change in calculated wealth as the excluded variables in the first stage of our IV analysis. Again the results are almost unchanged relative to those we report (in fact the change sometimes improves the significance of our results). Another modification that makes practically no difference to our estimates is to drop regressors for (lagged) retirement status, sector of employment, and homeownership; in the results we report, these level variables are included alongside variables measuring the change in retirement status, housing wealth and employment. A final robustness check is to run the regressions with delta risky wealth as the key regressor, only on the sample of those who have risky wealth.[21] Since the coefficient on the key wealth variable measures the change in consumption per unit of change in wealth, including households without risky wealth (as we do in the reported results) should not affect our estimated coefficients and indeed dropping these households (and shifting to a much smaller sample) does not substantially affect our point estimates. Full results from the robustness checks described in this paragraph are available from the authors on request.

Other than the estimated wealth effects, the other coefficients that are reported in Tables 4.1 and 4.2 are coefficients on the variables that we most often found to be significant (full results for the regressions can be found in Appendix Tables B5 to B8). The patterns of results are in line with economic intuition: becoming unemployed (but not becoming retired) is associated with cuts in spending, while the addition of extra household members or of an extra earner in the household is linked to higher expenditures.

To summarise, the results discussed in this section give the average effect of the wealth shock on the consumption of households in our sample. Our favoured estimates indicate that a euro loss of risky wealth in the period of the stock-market crash led, on average, to an 8.8 (or 8.6 without the control for the change in labour income) cent cut in consumption, and 5.7 (5.5) cents of this cut was in spending on non-durable goods. Point estimates for the response to the change in total financial wealth are slightly larger, but less precisely estimated.

[21] More precisely the sample is those who had risky wealth in the appropriate (lagged) wave of data such that they contribute to the estimation of the coefficient on the instrumented wealth variable.

### *4.2 Results for Categories of Consumption Spending*

The results in the previous subsection are for broad categories of consumption spending. Theoretical considerations that "luxuries are easier to postpone" (Browning and Crossley, 2000), and findings that households in temporarily straitened circumstances may postpone the renewal of durables rather than immediately cutting back on all spending (Browning and Crossley, 2009), mean it is interesting to look at finer categories of spending. Aside from total consumption spending and spending on non-durables, our data allow us to look at spending on durables and spending on food.

Table 4.3 presents key coefficients for our wealth effect regressions for spending on food and durables, alongside the results for total spending and spending on non-durables (full sets of coefficients from the regressions are presented in Appendix Table B9). We present results from our preferred IV specification and with the key independent variable being the change in risky wealth (so that we do not have a problem of weak instruments[22]). Thus, the results for total consumption and non-durable consumption replicate those presented in the top panels of Tables 4.1 and 4.2.

**[Table 4.3 about here]**

The point estimates in columns (c1) and (c2) of the table indicate that durables expenditures were affected by, on average, 3.1 cents per year for a euro change in risky wealth. Since total consumption spending is the sum of spending on durables and spending on non-durables, the change in total spending per euro change in wealth should be the sum of the changes in spending on non-durables and durables, per euro change in wealth. Looking at the coefficients in columns (a1), (b1) and (c1), or in columns (a2), (b2) and (c2), we can see that this relationship does indeed hold. While this "adding up" is reassuring about the consistency of households' responses to the different consumption questions in the survey, the results for durables spending are not significant. In addition, coefficients on changes in house value are insignificant and close to zero in the specifications for durables. The lack of significance may in part be due to the fact that durable purchases happen only infrequently and so we do not observe enough durables purchases to identify patterns in the data.

[22] Given that the sample and regressors (including the endogenous regressor) do not change across the regressions reported, the "first stage" results are always those already discussed and presented in Appendix Table B3.

For food spending we again find no evidence of effects from housing wealth (coefficients are very small and have very small standard errors). For our main variable of interest, a euro change in the value of risky financial wealth is seen to lead to a cut in food spending of 1.5 cents per year and this result is significant at the 10% level (see columns (d1) or (d2) of Table 4.3). These results are potentially striking. If food is a necessity, then even small changes in food spending could be potentially important for households' welfare. However, we should be careful in interpretation. Our data on food spending are not very disaggregated and we cannot, for example, distinguish "food in" and "food out".[23] We next consider in more detail the interpretation of the magnitude of our estimated wealth effects.

### *4.3 How Large are these Wealth Effects?*

Our estimates of wealth effects are based on the early years of the Great Recession, and using this period helps us to have a plausibly exogenous source of variation in financial wealth that we exploit to identify effects. This exogeneity may give estimates that have generality outside our sample period, or it may be that the time period that we exploit is unusual in terms of average wealth effects. While we cannot investigate this directly, we can at least put our estimates in the context of previous literature.

Findings regarding wealth effects in consumption have usually focussed on broad measures such as total consumption or non-durable consumption. Our preferred point estimates for the mpc out of shocks to financial wealth are between 8.5 and 9 percent for total consumption, and around or just above 5.5 percent for non-durable consumption. These effects differ from the Italy based finding of Guiso, Paiella and Visco (2005) that consumption may even fall in response to capital gains on financial assets. One could only speculate as to whether this difference comes from differences in sample period or differences in the method and variation used to capture effects. It is slightly difficult to make a direct comparison of our results to those of Banks et al. (2012), the paper that is closest to ours in terms of methodology, since they do not observe such comprehensive measures of consumption spending as we do and their sample is for a restricted (older) age range. However, if we try to extrapolate an effect on total consumption from their results it would seem that this would be weaker than our findings. Our findings for spending on

[23] Based on a different dataset (a Household Budget Survey), Rondinelli, Bassanetti and Scoccianti (2014) do notice, for some groups of the population, differences in the evolution of expenditure shares on "food" and on "accommodation services and restaurants" during the 2000s (until 2012).

food are also stronger than the sum of their results for food in and food out. Compared to other, US based, results for wealth effects in the Great Recession, our mpc out of financial wealth is somewhat larger than the 3.3 percent found by Christelis, Georgarakos, and Jappelli (2015), but only slightly larger than the mpc out of housing wealth estimated by Mian, Rao and Sufi (2013). More generally our findings on mpc out of shocks to financial wealth do not seem out of line with findings in the literature (see for example the collection of micro-data based results in Table 3 of Paiella (2009)), although an estimate of 0.088 or 0.086 for total consumption is perhaps at the top end of the range.

Our findings on mpc from changes in housing wealth are (for total and non-durable consumption) robustly in the range 0.001 – 0.004. This is in line with the findings of Guiso, Paiella and Visco (2005). Thus our findings seem to confirm that the average marginal propensity of Italian households to consume from changes in their housing wealth is reasonably in line with (perhaps at the lower end of) the range of international estimates of this parameter.

Another way of thinking about the size of our estimated mpc is to consider what these mpc imply for how much smaller observed falls in consumption would have been in our data if the value of financial assets had not fallen in 2008. We can address this issue by performing counterfactual simulations based on our regression. That is to say, we first use the regression to predict the average change in consumption in our sample. We can then (counterfactually) set the change in wealth to zero for all individuals in our sample and make a new prediction.[24] Comparing the two predictions will give a measure of how much of the average fall in consumption is being driven by wealth effects. We can also compare this influence of wealth effects to the impact of other factors by using a similar technique to "switch off" the influence of (say) changes in housing wealth, unemployment status, the number of earners in the household, or in labour income.

**[Table 4.4 about here]**

Table 4.4 displays the results of this kind of counter factual exercise based on the IV regression for the change in total consumption on the change in risky wealth (and including the

[24] Our preferred estimates are IV regressions. The easiest way to perform this counterfactual analysis within the IV set up is to "manually" compute the two steps of the IV. That is, rather than using a built in package in to statistical software (in our case Stata 13) to compute the IV, use a regression command to compute the first stage, then construct the "predicted wealth" variable that becomes an input in to the second stage which is computed by a second use of the regression command. Since this procedure involves explicitly obtaining the "predicted wealth" variable, it is straightforward to produce predictions based on coefficients of the second stage regression but with the predicted wealth variable set to zero.

change in labour income), that is reported in the top panel and third column of Table 4.1. We report results for the counterfactual exercise computed across all households in our sample (first column of Table 4.4), and only for the (approximately) half of the sample whose change in consumption is measured for the period of particularly large asset price shocks (2006 – 08, second column of Table 4.4).

In our full sample the average two-year fall in annual consumption is 515 euros. This fall amounts to almost 3% of average consumption spending in our sample,[25] a figure which is reasonably in line with the fall in aggregate consumption in Italy over the same period (see Figure 1.1). Since we are using least-squares regression, the 515 euro fall is matched by the average prediction of consumption changes based on our regression. If we repeat the prediction exercise but with the "predicted wealth" variable from the first stage of the IV set to zero for those who have risky wealth, we find the average fall in consumption is reduced to 425 euros. Thus, wealth effects are explaining around 90 out of the 515 euro average fall, or approximately 17% of the fall in consumption on average. In contrast, changes in housing wealth only capture around 3% of the average fall in consumption. The part of the change in consumption explained by wealth effects is also very slightly larger than the proportions coming from either changes in labour income, or from the joint impact of changes in the number of earners *and* in unemployment status.

It may seem surprising that the change in the value of risky wealth is so powerful, relative to other factors, when only around 14% of our sample held risky financial wealth before the asset price shock (in 2004 or 2006). However, the shock to wealth was large. The results from our first stage indicate that the asset price shock led to an average fall in the value or risky wealth of 7130 euros among households with some risky wealth before the crisis, and combining this with our mpc estimate gives an average cut in consumption due to the wealth shock of 627 euros per year among these households. Averaging the size of the cut across all households (with and without risky wealth) gives us back the 90 euro result.

