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Labour Supply Responses to Financial Wealth Shocks: Evidence from in Italy*

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Abstract

We look at how strongly shocks to asset values affect labour supply, using Italian data. We use asset price shocks to provide a measure of wealth changes that is exogenous to households' saving and labour supply. Our results point to significant effects of wealth on hours of work and on whether or not agents leave their jobs. The magnitude of these effects can be substantial, for example for those individuals who suffered larger wealth losses during the financial crisis. Family effects reflect similar responses from men and women on average. Older working-age individuals drive the population results.

Keywords: Labour Supply; Financial wealth shocks; Wealth effects.

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1. Introduction

When faced with wealth shocks, do individuals adjust their labour supply? In a world in which modifications to pension systems, and increasing longevity, are encouraging individuals to accumulate private wealth, such questions are increasingly pertinent. Shocks to financial wealth during the post 2007 financial crisis also throw this question in to sharper focus.

We aim to provide evidence on this issue using Italian data. We focus on changes in financial wealth, and use shocks to asset prices (particularly in 2007-2008) to provide a source of (exogenous) variation. Our results point to noticeable effects on the labour supply behaviour of those who suffered larger shocks.

We are not the first researchers to look labour supply responses to wealth. Coile and Levine (2011) find evidence that households in the US of around retirement age responded in their labour supply to the recent stock market crash, but this effect did not fully offset the effects of unemployment on these older workers. Using a related methodology for the UK, Disney, Radcliffe and Smith (2015) find little evidence of wealth effects on labour supply in the UK. Using different empirical variation, Disney and Gathergood (2017, forthcoming), find significant effects of house price shocks on the labour supply of younger individuals and older men.

The rest of the paper is organised as follows: section 2 describes the data that we exploit; section 3 details our empirical method; section 4 presents and discusses results, and section 5 concludes.

2. Data

The Survey on Household Income and Wealth (SHIW) is a representative sample of the Italian resident population. 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[1] in around 300 municipalities. There is a panel component to the survey sample: about 50% of households in a given year are interviewed in the

[1] A household is a group of individuals related by blood, marriage or adoption and sharing the same dwelling.

following wave.

The survey records a rich set of household and person characteristics as well as information on incomes and savings, and on household labour supply 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 labour supply and wealth between 2006 and 2008, and between 2008 and 2010. The information from 2004 (and 2006 and 2008) is used as required to construct lagged variables. The variation provided by the period of the large adjustment to financial asset values in 2007-08, is helpful for our empirical method.

We now describe the SHIW labour supply and wealth variables that we exploit.

SHIW labour supply variables. The SHIW dataset provides detailed information on labour supply, incuding regarding whether or not agents work, and about hours of work, potentially across multiple jobs. There is also information on sector and industry of employment, and on whether individuals are self-employed or work as employees. Our main dependent variables use information on whether or not agents have work, and on hours of work.

Descriptive statistics for these variables in our sample, and for households with and without risky assets, are provided in Table 2.1. In the table, hours of work are annual hours worked by an individual, and change in hours of work are the difference in annual hours worked between the current survey year and the previous one. Being in work is defined as having any paid job in the survey year, and those recorded as leaving work are individuals who are not in work in the current survey year but were in work in the previous one.

Table 2.1: Descriptive Statistics, Labour Supply

	Mean	Median	N
Hours of Work			
All	973.1	960	7143
2008	970.9	864	3526
2010	975.2	960	3617
HH with risky assets	1136	1440	1208
2008	1107.7	1440	602
2010	1164.4	1440	606
Change in Hours of Work			
All	-65.57	0	7143
2008	-52.51	0	3526
2010	-78.29	0	3617
HH with risky assets	-87.38	0	1208
2008	-82.39	0	602
2010	-92.34	0	606
Work			
All	0.5461	1	7143
2008	0.5383	1	3526
2010	0.5538	1	3617
HH with risky assets	0.6358	1	1208
2008	0.6262	1	602
2010	0.6452	1	606
Leave Work			
All	0.05488	0	7143
2008	0.05729	0	3526
2010	0.05253	0	3617
HH with risky assets	0.04967	0	1208
2008	0.04817	0	602
2010	0.05116	0	606