Considering only the 2006 – 08 sample, the average fall in consumption is now 796 euros (or around 4.5 per cent, which is again quite well in line with aggregate data).[26] In this case we see that the changes in financial wealth are driving more of the fall in consumption (around 22% of it) than are any of the other factors we consider through our counterfactuals: in this sample even the

[25] 3% is calculated as 100*515/17454.
[26] Since there is a "2010 dummy", this fall is again matched exactly by regression predictions.

composite effect of changes in the number of earners and in unemployment and in labour income, is not as strong as the effect of the shock to wealth.

### *4.4 Heterogeneity in Wealth Effects*

The wealth effects considered so far are average effects in our sample. The conceptual framework underpinning our research suggests that there might well be heterogeneity in wealth effects. We consider heterogeneity by age, and whether the strength of wealth effects is related to becoming pessimistic about the stock market or being exposed to mortgage debt.

*Heterogeneity by age*

The simple life-cycle model that we appealed to in section 3, predicts that agents should consume a proportion of their wealth in each period, and so should smooth out shocks to wealth by spreading the changes in spending that these shocks necessitate, across the remaining periods of their lives. Given that, all else equal, older individuals have a shorter horizon over which they can distribute changes in consumption spending, the model suggests that older individuals should respond more strongly to the wealth shocks.[27] A richer version of the model makes the prediction less clear cut. If households form links in ongoing familial dynasties, then the model may effectively have an infinite horizon thus potentially decoupling the link between age and the likely strength of responses to wealth shocks. Alternatively, credit constraints may mean that the consumption of younger households is closely tied to current resources, and so these households may be very responsive to shocks. Given the ambiguity, it is an empirical question to try to establish whether and how wealth effects vary with age.

With our instrumental variables strategy, precise identification is quite demanding. To mitigate problems with sample size and potentially weak instruments, our approach to investigating heterogeneity by age is to re-estimate our main model on the following subsamples: a sample excluding households headed by someone aged 70 or above; a sample excluding those aged less than 50; and, a sample excluding both the "young" (under 50s) and the "old" (70 plus). Each restriction drops around a quarter of the households from our main sample, so the sample with neither the old nor the young is slightly less than half the size of the sample used in Tables 4.1

[27] This kind of intuition underlies much work trying to untangle why house price growth and aggregate consumption are so strongly correlated in the UK: see Attanasio and Weber (1994); Attanasio et al (2009), Attanasio, Leicester and Wakefield (2011).

to 4.3. Particularly for the samples without the young households, F-statistics on first stage regressions indicate that we do not have a problem with weak instruments. Results for the age-restricted samples, with the change in risky wealth as the key regressor, and with the control for the change in labour income, are reported in the columns of table 4.5.

**[Table 4.5 about here]**

If we look first at the column for the most restricted sample (column 3), we see that the point estimate for the wealth effect on non-durable consumption increases by 60 -70 % relative to our baseline results (cf. Table 4.3), while that for total consumption is more than doubled, and these point estimates are significant at the 1% level. In an accounting sense, the relatively larger increase in the coefficient for total consumption comes from a large increase in the estimate of the effect for spending on durables, although the result for durables spending is not significant. If we instead look at the results in the other columns of Table 4.5 (and compare them to Table 4.3), we see that dropping the "old" from our sample increases estimated wealth effects for total and non-durable consumption (but has little effect on the coefficient for durables), while dropping the young leads to an increase in the wealth effect for total consumption that is largely accounted for by an increase in the coefficient for spending on durables (though these results without the young are less precise than results in the other columns).

Since formal tests do not reject that the wealth effects reported in Table 4.5 are equal to the point estimates based on our full sample, some caution is needed in interpreting how restricting the age range of the sample affects our results. Nonetheless, the evident pattern in the results is that dropping the oldest and/or youngest households from our sample leads to larger estimated wealth effects. The increase in the parameters when dropping the youngest households is in line with the prediction of the lifecycle model that responses to wealth shocks might get stronger with age. It is more surprising that our estimates also get stronger when we drop the oldest households from our sample. It may though be relevant that the ownership rate of risky assets among households aged 70+ in our sample is around 10%, which is noticeably lower than the 15 to 17% rates among younger age groups (see Appendix Table B10).[28] It is possible that the eldest households who own risky assets are unusually selected and so display atypical responses to shocks.

[28] The lower ownership rate among the eldest is likely to reflect both age and cohort effects.

*Wealth effects and stock-market expectations*

A forward looking model of consumption and savings decisions predicts that households should respond more strongly to shocks if they perceive them to be permanent. An agent that has access to smoothing mechanisms has little need to adjust spending in response to a wealth shock if she expects the value of wealth to recover; on the other hand an agent that believes that the shock to asset values has permanent consequences for the value of lifetime wealth should scale back consumption. This is one of the issues investigated by Christelis, Georgarakos and Jappelli (2015) for the Great Recession period in the US. Those authors point out that investigating this issue for shocks to financial wealth will almost certainly require the use of data that include information on subjective expectations about the likely performance of the stock market, and with such data they find evidence that those who expected the stock-market shock to be permanent adjusted their consumption more strongly than those who expected the shock to be transitory.

Our data include a question on households' expectations of the value of the stock market over the twelve months after they are surveyed, which is asked of approximately half the households in the dataset. Using this variable we are able to construct an indicator of whether households are "pessimistic" about the stock market, in the sense that they attach a probability lower than 50% to the event of obtaining a profit from investing in the Italian stock market over the next twelve months, or whether they expect positive capital gains with a higher probability and so are "non-pessimistic". To use this information in our differenced empirical model, we then construct a "become pessimistic" indicator to show that a household switches to become pessimistic between the two waves between which the change in consumption is measured. We find that around 12 per cent of our regression sample (with the relevant data) become pessimistic, but this likelihood is almost doubled for households that hold risky wealth (see Appendix Table B11).

To investigate how stock-market expectations affect the strength of wealth effects, we add the "become pessimistic" indicator, and its interaction with the change in risky financial wealth, to our baseline specifications. Results are reported for total spending and nondurable spending, in Table 4.6. Since the "become pessimistic" variable is only available for a subsample of our data, we also report new versions of the baseline regressions that are based on the subsample. Some care is needed with interpretation since the addition of these variables and reduction in the sample size

does weaken our instruments. Nonetheless, comparing the columns with and without the pessimism variables, there is a clear pattern of point estimates that suggests that households that revised down their expectations of stock-market performance responded more strongly to the wealth shock (and the coefficients on the wealth variable and the interaction variable are jointly significant). Since adding the pessimism variable but not the interaction (not reported but available on request), does not affect the estimated wealth effects compared to the baseline, we cautiously conclude that changing expectations about the stock market had an important impact on responses to the wealth shock. This result is in line with finding in Christelis, Georgarakos and Jappelli (2015).

**[Table 4.6 about here]**

*Wealth effects and mortgage holding*

Regarding the extent of cut back in consumption in the US during the Great Recession, Atif Mian and Amir Sufi have argued forcefully that the exposure of low wealth or (particularly) indebted households to losses in housing wealth, and strong consumption responses (high mpc) by these households, played an important role.[29] In line with this, we look at whether indebted households responded more strongly than others to the wealth shock we are investigating. To do this we introduce an indicator of holding a mortgage, and the interaction of this with our financial wealth variable, into our specification for identifying wealth effects;[30] results are reported for total spending and nondurable spending, in Table 4.7.

**[Table 4.7 about here]**

Since the mortgage indicator is available only for a subsample of our data, we also report new versions of the baseline regressions that are based on the subsample. Some care is needed with interpretation since tests on the first stage regressions indicate a weak instruments problem for the interaction terms. That said, comparing the columns with and without the mortgage variables, there is a clear pattern of point estimates that suggests that households that have mortgages responded more strongly to the wealth shock. Thus our results are in line with the idea that

[29] The mechanisms underlying the role of "levered losses" in generating strong consumption responses are discussed at length in Mian and Sufi (2014), while evidence on the stronger consumption responses of more indebted households is presented in Mian, Rao and Sufi (2013).

[30] Given that our IV strategy exploits (lagged) information on holdings of financial assets, introducing interactions of measures of the level of financial wealth into our specification would be problematic. The mortgage indicator does not present this problem.

indebted households respond more strongly to shocks to wealth (or at least to a negative shock to wealth). On the other hand, we do not believe that our results point to the importance of the role of "levered losses" in the same way that the results of Mian and Sufi do (we borrow the "levered losses" terminology from those authors). In particular, whereas shocks to house values directly affect the wealth of all home-owners, including large numbers with mortgage debt (for whom the losses have particularly large consequences for net worth), in our sample only around 1 in 7 of those who suffered losses in risky financial wealth were exposed to mortgage debt. The importance of wealth effects in driving consumption changes in our sample comes in large part from the fact that also households that did not have mortgages responded to the wealth shock.

## *5. Conclusions*

In common with other developed economies, the start of the Great Recession was marked in Italy by a sudden and substantial fall in the value of financial assets. We have used this as a plausibly exogenous source of variation in financial wealth in an IV estimator (based on Banks et al., 2012) of the marginal propensity to consume out of shocks to financial wealth.

Our findings indicate that a one euro fall in risky financial wealth resulted in households cutting annual total consumption spending by between 8.5 and 9 cents, and slightly more than 5.5 cents of this cut was in spending on non-durable goods and services. We find effects of around 1.5 cents for food spending, and insignificant results (though with the expected positive coefficients) for expenditure on durables. We also find that a one euro change in housing wealth results in total and nondurable consumption spending moving in the same direction by around between 0.2 and 0.3 cents, but we do not find significant effects on food or durables expenditures.

To help quantify the importance of these wealth effects, we constructed counterfactual exercises to simulate how much of the average fall in consumption in our sample is accounted for by shocks to financial wealth. The average proportional fall in consumption for individuals in our sample was in line with the fall in aggregate consumption in the Italian economy, and the counterfactual exercise indicates that for these individuals around 17 to 22 percent of the fall in consumption was a response to shocks to the value of financial wealth. This average effect is at least as large as the change in consumption spending accounted for by cuts in labour income or by the combined impact of changes in the number of earners *and* in unemployment status.

The effects mentioned thus far are average effects in our sample. We also look at heterogeneity of effects across groups of the population. Some care must be adopted when interpreting the results of these exercises since the data intensive nature of our preferred estimator, and limitations of sample size, can lead to problems with significance and weak instruments. Nonetheless, we cautiously conclude that our results become somewhat stronger if we exclude the oldest and youngest households from our data. We also find evidence that indicates stronger reductions in consumption in response to the shock to wealth: for households who also became pessimistic about how they expected the stock market to perform; and, among households with some mortgage debt.

Applying our method requires a period of large shocks to asset prices. Thus we considered wealth effects in the early part of the Great Recession in Italy. While we therefore need to be careful about claiming too much generality for our results, episodes of negative asset price shocks do make the study of wealth effects painfully relevant. We feel that our findings that households did contract consumption due to wealth shocks highlight that wealth effects in consumption are important. They are important both for the welfare of households that suffer the shocks and as a mechanism through which such shocks feed back into aggregate consumption and, therefore, economic activity.

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## *Appendix A: Constructing the "Calculated Change in Wealth"*

Sources for asset price indices and interest rates, and the asset classes that they are applied to in constructing calculated changes in wealth, are:

- Holdings in current accounts and cash deposits: the annual interest rate on current accounts available to households (source: Bank of Italy, Bolletino Statistico).
- Short term Italian government bonds (duration lower than 2 years, assumed to be held to maturity): interest rates yielded by BOT with 12 months duration and by CTZ traded in Borsa Italiana (source: Bank of Italy).
- Long-term Italian government bonds (CCT and BTP): capital gains based on price indices available from the Bank of Italy.
- Shares held in Italy: FTSEMIB (FTSE via datastream)
- Shares held overseas: FTSE All-World index (FTSE via datastream)
- Italian private bonds and other foreign assets, Pfandbriefe index.

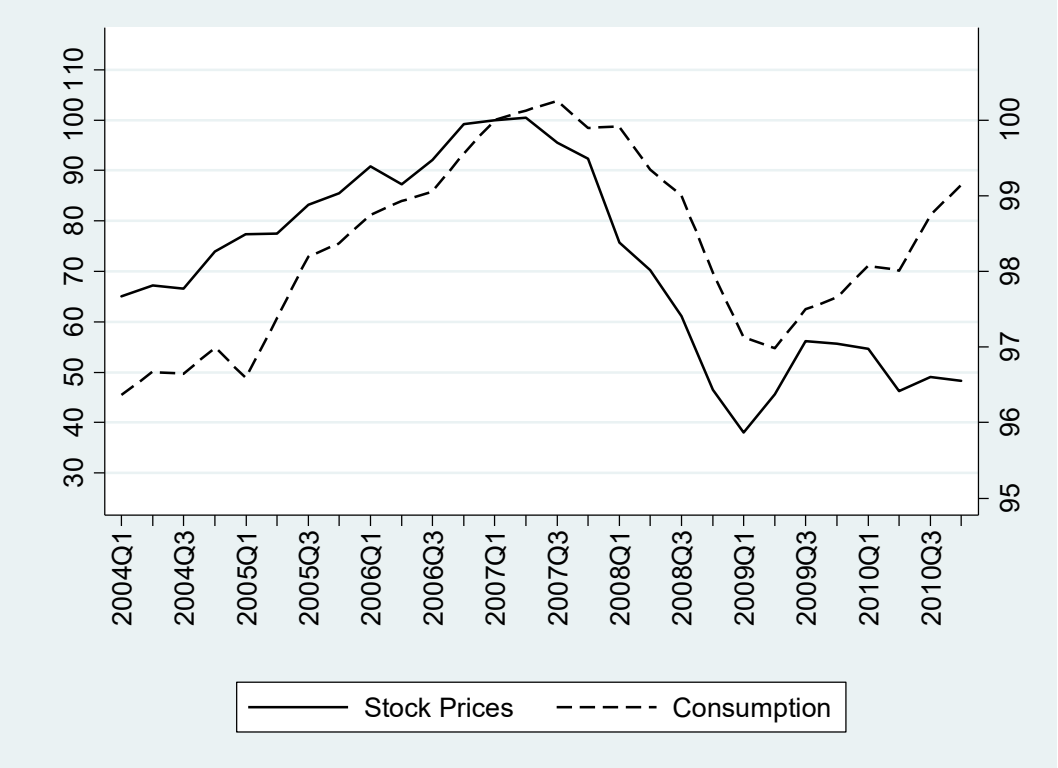
To classify mutual funds according to exposure to stock market risk we use the classification provided by the Italian association of savings providers (Assogestioni, *Guida alla classificazione*). We then assume the amount invested in the stock market evolves in line with the FTSEMIB and that the remainder of the fund is invested in Italian government bonds. In detail, the share of government bonds is 100% for monetary and bond funds; 15% for stock funds; 50% for mixed funds; 30% for balanced stock funds; 70% for balanced bond funds.

## *Appendix B: Supplementary Tables*

**[Appendix Tables B1 to B11 about here]**

## *Figures and Tables*

**Figure 1.1:** ***Stock prices and Aggregate Consumption Spending in Italy, 2004 – 2010***




Source: FTSE via datastream for stock prices (FTSEMIB) and Istat (database I.stat) for consumption (final consumption expenditure of households on economic territory).

Notes: The vertical axis on the LHS measures the variation of stock prices with respect to the first quarter of 2007 (the value of FTSEMIB in the reference period is set equal to 100); the axis on the RHS measures the variation of consumption with respect to the first quarter of 2007.

## *Table 2.1: Descriptives of consumption in our sample*

| | | *Total consumption expenditure* | *Non-durables consumption expenditure* | *Durables consumption expenditure* | Food *consumption expenditure* |
|---|---|---|---|---|---|
| **2004** | Mean | 18784 | 16630 | 2154 | 7074 |
| | St. dev | (12589) | (9103) | (7205) | (3676) |
| **2006** | Mean | 18304* | 16411 | 1893* | 6918* |
| | St. dev | (11179) | (8528) | (5773) | (3433) |
| **2008** | Mean | 17541*** | 15796*** | 1745 | 6522*** |
| | St. dev | (10515) | (7943) | (5210) | (3108) |
| **2010** | Mean | 17295 | 15859 | 1436*** | 6391* |
| | St. dev | (9945) | (8130) | (4149) | (3064) |

**Notes to Table:**
3047 observations in 2004; 3867 in 2006; 3865 in 2008 and 3323 in 2010.
Stars refer to the significance of the test on equality of mean consumption in the current and previous wave (with equal variances): * p<0.1, **p<0.05, *** p<0.001.

## *Table 3.1: Descriptives of the change in wealth and the calculated change in wealth*

| **Financial wealth** | | | |
|---|---|---|---|
| | | **Changes in reported wealth** | **Changes in "calculated" wealth** |
| Mean (st.dev) | | -248 (56766) | -1397 (8050) |
| | 2008 | -1259 (46455) | -2829 (11431) |
| | 2010 | 678 (64787) | -85 (909) |
| Median | | 0 | -114 |
| 25$^{th}$ percentile | | -4727 | -369 |
| 75$^{th}$ percentile | | 5832 | -14 |
| Regression coefficient | | | 0.649*** |
| | | | (0.088) |
| **Risky financial wealth (hhs with risky assets in 2006)** | | | |
| | | **Changes in reported wealth** | **Changes in "calculated" wealth** |
| Mean (st.dev) | | -12814 (57000) | -4823 (17795) |
| | 2008 | -24957 (70442) | -10678 (24269) |
| | 2010 | -1540 (37431) | 612 (1748) |
| Median | | -3073 | 13 |
| 25$^{th}$ percentile | | -20397 | -1209 |
| 75$^{th}$ percentile | | 0 | 238 |
| Regression coefficient | | | 0.882*** |
| | | | (0.102) |

**Notes to Table:**
The sample is the same that is used in our wealth effects regressions. Number of observations: 6370 observations, (3047 in 2008 and 3323 in 2010) from 3867 families. 441 households in 2008 and 475 in 2010, were share owners in 2006.
Monetary values are in 2010 euros. The regression coefficient is obtained by OLS regression of the change in reported wealth on the constructed change in wealth (and a constant).