SHIW financial wealth variables. The SHIW dataset collects detailed information on household portfolios. Respondents are asked about ownership of, and about amounts of wealth held in, each of many types of 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; and, other minor categories. Within each broad category 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 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").[2] 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.[3]

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 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 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 information on the variables included in our regressions and panel information (for a subset of variables) for three consecutive waves (to have a difference and lagged information), and we select individuals between ages 25 and 69. In households with more than one member, we keep the household head and his or her spouse.[4] We end up with a sample of around 7000 person-year observations.

3. Methodology

It is familiar that forward-looking models suggest that when faced with unexpected changes (or "shocks") to lifetime resources, households should adjust their consumption and saving behaviour. Further, such models of "smoothing" would suggest that households should adjust on other margins too, including through their choices over leisure and labour-supply. We aim to understand whether, and how strongly, wealth shocks affect labour

[2] 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).
[3] 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.
[4] We also perform our analysis including other adult household members. Details are available on request.

supply decisions. To investigate this we will look to relate changes (first-differences) in labours supply choices, to changes in the value of (financial) wealth:

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

Where: h and t indicate household and time period; l is a labour supply choice; w is the relevant measure of wealth; α and ω are coefficients and ε is an error term; and, Δ indicates "first difference" so that $\Delta l_{ht} = l_{ht} - l_{h(t-1)}$, with differences of other variables defined analogously.

Simply implementing equation (1) empirically by relating changes in labour supply to contemporaneous changes in wealth, is unlikely to provide a value of ω that can be interpreted as an unbiased estimate of the effect of wealth changes on labour supply. The complication is one of endogeneity arising from the fact that one way to increase wealth is to work more in order to earn more income. That is, an agent who works (and so earns) more will increase wealth more than an otherwise similar agent who works less. This will generate a positive correlation between wealth changes and labour supply changes, even if (or when) the wealth changes are not causing adjustments to labour supply. Failure to account for this would thus lead to an upwards bias in the estimated coefficient.

We apply a method of dealing with this endogeneity that has been used in the consumption literature[5], and regress the change in labour supply on the "passive" part of the change in wealth. The "passive" part of the change in wealth is the part that comes from capital gains and changes in asset values, rather than the part that is generated by choices about how much to earn, spend and save.

To arrive at a value for the passive part of the change in wealth, we take a fixed wealth portfolio for each household, and calculate 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 portfolio is the amounts of assets held in 2006. The household might (for example) have a

[5] The insight dates back at least to Dynan and Maki (2001).

certain amount of cash deposits, domestically held shares, and domestically held bonds.[6] 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.

In the previous paragraph, we described a calculation of the passive change in wealth for *(t-1)* to *(t)*, as based on the fixed portfolio from *(t-1)*. In fact in our empirical work we use portfolio information from *(t-2)*. That is, when we are dealing with changes in wealth (and labour supply) between 2008 and 2010, the portfolio information comes from 2006; portfolio information from 2004 is used when dealing with changes between 2006 and 2008. Taking a second lag ensures that the portfolio measure is not affected by measurement error from a survey period used in constructing differences of wealth (and labour supply) outcomes. In particular, in this way the portfolio measure will not be contaminated by the same measurement error that affects our measure of changes in observed wealth. We use Δw_t^{fp} to denote our calculated value of the passive part of the change in wealth, and this is the calculated change in the value of the fixed portfolio from *(t-2)*.

A key part of our empirical strategy is to replace Δw_{ht} with Δw_{ht}^{fp} when estimating the relationship between labour supply outcomes and wealth changes described in equation (1). Aside from the endogeneity discussed above, another threat to clean identification could be an omitted variables problem if other factors that affect labour supply (on average) are also correlated with the asset price shock. In this regard a powerful advantage of the first-differenced specification is that it conditions out any household fixed effect. To further mitigate this potential problem we exploit the richness of our dataset and extend the specification (1) to include an "$\boldsymbol{X}$" vector of covariates. We include a rich set of covariates, the details of which are discussed when we present results in the next section.