***Table 4.1: Wealth effects regressions for the change in total household consumption***

Dependent variable: Change in household consumption expenditure

| | OLS | | IV 2nd Stage | |
|---|---|---|---|---|
| | **Including Δ Labour Income** | **No Control for Income** | **Including Δ Labour Income** | **No Control for Income** |
| *Wealth variable: Δ Risky financial wealth* | | | | |
| **Delta risky financial wealth** | **0.016 ** ** | **0.016 ** ** | **0.088 * ** | **0.086 * ** |
| | **(0.007)** | **(0.007)** | **(0.047)** | **(0.047)** |
| **Delta house value** | **0.004 *** ** | **0.004 *** ** | **0.003 *** ** | **0.003 *** ** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.079 *** | | 0.079 *** | |
| | (0.020) | | (0.020) | |
| Delta unemployment status | -1556.171 ** | -1846.143 *** | -1481.319 ** | -1773.569 *** |
| | (612.166) | (616.947) | (618.512) | (623.452) |
| Delta retirement status | 425.789 | 392.921 | 569.728 | 532.158 |
| | (466.871) | (471.705) | (480.620) | (484.088) |
| Delta no. of people in the HH | 2026.098 *** | 2263.764 *** | 1930.572 *** | 2171.226 *** |
| | (294.384) | (292.070) | (292.252) | (292.015) |
| Delta no. of earners in the HH | 1001.949 *** | 1583.958 *** | 1039.473 *** | 1619.893 *** |
| | (297.572) | (276.589) | (297.779) | (275.373) |
| Year 2010 | 295.468 | 125.952 | 224.320 | 57.242 |
| | (575.785) | (579.205) | (580.768) | (583.006) |
| *Wealth variable: Δ Total accessible financial wealth* | | | | |
| **Delta financial wealth** | **0.002** | **0.004** | **0.100** | **0.099** |
| | **(0.003)** | **(0.003)** | **(0.070)** | **(0.071)** |
| **Delta house value** | **0.004 *** ** | **0.004 *** ** | **0.001** | **0.001** |
| | **(0.001)** | **(0.001)** | **(0.002)** | **(0.003)** |
| Delta labour income | 0.078 *** | | 0.042 | |
| | (0.020) | | (0.037) | |
| Delta unemployment status | -1569.980 ** | -1852.280 *** | -1427.671 ** | -1586.125 ** |
| | (610.928) | (616.057) | (659.231) | (679.909) |
| Delta retirement status | 395.724 | 364.399 | 446.971 | 428.463 |
| | (469.031) | (473.835) | (733.326) | (724.879) |
| Delta no. of people in the HH | 2045.942 *** | 2278.874 *** | 2005.018 *** | 2133.766 *** |
| | (295.844) | (293.382) | (305.885) | (311.227) |
| Delta no. of earners in the HH | 996.616 *** | 1572.502 *** | 1168.668 *** | 1479.847 *** |
| | (298.533) | (276.870) | (339.568) | (308.515) |
| Year 2010 | 305.420 | 131.868 | -30.916 | -117.272 |
| | (576.194) | (579.429) | (682.737) | (657.514) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.

Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.

Coefficients in bold can be interpreted as mpc out of wealth change. Also included: homeownership, retirement and self-employment in the previous wave, age dummies (40-49, 50-59, 60-69, 70+), education dummies (medium and high education), gender, regional unemployment rate, regional dummies, constant term.

Detailed results from the first stage regressions for the IV models are included in Appendix Table B3; F-statistics from "weak instrument" tests are: top panel, 14.61 (column 3) and 14.51 (column 4); bottom panel, 5.11 (column 3 including change in labour income) and 5.13 (column 4).

***Table 4.2: Wealth effects regressions for household consumption of non-durables***

Dependent variable: Change in household expenditure on non-durables.

| | OLS | | IV 2nd Stage | |
|---|---|---|---|---|
| | **Including Δ Labour Income** | **No Control for Income** | **Including Δ Labour Income** | **No Control for Income** |
| *Wealth variable: Δ Risky financial wealth* | | | | |
| **Delta risky financial wealth** | **0.016 *** ** | **0.016 *** ** | **0.057 ** ** | **0.055 * ** |
| | **(0.005)** | **(0.006)** | **(0.028)** | **(0.029)** |
| **Delta house value** | **0.003 *** ** | **0.003 *** ** | **0.002 *** ** | **0.002 *** ** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.058 *** | | 0.058 *** | |
| | (0.016) | | (0.016) | |
| Delta unemployment status | -1165.150 *** | -1377.210 *** | -1123.289 *** | -1337.046 *** |
| | (396.578) | (399.493) | (401.656) | (404.731) |
| Delta retirement status | -352.065 | -376.102 | -271.566 | -299.045 |
| | (323.674) | (325.511) | (324.924) | (326.027) |
| Delta no. of people in the HH | 1784.869 *** | 1958.676 *** | 1731.445 *** | 1907.463 *** |
| | (213.312) | (212.648) | (214.925) | (215.251) |
| Delta no. of earners in the HH | 940.634 *** | 1366.262 *** | 961.619 *** | 1386.149 *** |
| | (223.564) | (198.373) | (223.897) | (198.489) |
| Year 2010 | 222.021 | 98.052 | 182.231 | 60.027 |
| | (412.706) | (416.229) | (413.681) | (416.880) |
| *Wealth variable: Δ Total accessible financial wealth* | | | | |
| **Delta financial wealth** | **0.003** | **0.005 ** ** | **0.062 * ** | **0.061** |
| | **(0.002)** | **(0.002)** | **(0.036)** | **(0.037)** |
| **Delta house value** | **0.003 *** ** | **0.003 *** ** | **0.001** | **0.001** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.057 *** | | 0.035 | |
| | (0.016) | | (0.022) | |
| Delta unemployment status | -1177.262 *** | -1380.942 *** | -1092.602 ** | -1224.290 *** |
| | (395.310) | (398.558) | (429.604) | (439.629) |
| Delta retirement status | -382.644 | -405.245 | -352.157 | -367.538 |
| | (326.928) | (328.934) | (481.610) | (473.220) |
| Delta no. of people in the HH | 1804.936 *** | 1972.997 *** | 1780.590 *** | 1887.590 *** |
| | (213.672) | (213.050) | (222.560) | (226.206) |
| Delta no. of earners in the HH | 937.863 *** | 1353.366 *** | 1040.217 *** | 1298.831 *** |
| | (223.419) | (198.625) | (240.356) | (206.872) |
| Year 2010 | 226.944 | 101.726 | 26.857 | -44.912 |
| | (412.649) | (415.868) | (455.016) | (445.911) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.

Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.

Coefficients in bold can be interpreted as mpc out of wealth change. Also included: homeownership, retirement and self-employment in the previous wave, age dummies (40-49, 50-59, 60-69, 70+), education dummies (medium and high education), gender, regional unemployment rate, regional dummies, constant term.

Detailed results from the first stage regressions for the IV models are included inAppendix Table B3; F-statistics from "weak instrument" tests are: top panel, 14.61 (column 3) and 14.51 (column 4); bottom panel, 5.11 (column 3 including change in labour income) and 5.13 (column 4).

*Table 4.3: Wealth effect coefficients: IV regressions for categories of consumption expenditure*

| **Dependent variable:** | ***Δ Total C*** | | ***Δ Non-durable C*** | | ***Δ Durables expenditure*** | | ***Δ Food expenditure*** | |
|---|---|---|---|---|---|---|---|---|
| | **(a1)** | **(a2)** | **(b1)** | **(b2)** | **(c1)** | **(c2)** | **(d1)** | **(d2)** |
| *Wealth variable: Δ Risky financial wealth* | | | | | | | | |
| **Delta risky financial wealth** | **0.088 *** | **0.086 *** | **0.057 **** | **0.055 *** | **0.031** | **0.031** | **0.015 *** | **0.015 *** |
| | **(0.047)** | **(0.047)** | **(0.028)** | **(0.029)** | **(0.041)** | **(0.040)** | **(0.008)** | **(0.008)** |
| **Delta house value** | **0.003 ***** | **0.003 ***** | **0.002 ***** | **0.002 ***** | **0.001** | **0.001** | **0.000** | **0.000** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** | **(0.000)** | **(0.000)** |
| Delta labour income | 0.079 *** | | 0.058 *** | | 0.021 *** | | 0.009 ** | |
| | (0.020) | | (0.016) | | (0.008) | | (0.004) | |

**Notes to table:** Number of observations: 6370 observations from 3867 families.
Significance: * p<0.1, **p<0.05, *** p<0.001.
Coefficients in bold can be interpreted as mpc out of wealth change. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.
Also included: homeownership, retirement and self-employment in the previous wave, age dummies (40-49, 50-59, 60-69, 70+), education dummies (medium and high education), gender, regional unemployment rate, regional dummies, constant.
Detailed results from the first-stage regressions for the IV models are included inAppendix Table B3. F-statistics from "weak instrument" tests are: 14.61 (including change in labour income) and 14.51 (no control for change in labour income); bottom panel.

***Table 4.4: Counterfactual Exercises: Predicted Changes in Consumption***

| | *Full Sample* | *2006 – 08 Sample* |
|---|---|---|
| Average observed change in total consumption | -515 (100%) | -796 (100%) |
| Counterfactual changes | | |
| Δ risky financial wealth set to 0 | -425 (83%) | -619 (78%) |
| Δ housing value set to 0 | -498 (97%) | -770 (97%) |
| Δ labour income set to 0 | -437 (85%) | -753 (95%) |
| Δ no earners in the HH set to 0 | -494 (96%) | -781 (98%) |
| No unemployment | -464 (90%) | -748 (94%) |
| Δ no earners set to 0 *and* no unemployment | -443 (86%) | -733 (92%) |
| Δ no earners *and* Δ labour income set to 0 *and* no unemployment | -365 (71%) | -690 (87%) |

**Notes to table:** These counterfactuals are based on the IV regression reported in the top panel of Table 4.1, including Δ labour income (column 2).
The full sample size is 6370 while the 2006-08 sample has 3047 observations. The mean level of consumption is 17454 in the full sample and 17627 in the 2006-08 subsample. The percentages in parentheses are the percentage of the average observed change.