Given the issues discussed above, the equation to be estimated becomes:

$$\Delta l_{ht} = \alpha + \omega \, \Delta w_{ht}^{fp} + \boldsymbol{X'_{ht}\beta} + \varepsilon_{ht} \qquad (2)$$

[6] 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 of Bottazzi, Trucchi and Wakefield (2017).

note that the labels on some coefficients, and for the error term, are the same in equations (1) and (2): this is for convenience and should not be taken as implying that estimating of the two equations would yield the same results.

For equation (2) to accurately measure the relationship of interest, we would need that the change in the value of the fixed portfolio accurately captures the "passive" part of the change in wealth. It is possible that the measure is not entirely accurate: our observations come at two year intervals and in the period between observations households might take actions that adjust their exposure to asset price changes. If this means that the "passive" effect of changes in asset values on wealth is actually smaller than the values we calculate, then estimation of (2) would yield an underestimate of the size of the effect of wealth changes on labour supply. Even if our calculated variable does not capture "passive" changes in wealth entirely accurately, it can be expected to be correlated with actual changes in wealth and is unaffected by active saving decisions and thus unaffected by the influence of labour supply on wealth that we described above. Thus the calculated change in wealth is the ideal "excluded variable" to construct an instrument for actual changes in wealth. This leads us to the following instrumental variables (IV) estimator:

$$\Delta l_{ht} = \alpha^{IV} + \omega^{IV} \widehat{\Delta w_{ht}} + \boldsymbol{X'_{ht}}\boldsymbol{\beta^{IV}} + \varepsilon_{ht}^{IV} \qquad (3)$$

where: $\widehat{\Delta w_{ht}}$ is the predicted change in the relevant measure of wealth based on the following first-stage equation for the observed (reported) change in the value of a household's financial wealth (Δw_{ht}):

$$\Delta w_{ht} = \gamma + \varphi \, \Delta w_{ht}^{fp} + \boldsymbol{X'_{ht}}\boldsymbol{\delta} + \mu_{ht} \qquad (4)$$

In our empirical results in the next section, we present estimates of ω from both equations (2) and (3); equation (2) is the reduced form of the IV estimator described by equations (3) and (4). When it comes to implementing the IV model, it is particularly important that the observed fixed portfolio is free from any measurement error that also affects the observed value of the change in wealth, and this further justifies the decision to lag two survey periods for the portfolio measure.[7]

[7] The method of using lags is relatively standard for dealing with endogeneity in differenced panel data models, and 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).

Our aim is to estimate the effect of unexpected changes in wealth on individuals' labour supply choices. Given the nature of the crucial "Δw_{ht}^{fp}" variable, the key exogenous variation in wealth that we are exploiting 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 2007-2008 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 the large change in asset prices in 2007-2008 is important for providing us with variation that is both substantial and exogenous. The idea of using asset price changes as a source of plausibly exogenous variation in wealth has been exploited by researchers in other contexts. To investigate the effect of wealth on consumption, Banks et al (2012) propose an IV strategy similar to that described above and apply it for a sample of older English households; in Bottazzi, Trucchi and Wakefield (2013, 2017) we follow a similar approach with representative data for Italy. Banks et al (2012) also look at other outcomes, notably expectational outcomes. Crawford (2013) finds little effect of wealth shocks on the retirement plans of older people in the England. Schwandt (2017) also exploits variation from asset price changes and finds some effects of wealth shocks on the health among a sample of older Americans.