### *Table 4.5: Heterogeneity in key regression coefficients by age (IV 2nd stage)*

| | Age < 70 | Age 50+ | Age 50-69 |
|---|---|---|---|
| *Dependent variable: Δ Total consumption* | | | |
| **Delta risky financial wealth** | **0.114 *** | **0.131 *** | **0.218 ***** |
| | **(0.059)** | **(0.070)** | **(0.084)** |
| **Delta house value** | **0.004 **** | **0.003 **** | **0.002** |
| | **(0.001)** | **(0.001)** | **(0.002)** |
| Delta labour income | 0.077 *** | 0.077 *** | 0.073 *** |
| | (0.022) | (0.019) | (0.019) |
| *Dependent variable: Δ Non-durables consumption* | | | |
| **Delta risky financial wealth** | **0.075 **** | **0.056** | **0.095 ***** |
| | **(0.032)** | **(0.036)** | **(0.035)** |
| **Delta house value** | **0.002 *** | **0.003 ***** | **0.002** |
| | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.054 *** | 0.056 *** | 0.047 *** |
| | (0.016) | (0.016) | (0.016) |
| *Dependent variable: Δ Durables consumption* | | | |
| **Delta risky financial wealth** | **0.039** | **0.075** | **0.123** |
| | **(0.054)** | **(0.054)** | **(0.085)** |
| **Delta house value** | **0.002** | **0.000** | **0.000** |
| | **(0.001)** | **(0.001)** | **(0.002)** |
| Delta labour income | 0.023 *** | 0.021 ** | 0.026 ** |
| | (0.009) | (0.010) | (0.011) |
| *Dependent variable: Δ Food consumption* | | | |
| **Delta risky financial wealth** | **0.016** | **0.017** | **0.021** |
| | **(0.010)** | **(0.012)** | **(0.019)** |
| **Delta house value** | **-0.000** | **0.000** | **-0.000** |
| | (0.000) | (0.000) | (0.001) |
| Delta labour income | 0.008 ** | 0.009 * | 0.007 |
| | (0.004) | (0.005) | (0.004) |

**Notes to table:** Number of observations: 4335 observations if age<70; 4885 if age 50+; 2850 if age 50-69. Coefficients in bold can be interpreted as mpc out of wealth change.
Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household. Also included: homeownership, retirement and self-employment in the previous wave, age dummies (40-49, 50-59, 60-69 in columns 1 and 2; 60-69, 70+ in columns 3 and 4; 60-69 in columns 5 and 6), education dummies (medium and high education), gender, regional unemployment rate, region, 2010 dummy, change in: unemployment status, retirement status, no. of people in the household, no. of earners in the household and constant term. F-statistics from weak identification tests are, in order of columns: age<70: 9.18 and 9.04; age 50+: 22.09 and 22.14; age 50-69: 13.97 and 13.99.

### *Table 4.6: Wealth effects regressions for the change in household consumption, controlling for change in expectations*

| Dependent variable: | Δ total consumption: IV | | Δ non-durable consumption: IV | |
|---|---|---|---|---|
| | Not Controlling for change in expectations | Controlling for change in expectations | Not Controlling for change in expectations | Controlling for change in expectations |
| **Delta risky financial wealth** | **0.096 *** | **0.055** | **0.069 **** | **0.052** |
| | **(0.057)** | **(0.052)** | **(0.032)** | **(0.034)** |
| **Delta risky fin. wealth*Bec. Pessimist** | | **0.193** | | **0.074** |
| | | **(0.131)** | | **(0.063)** |
| Become Pessimist | | 557.272 | | -472.651 |
| | | (661.734) | | (493.826) |
| **Delta house value** | **0.001** | **0.001** | **0.002 **** | **0.002 **** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.117 *** | 0.115 *** | 0.096 *** | 0.096 *** |
| | (0.028) | (0.026) | (0.021) | (0.020) |

**Notes to table:** Number of observations: 3327 from 2089 families. Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household. The Chi squared statistic for the null hypothesis that the coefficient for *Delta risky financial wealth* plus its interaction with *Become Pessimistic* are equal to zero is 4.137 (pvalue 0.042) for total consumption and 5.379 (pvalue 0.020) for non-durable consumption.
Coefficients in bold can be interpreted as mpc out of wealth change. Also included: a constant; homeownership, retirement and self-employment in the previous wave; age dummies (40-49, 50-59, 60-69, 70+), education dummies (medium and high education), gender, regional unemployment rate, region, 2010 dummy; change in: unemployment status, retirement status, no. of people in the household, no. of earners in the household. -statistics from "weak instrument" tests are: 6.12 when not controlling for expectations (first stage for columns 1 and 3); and, 4.69 for *Delta risky financial wealth* and 2.92 for *Delta risky fin. wealth*Bec. Pessimist* when controlling for expectations (first stages for columns 2 and 4).

### *Table 4.7: Wealth effect coefficients: IV regressions; heterogeneity by leverage position*

| Dependent variable: | Δ total consumption: IV | | Δ non-durable consumption: IV | |
|---|---|---|---|---|
| | Not Controlling for mortgage holding | Controlling for mortgage holding | Not Controlling for mortgage holding | Controlling for mortgage holding |
| **Delta risky financial wealth** | **0.088 *** | **0.080 *** | **0.058 **** | **0.053 *** |
| | **(0.047)** | **(0.047)** | **(0.028)** | **(0.028)** |
| **Delta risky financial wealth*Hh has a mortgage** | | **0.159** | | **0.095** |
| | | **(0.209)** | | **(0.091)** |
| Hh has a mortgage | | 988.966 * | | 792.330 ** |
| | | (533.649) | | (354.969) |
| **Delta house value** | **0.003 **** | **0.003 **** | **0.002 **** | **0.002 **** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.075 *** | 0.074 *** | 0.054 *** | 0.054 *** |
| | (0.020) | (0.020) | (0.016) | (0.016) |

**Notes to table:** Observations: 5536 from 3630 families. Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household. The Chi-squared statistic for the null hypothesis that the coefficient for *Delta risky financial wealth* plus its interaction with *Hh has a mortgage* are equal to zero is 1.33 (p-value 0.249) for total consumption and 2.73 (p-value 0.098) for non-durable consumption.
Coefficients in bold can be interpreted as mpc out of wealth change. Also included: a constant; homeownership, retirement and self-employment in the previous wave; age dummies (40-49, 50-59, 60-69, 70+), education dummies (medium and high education), gender, regional unemployment rate, region, 2010 dummy; change in: unemployment status, retirement status, no. of people in the household, no. of earners in the household. F-statistics from "weak instrument" tests are: 14.54 when not controlling for mortgage holding (1st stage for columns 1 and 3); and, 8.00 (Delta risky financial wealth) and 2.12 (interaction) when controlling for mortgage holding (1st stages for columns 2 and 4).

## *Appendix Table B1: Fixed effects regressions for consumption*

| | *Total consumption* | | *Non-durable consumption* | |
|---|---|---|---|---|
| Year 2006 | -166.596 | 221.497 | 73.790 | 232.037 |
| | (201.709) | (218.924) | (137.076) | (148.923) |
| Year 2008 | -611.414 *** | -43.232 | -351.571 ** | -27.835 |
| | (207.856) | (222.130) | (141.253) | (151.104) |
| Year 2010 | -593.628 *** | -168.708 | -219.549 | 44.279 |
| | (230.087) | (238.774) | (156.360) | (162.426) |
| Own risky assets | | 3867.678 *** | | 2060.065 *** |
| | | (446.388) | | (303.655) |
| Own risky assets*2006 | | -2176.963 *** | | -806.266 ** |
| | | (541.973) | | (368.677) |
| Own risky assets*2008 | | -3551.314 *** | | -2081.921 *** |
| | | (565.730) | | (384.838) |
| Own risky assets*2010 | | -2993.923 *** | | -2043.553 *** |
| | | (622.968) | | (423.774) |
| R-squared | 0.262 | 0.279 | 0.307 | 0.316 |

**Notes to Table:** 14102 observations from 3867 households. * p<0.1, **p<0.05, *** p<0.001.
Also included: homeownership, house value, unemployment, retirement and self-employment, age dummies (40-49, 50-59, 60-69, 70+), education, no. of people in the household, no. earners in the household, regional unemployment rate, constant term.
Standard errors in parenthesis.

## *Appendix Table B2: Descriptive statistics for Independent Variables*

| | *All* | | *Hhs without risky assets in 2006* | | *Hhs with risky assets in 2006* | |
|---|---|---|---|---|---|---|
| | Mean | *St. dev.* | Mean | *St. dev.* | Mean | *St. dev.* |
| Delta house value | -5911.87 | *190177.55* | -3988.93 | *168810.79* | -17361.35 | *285947.67* |
| Delta labour income | -994.90 | *15654.59* | -731.57 | *13002.92* | -2562.78 | *26369.08* |
| Medium education | 0.314 | *0.464* | 0.286 | *0.452* | 0.481 | *0.500* |
| High education | 0.084 | *0.277* | 0.067 | *0.249* | 0.187 | *0.390* |
| Delta employment status | 0.035 | *0.183* | 0.037 | *0.190* | 0.019 | *0.135* |
| Delta retirement status | 0.074 | *0.261* | 0.072 | *0.259* | 0.083 | *0.276* |
| Year 2010 | 0.522 | *0.500* | 0.522 | *0.500* | 0.519 | *0.500* |
| Age 40-49 | 0.184 | *0.388* | 0.182 | *0.386* | 0.197 | *0.398* |
| Age 50-59 | 0.227 | *0.419* | 0.215 | *0.411* | 0.297 | *0.457* |
| Age 60-69 | 0.221 | *0.415* | 0.216 | *0.411* | 0.249 | *0.433* |
| Age 70+ | 0.319 | *0.466* | 0.338 | *0.473* | 0.212 | *0.409* |
| Δ no. of people in the HH | -0.085 | *0.453* | -0.083 | *0.456* | -0.096 | *0.433* |
| Δ no. of earners in the HH | -0.020 | *0.521* | -0.018 | *0.528* | -0.029 | *0.477* |
| Regional unemployment rate (%) | 8.000 | *3.788* | 8.377 | *3.837* | 5.757 | *2.504* |
| Male | 0.549 | *0.498* | 0.523 | *0.499* | 0.703 | *0.457* |
| Retired (previous wave) | 0.380 | *0.485* | 0.378 | *0.485* | 0.394 | *0.489* |
| Public sector (prev. wave) | 0.221 | *0.415* | 0.211 | *0.408* | 0.279 | *0.449* |
| Homeowner (prev. wave) | 0.747 | *0.435* | 0.729 | *0.445* | 0.854 | *0.354* |

**Notes to table:** 6370 observations from 3867 families; 5454 do not own risky assets; 916 own risky assets.

## *Appendix Table B3: First stage of two-stage least squares*

Dependent variable: Δ Risky financial assets

| | **Including Δ Labour Income** | **No Control for Income** |
|---|---|---|
| Calculated delta risky fin. wealth | 0.672 *** | 0.672 *** |
| | (0.176) | (0.176) |
| Delta house value | 0.008 * | 0.008 * |
| | (0.004) | (0.004) |
| Delta labour income | 0.004 | |
| | (0.049) | |
| Delta unemployment status | -1335.731 ** | -1351.300 ** |
| | (665.475) | (619.538) |
| Delta retirement status | -1808.050 | -1809.844 |
| | (1377.481) | (1381.384) |
| Delta no. of people in the HH | 987.924 ** | 1000.759 ** |
| | (422.711) | (439.200) |
| Delta no. of earners in the HH | -737.572 | -706.223 |
| | (584.488) | (496.345) |
| Year 2010 | 1065.281 | 1056.149 |
| | (1092.047) | (1059.393) |
| Age 40 – 49 | -1208.210 | -1201.859 |
| | (956.548) | (992.871) |
| Age 50 - 59 | -985.373 | -978.527 |
| | (795.046) | (780.297) |
| Age 60 – 69 | -831.594 | -828.918 |
| | (1120.234) | (1122.293) |
| Age 70+ | -1123.447 | -1119.585 |
| | (1047.313) | (1051.365) |
| Medium education | -1411.270 ** | -1412.336 ** |
| | (685.759) | (683.204) |
| High education | -843.732 | -849.912 |
| | (1626.763) | (1645.141) |
| Regional unemployment rate | 154.886 | 158.510 |
| | (711.598) | (703.920) |
| Male | -561.057 | -564.116 |
| | (504.619) | (497.618) |
| Retired (t-1) | -975.681 | -972.787 |
| | (748.877) | (743.309) |
| Public sector employee (t-1) | 1.089 | 2.092 |
| | (675.971) | (673.475) |
| Homeowner (t-1) | -55.297 | -55.715 |
| | (330.793) | (329.862) |
| Constant | 1462.143 | 1438.102 |
| | (3905.239) | (3876.776) |

**Notes to table:** These first-stage results relate to second stage results reported in Tables 4.1, 4.2 and 4.3 (where the wealth variable being "instrumented" is the change in risky financial wealth).
Number of observations: 6370 from 3819 families.
Region dummies are also included in the regression.
Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.
F-statistics from weak identification tests are: 14.61 (column 1 including change in labour income) and 14.51 (column 2).

## *Appendix Table B4: First stage of two-stage least squares*

Dependent variable: Δ Total accessible financial wealth

| | **Including Δ Labour Income** | **No Control for Income** |
|---|---|---|
| Calculated delta fin. wealth | 0.597 ** | 0.589 ** |
| | (0.264) | (0.260) |
| Delta house value | 0.030 *** | 0.031 *** |
| | (0.010) | (0.010) |
| Delta labour income | 0.372 * | |
| | (0.210) | |
| Delta unemployment status | -1714.593 | -3076.670 |
| | (2113.257) | (1980.498) |
| Delta retirement status | -333.583 | -490.960 |
| | (5609.413) | (5718.960) |
| Delta no. of people in the HH | 83.841 | 1207.397 |
| | (1293.229) | (1051.587) |
| Delta no. of earners in the HH | -1939.678 | 803.456 |
| | (1786.020) | (1022.982) |
| Year 2010 | 3483.436 | 2684.318 |
| | (2940.037) | (2811.973) |
| Age 40 - 49 | -1323.801 | -768.114 |
| | (1702.314) | (1670.340) |
| Age 50 - 59 | 380.875 | 979.642 |
| | (1853.972) | (1815.125) |
| Age 60 - 69 | -1885.773 | -1651.922 |
| | (4330.357) | (4306.958) |
| Age 70+ | -1576.705 | -1238.721 |
| | (3218.292) | (3140.160) |
| Medium education | -721.257 | -815.443 |
| | (1916.916) | (1944.050) |
| High education | 6409.473 * | 5866.477 * |
| | (3360.398) | (3248.962) |
| Regional unemployment rate | -1813.521 | -1495.103 |
| | (1846.334) | (1772.665) |
| Male | -1471.462 | -1739.554 |
| | (1090.804) | (1167.666) |
| Retired (t-1) | 420.033 | 673.043 |
| | (2837.864) | (2896.684) |
| Public sector employee (t-1) | -2043.700 | -1956.050 |
| | (2425.498) | (2429.737) |
| Homeowner (t-1) | 1648.056 * | 1610.634 * |
| | (871.821) | (887.792) |
| Constant | 10091.711 | 7978.362 |
| | (11652.970) | (11099.158) |

**Notes to table:** These first-stage results relate to second stage results reported in Tables 4.1 and 4.2 (where the wealth variable being "instrumented" is the change in total financial wealth).
Number of observations: 6370 from 3819 families.
Region dummies are also included in the regression.
Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.
F-statistics from weak identification tests are: 5.11 (column 1 including change in labour income) and 5.13 (column 2).

## *Appendix Table B5: Full results for regressions reported in the top panel of Table 4.1*

Dependent variable: Change in household consumption expenditure

| | OLS | | IV 2nd Stage | |
|---|---|---|---|---|
| | **Including Δ Labour Income** | **No Control for Income** | **Including Δ Labour Income** | **No Control for Income** |
| **Delta risky financial wealth** | **0.016 ** (0.007)** | **0.016 ** (0.007)** | **0.088 * (0.047)** | **0.086 * (0.047)** |
| **Delta house value** | **0.004 *** (0.001)** | **0.004 *** (0.001)** | **0.003 *** (0.001)** | **0.003 *** (0.001)** |
| Delta labour income | 0.079 *** (0.020) | | 0.079 *** (0.020) | |
| Delta unemployment status | -1556.171 ** (612.166) | -1846.143 *** (616.947) | -1481.319 ** (618.512) | -1773.569 *** (623.452) |
| Delta retirement status | 425.789 (466.871) | 392.921 (471.705) | 569.728 (480.620) | 532.158 (484.088) |
| Delta no. of people in the HH | 2026.098 *** (294.384) | 2263.764 *** (292.070) | 1930.572 *** (292.252) | 2171.226 *** (292.015) |
| Delta no. of earners in the HH | 1001.949 *** (297.572) | 1583.958 *** (276.589) | 1039.473 *** (297.779) | 1619.893 *** (275.373) |
| Year 2010 | 295.468 (575.785) | 125.952 (579.205) | 224.320 (580.768) | 57.242 (583.006) |
| Age 40 - 49 | -161.135 (501.821) | -42.165 (501.724) | -45.521 (509.992) | 69.583 (509.534) |
| Age 50 - 59 | -375.272 (488.098) | -246.830 (490.212) | -266.614 (491.351) | -141.816 (492.696) |
| Age 60 - 69 | -1170.911 ** (525.759) | -1119.904 ** (528.143) | -1072.162 ** (533.083) | -1024.426 * (535.024) |
| Age 70+ | -486.734 (497.489) | -413.605 (500.200) | -364.744 (502.262) | -295.661 (504.289) |
| Medium education | -395.526 * (227.978) | -413.221 * (229.352) | -230.043 (242.037) | -253.155 (242.876) |
| High education | 5.761 (466.178) | -104.798 (476.064) | 196.508 (493.498) | 79.759 (503.352) |
| Regional unemployment rate | 160.324 (310.123) | 225.084 (311.964) | 70.671 (314.687) | 138.332 (316.214) |
| Male | 4.151 (187.095) | -51.837 (189.673) | 70.295 (189.330) | 12.172 (191.626) |
| Retired (t-1) | 123.045 (264.451) | 176.819 (266.475) | 193.063 (274.934) | 244.507 (276.276) |
| Public sector employee (t-1) | 2.732 (263.205) | 20.398 (266.594) | -27.110 (266.625) | -8.476 (269.684) |
| Homeowner (t-1) | 198.665 (209.456) | 191.718 (211.064) | 227.790 (210.334) | 219.892 (211.611) |
| Region dummies | Yes | Yes | Yes | Yes |
| Constant | -1233.575 (1757.480) | -1665.068 (1769.722) | -874.557 (1780.904) | -1317.563 (1790.618) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.

Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.

Coefficients in bold can be interpreted as mpc out of wealth change.

Detailed results from the first stage regressions for the IV models are included in Appendix Table B3; F-statistics from weak identification tests are: 14.61 (column 2 including change in labour income) and 14.51 (column 4).

## *Appendix Table B6: Full results for regressions reported in the bottom panel of Table 4.1*

Dependent variable: Change in household consumption expenditure

| | OLS | | IV 2nd Stage | |
|---|---|---|---|---|
| | **Including Δ Labour Income** | **No Control for Income** | **Including Δ Labour Income** | **No Control for Income** |
| **Delta financial wealth** | **0.002** | **0.004** | **0.100** | **0.099** |
| | **(0.003)** | **(0.003)** | **(0.070)** | **(0.071)** |
| **Delta house value** | **0.004 ***** | **0.004 ***** | **0.001** | **0.001** |
| | **(0.001)** | **(0.001)** | **(0.002)** | **(0.003)** |
| Delta labour income | 0.078 *** | | 0.042 | |
| | (0.020) | | (0.037) | |
| Delta unemployment status | -1569.980 ** | -1852.280 *** | -1427.671 ** | -1586.125 ** |
| | (610.928) | (616.057) | (659.231) | (679.909) |
| Delta retirement status | 395.724 | 364.399 | 446.971 | 428.463 |
| | (469.031) | (473.835) | (733.326) | (724.879) |
| Delta no. of people in the HH | 2045.942 *** | 2278.874 *** | 2005.018 *** | 2133.766 *** |
| | (295.844) | (293.382) | (305.885) | (311.227) |
| Delta no. of earners in the HH | 996.616 *** | 1572.502 *** | 1168.668 *** | 1479.847 *** |
| | (298.533) | (276.870) | (339.568) | (308.515) |
| Year 2010 | 305.420 | 131.868 | -30.916 | -117.272 |
| | (576.194) | (579.429) | (682.737) | (657.514) |
| Age 40 - 49 | -183.343 | -63.027 | -19.155 | 42.511 |
| | (501.452) | (501.226) | (524.039) | (518.598) |
| Age 50 - 59 | -398.458 | -272.016 | -390.774 | -321.666 |
| | (488.321) | (490.100) | (503.900) | (509.482) |
| Age 60 - 69 | -1188.404 ** | -1133.505 ** | -954.727 | -930.731 |
| | (525.747) | (527.761) | (689.408) | (678.795) |
| Age 70+ | -509.693 | -433.666 | -306.486 | -270.115 |
| | (497.815) | (500.194) | (588.860) | (578.675) |
| Medium education | -428.612 * | -442.951 * | -275.921 | -287.765 |
| | (228.634) | (229.772) | (295.551) | (295.279) |
| High education | -42.463 | -160.699 | -505.516 | -558.245 |
| | (468.235) | (477.530) | (659.186) | (639.188) |
| Regional unemployment rate | 180.764 | 246.045 | 257.430 | 291.214 |
| | (310.366) | (312.239) | (371.248) | (360.952) |
| Male | -7.218 | -58.657 | 171.405 | 138.548 |
| | (187.410) | (189.756) | (233.703) | (247.867) |
| Retired (t-1) | 107.385 | 159.417 | 66.702 | 96.285 |
| | (264.438) | (266.266) | (384.998) | (385.220) |
| Public sector employee (t-1) | 11.782 | 32.587 | 179.582 | 186.609 |
| | (263.403) | (266.759) | (387.998) | (382.571) |
| Homeowner (t-1) | 190.416 | 180.988 | 63.576 | 61.718 |
| | (209.339) | (210.899) | (244.676) | (244.192) |
| Region dummies | Yes | Yes | Yes | Yes |
| Constant | -1316.500 | -1748.618 | -1691.330 | -1918.413 |
| | (1757.985) | (1770.439) | (2155.759) | (2084.642) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.

Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.

Coefficients in bold can be interpreted as mpc out of wealth change.

Detailed results from the first stage regressions for the IV models are included in Appendix Table B4; F-statistics from weak identification tests are: 5.11 (column 2 including change in labour income) and 5.13 (column 4).

## *Appendix Table B7: Full results for regressions reported in the top panel of Table 4.2*

Dependent variable: Change in household expenditure on non-durables.

| | OLS | | IV 2nd Stage | |
|---|---|---|---|---|
| | **Including Δ Labour Income** | **No Control for Income** | **Including Δ Labour Income** | **No Control for Income** |
| **Delta risky financial wealth** | **0.016 *** (0.005)** | **0.016 *** (0.006)** | **0.057 ** (0.028)** | **0.055 * (0.029)** |
| **Delta house value** | **0.003 *** (0.001)** | **0.003 *** (0.001)** | **0.002 *** (0.001)** | **0.002 *** (0.001)** |
| Delta labour income | 0.058 *** (0.016) | | 0.058 *** (0.016) | |
| Delta unemployment status | -1165.150 *** (396.578) | -1377.210 *** (399.493) | -1123.289 *** (401.656) | -1337.046 *** (404.731) |
| Delta retirement status | -352.065 (323.674) | -376.102 (325.511) | -271.566 (324.924) | -299.045 (326.027) |
| Delta no. of people in the HH | 1784.869 *** (213.312) | 1958.676 *** (212.648) | 1731.445 *** (214.925) | 1907.463 *** (215.251) |
| Delta no. of earners in the HH | 940.634 *** (223.564) | 1366.262 *** (198.373) | 961.619 *** (223.897) | 1386.149 *** (198.489) |
| Year 2010 | 222.021 (412.706) | 98.052 (416.229) | 182.231 (413.681) | 60.027 (416.880) |
| Age 40 - 49 | 183.514 (343.934) | 270.518 (344.675) | 248.173 (348.224) | 332.362 (348.701) |
| Age 50 - 59 | 122.799 (333.565) | 216.729 (334.925) | 183.567 (337.172) | 274.847 (338.412) |
| Age 60 - 69 | -611.289* (359.123) | -573.987 (359.881) | -556.063 (364.096) | -521.148 (364.838) |
| Age 70+ | -3.110 (351.374) | 50.370 (353.292) | 65.114 (355.196) | 115.642 (357.082) |
| Medium education | -272.787 (167.019) | -285.728 * (168.160) | -180.239 (176.888) | -197.144 (178.798) |
| High education | -69.782 (403.329) | -150.635 (408.166) | 36.895 (413.807) | -48.498 (419.285) |
| Regional unemployment rate | 236.447 (216.548) | 283.807 (219.045) | 186.308 (219.213) | 235.797 (221.485) |
| Male | 144.589 (136.186) | 103.644 (138.519) | 181.580 (138.143) | 139.068 (140.533) |
| Retired (t-1) | -27.285 (193.719) | 12.040 (195.035) | 11.873 (198.730) | 49.500 (199.634) |
| Public sector employee (t-1) | 242.022 (192.013) | 254.941 (194.051) | 225.333 (192.235) | 238.962 (194.169) |
| Homeowner (t-1) | 289.372 * (153.345) | 284.292 * (155.092) | 305.660 ** (153.536) | 299.884 * (155.075) |
| Region dummies | Yes | Yes | Yes | Yes |
| Constant | -1855.587 (1224.313) | -2171.142 * (1239.657) | -1654.803 (1236.205) | -1978.826 (1249.708) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.
Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.
Coefficients in bold can be interpreted as mpc out of wealth change.
Detailed results from the first stage regressions for the IV models are included in Appendix Table B3; F-statistics from weak identification tests are: 14.61 (column 2 including change in labour income) and 14.51 (column 4).

## *Appendix Table B8: Full results for regressions reported in the bottom panel of Table 4.2*

Dependent variable: Change in household expenditure on non-durables.

| | OLS | | IV 2nd Stage | |
|---|---|---|---|---|
| | **Including Δ Labour Income** | **No Control for Income** | **Including Δ Labour Income** | **No Control for Income** |
| **Delta financial wealth** | **0.003** | **0.005 **** | **0.062 *** | **0.061** |
| | **(0.002)** | **(0.002)** | **(0.036)** | **(0.037)** |
| **Delta house value** | **0.003 ***** | **0.003 ***** | **0.001** | **0.001** |
| | **(0.001)** | **(0.001)** | **(0.001)** | **(0.001)** |
| Delta labour income | 0.057 *** | | 0.035 | |
| | (0.016) | | (0.022) | |
| Delta unemployment status | -1177.262 *** | -1380.942 *** | -1092.602 ** | -1224.290 *** |
| | (395.310) | (398.558) | (429.604) | (439.629) |
| Delta retirement status | -382.644 | -405.245 | -352.157 | -367.538 |
| | (326.928) | (328.934) | (481.610) | (473.220) |
| Delta no. of people in the HH | 1804.936 *** | 1972.997 *** | 1780.590 *** | 1887.590 *** |
| | (213.672) | (213.050) | (222.560) | (226.206) |
| Delta no. of earners in the HH | 937.863 *** | 1353.366 *** | 1040.217 *** | 1298.831 *** |
| | (223.419) | (198.625) | (240.356) | (206.872) |
| Year 2010 | 226.944 | 101.726 | 26.857 | -44.912 |
| | (412.649) | (415.868) | (455.016) | (445.911) |
| Age 40 - 49 | 162.985 | 249.793 | 260.660 | 311.910 |
| | (343.488) | (344.321) | (358.345) | (357.159) |
| Age 50 - 59 | 98.699 | 189.927 | 103.271 | 160.704 |
| | (333.500) | (334.835) | (346.746) | (347.991) |
| Age 60 - 69 | -625.762 * | -586.152 | -486.747 | -466.804 |
| | (358.873) | (359.489) | (452.627) | (446.136) |
| Age 70+ | -23.790 | 31.064 | 97.098 | 127.326 |
| | (351.182) | (353.013) | (404.145) | (399.064) |
| Medium education | -304.870 * | -315.216 * | -214.034 | -223.877 |
| | (167.472) | (168.335) | (203.187) | (203.012) |
| High education | -127.705 | -213.012 | -403.177 | -446.999 |
| | (404.240) | (409.117) | (479.710) | (473.066) |
| Regional unemployment rate | 259.051 | 306.152 | 304.661 | 332.737 |
| | (216.690) | (219.084) | (244.007) | (240.080) |
| Male | 135.619 | 98.505 | 241.882 | 214.575 |
| | (136.120) | (138.241) | (159.303) | (167.029) |
| Retired (t-1) | -44.310 | -6.768 | -68.511 | -43.926 |
| | (193.741) | (194.831) | (257.788) | (257.187) |
| Public sector employee (t-1) | 254.209 | 269.220 | 354.034 | 359.873 |
| | (192.961) | (194.936) | (253.385) | (250.357) |
| Homeowner (t-1) | 278.689 * | 271.886 * | 203.232 | 201.687 |
| | (153.298) | (155.014) | (169.902) | (170.456) |
| Region dummies | Yes | Yes | Yes | Yes |
| Constant | -1948.330 | -2260.104 * | -2171.317 | -2360.042 * |
| | (1224.689) | (1239.576) | (1416.872) | (1386.649) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.
Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.
Coefficients in bold can be interpreted as mpc out of wealth change.
Detailed results from the first stage regressions for the IV models are included in Appendix Table B4; F-statistics from weak identification tests are: 5.11 (column 2 including change in labour income) and 5.13 (column 4).

## *Appendix Table B9: Full results for regressions reported in Table 4.3*

| Dependent variable: | *Δ Total C* (a1) | (a2) | *Δ Non-durable C* (b1) | (b2) | *Δ Durables expenditures* (c1) | (c2) | *Δ Food expenditure* (d1) | (d2) |
|---|---|---|---|---|---|---|---|---|
| **Delta risky financial wealth** | **0.088 *** **(0.047)** | **0.086 *** **(0.047)** | **0.057 ** **(0.028)** | **0.055 *** **(0.029)** | **0.031 (0.041)** | **0.031 (0.040)** | **0.015 *** **(0.008)** | **0.015 *** **(0.008)** |
| **Delta house value** | **0.003 *** **(0.001)** | **0.003 *** **(0.001)** | **0.002 *** **(0.001)** | **0.002 *** **(0.001)** | **0.001 (0.001)** | **0.001 (0.001)** | **0.000 (0.000)** | **0.000 (0.000)** |
| Delta labour income | 0.079 *** (0.020) | | 0.058 *** (0.016) | | 0.021 *** (0.008) | | 0.009 ** (0.004) | |
| Delta unemployment status | -1481.319 ** (618.512) | -1773.569 *** (623.452) | -1123.289 *** (401.656) | -1337.046 *** (404.731) | -358.030 (462.310) | -436.523 (462.777) | -209.005 (183.093) | -243.517 (183.091) |
| Delta retirement status | 569.728 (480.620) | 532.158 (484.088) | -271.566 (324.924) | -299.045 (326.027) | 841.294 ** (367.328) | 831.204 ** (368.194) | -117.269 (174.683) | -121.706 (174.288) |
| Delta no. of people in the HH | 1930.572 *** (292.252) | 2171.226 *** (292.015) | 1731.445 *** (214.925) | 1907.463 *** (215.251) | 199.127 (193.044) | 263.763 (191.205) | 971.090 *** (101.054) | 999.509 *** (100.635) |
| Delta no. of earners in the HH | 1039.473 *** (297.779) | 1619.893 *** (275.373) | 961.619 *** (223.897) | 1386.149 *** (198.489) | 77.854 (203.553) | 233.744 (206.509) | 225.739 ** (91.141) | 294.280 *** (88.480) |
| Year 2010 | 224.320 (580.768) | 57.242 (583.006) | 182.231 (413.681) | 60.027 (416.880) | 42.089 (408.083) | -2.785 (407.970) | 818.169 *** (178.065) | 798.439 *** (177.679) |
| Age 40 - 49 | -45.521 (509.992) | 69.583 (509.534) | 248.173 (348.224) | 332.362 (348.701) | -293.694 (376.033) | -262.779 (375.903) | -234.801 * (131.555) | -221.208 * (131.431) |
| Age 50 - 59 | -266.614 (491.351) | -141.816 (492.696) | 183.567 (337.172) | 274.847 (338.412) | -450.181 (364.453) | -416.662 (364.787) | -334.795 *** (129.529) | -320.058 ** (129.507) |
| Age 60 - 69 | -1072.162** (533.083) | -1024.426 * (535.024) | -556.063 (364.096) | -521.148 (364.838) | -516.099 (403.132) | -503.278 (403.394) | -427.830 *** (150.248) | -422.193 *** (149.960) |
| Age 70+ | -364.744 (502.262) | -295.661 (504.289) | 65.114 (355.196) | 115.642 (357.082) | -429.858 (371.172) | -411.303 (371.049) | -360.494 ** (140.540) | -352.336 ** (140.555) |
| Medium education | -230.043 (242.037) | -253.155 (242.876) | -180.239 (176.888) | -197.144 (178.798) | -49.803 (173.796) | -56.011 (173.428) | -150.156 ** (72.820) | -152.885 ** (73.038) |
| High education | 196.508 (493.498) | 79.759 (503.352) | 36.895 (413.807) | -48.498 (419.285) | 159.613 (305.937) | 128.257 (308.428) | -367.525 ** (159.206) | -381.312 ** (159.245) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Regional unemployment rate | 70.671 | 138.332 | 186.308 | 235.797 | -115.637 | -97.464 | -365.621 *** | -357.631 *** |
| | (314.687) | (316.214) | (219.213) | (221.485) | (220.921) | (220.754) | (91.909) | (91.693) |
| Male | 70.295 | 12.172 | 181.580 | 139.068 | -111.286 | -126.896 | -42.829 | -49.693 |
| | (189.330) | (191.626) | (138.143) | (140.533) | (134.885) | (134.884) | (58.244) | (58.227) |
| Retired (t-1) | 193.063 | 244.507 | 11.873 | 49.500 | 181.190 | 195.007 | 28.906 | 34.981 |
| | (274.934) | (276.276) | (198.730) | (199.634) | (198.989) | (199.575) | (93.649) | (93.622) |
| Public sector employee (t-1) | -27.110 | -8.476 | 225.333 | 238.962 | -252.443 | -247.438 | 33.868 | 36.069 |
| | (266.625) | (269.684) | (192.235) | (194.169) | (189.575) | (190.001) | (79.650) | (79.801) |
| Homeowner (t-1) | 227.790 | 219.892 | 305.660 ** | 299.884 * | -77.871 | -79.992 | 50.167 | 49.234 |
| | (210.334) | (211.611) | (153.536) | (155.075) | (136.246) | (136.144) | (65.908) | (66.150) |
| Region dum.s | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | -874.557 | -1317.563 | -1654.803 | -1978.826 | 780.246 | 661.262 | 2396.792 *** | 2344.478 *** |
| | (1780.904) | (1790.618) | (1236.205) | (1249.708) | (1269.021) | (1268.633) | (515.582) | (514.511) |

**Notes to table:** Number of observations: 6370 observations from 3867 families.
Significance: * p<0.1, **p<0.05, *** p<0.001. Standard errors in parenthesis are robust to heteroskedasticity and to correlation within the household.
Coefficients in bold can be interpreted as mpc out of wealth change.
Detailed results from the first stage regressions for the IV models are included in Appendix Table B3; F-statistics from weak identification tests are: 14.61 (including change in labour income) and 14.51 (no control for change in labour income).

## *Appendix Table B10: Percent owning risky assets by age-band*

| Age band | Less than 50 | 50-69 | 70 and above | Sample size |
|---|---|---|---|---|
| **Percentage that own risky assets** | 15.2% | 16.9% | 10.2% | 6370 |

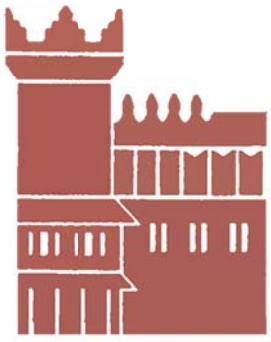
Notes to Table: Ownership of risky assets is defined in terms of having a non-zero value for our excluded instrument, so is measured in 2004 or 2006.

## *Appendix Table B11:*

## *Percent becoming pessimistic and with a mortgage, by ownership of risky assets*

| Sample | All | Those owning risky assets | Sample size |
|---|---|---|---|
| **Become pessimistic** | 12.3% | 23.3% | 3327 |
| **Have mortgage** | 11.1% | 14.5% | 5536 |

Notes to Table: Ownership of risky assets is defined in terms of having a non-zero value for our excluded instrument, so is measured in 2004 or 2006. Sample sizes are for the regressions reported, respectively, in Tables 4.6 and 4.7.



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