An important part of the research methodology just described, is the construction of changes in calculated wealth. The work to do this, which is more fully described in Bottazzi, Trucchi and Wakefield (2017), is data and labour intensive, but allows us to arrive at a measure of changes in wealth that is exogenous to households' saving and labour supply behaviour. Descriptive statistic for the constructed variable are provided in Table 3.1. Details on the comparison between actual (reported) and calculated changes are also provided in Bottazzi, Trucchi and Wakefield (2017).

Table 3.1: Descriptive Statistics, Change in Calculated Risky Financial Wealth

	Mean	Median	N
Change in calculated risky fin. wealth			
All	- 1289	0	7143
2008	- 2720	0	3526
2010	105	0	3617
Change in calculated risky fin. wealth (owners of risky wealth only)			
All	- 7624	2	1208
2008	- 15930	- 8061	602
2010	627	221	606

4. Empirical Results

In subsection 4.1 we present baseline specifications for our full sample, and we discuss various robustness analyses in subsection 4.2. Subsection 4.3 presents analyses for an older subsample and the results in subsection 4.4 are for labour supply outcomes measured at the family (rather than the individual) level.

4.1 Baseline results

We present results for the estimators described in the previous section, for two labour supply outcomes intended to capture intensive margin and extensive margin decisions. For the intensive margin, the outcome variable is the change in the annual number of hours worked; Table 4.1 presents results for our baseline sample for this outcome. For the extensive margin the outcome variable is an indicator of whether the agent left work during the two-year period between SHIW surveys; Table 4.2 presents baseline results for this outcome.

Both Tables 4.1 and 4.2 present results from four regressions. The difference between the first and second pair of regressions is that the latter contain a flexible set of indicator variables to capture effects on labour supply behaviour of years of contributions to Italy's public pension (or social security) system. Across all the results that are presented, the parameter on the main coefficient of interest (the change in wealth) is displayed in bold in the first row of the table. The wealth variable that we use is the change in the value of risky wealth, which is wealth that has some exposure to stock-market risk (either because the wealth is directly held in stocks, or because it is wealth held in a wrapper product such as a mutual fund, that includes some exposure to the stock market). This is wealth that was

particularly exposed to the stock market fluctuations of 2007-2008 that provide us with a key source of variation. Before we comment further on the results for this main variable of interest, we briefly discuss some of the other covariates that are included in the regressions.

Our regression strategy effectively compares the labour supply outcomes for those with larger changes in (shocks to) wealth, to outcomes for those with smaller changes. To identify effects of wealth shocks we need that, in the absence of the shocks, changes in labour supply outcomes would, conditional on other regressors, have been similar across those that do or do not suffer shocks. As mentioned in the previous section, including a rich set of covariates can therefore help with identification, as well as making results more precise. The results in Tables 4.1 and 4.2 display the covariates that we included.

As already noted, the difference between the first and second pairs of regressions in each of Tables 4.1 and 4.2, is the inclusion of a set of indicators regarding years of contributions to the public pension system. It would seem important to include such indicators since labour supply decisions are likely to be affect by public sector pension accrual, at least near to retirement age. The indicators that we include are intended to flexibly capture the difference between individuals who have few years of contributions and so are far from being eligible for a generous pension, and individuals who have larger numbers of years of contributions and so are close to receiving a generous pension. As such we use indicators for groups of years of contributions that are particularly narrow once years of contributions are 30 or more, and we also interact these with an indicator for being a public-sector employee since public and private sectors have, at times, been treated differently. Comparison of the pairs of regressions in Table 4.1, and in Table 4.2, shows that the inclusion of the years of contributions indicators does not materially affect our estimates of our main coefficients of interest.

Another regressor that might be important in explaining labour market choices is the level of household wealth. Being wealthier might, all else equal, encourage reduced labour supply (an income effect), and is also correlated with exposure to risky assets.[8] To account for this, we include indicators of having zero financial wealth and of wealth decile group

[8] In our data around 14% of agents have exposure to risky financial wealth, but this proportion is almost 40% among the decile group with the most financial wealth. This also means that average reported losses in wealth at the time of the financial crisis are much larger in the wealthiest group than in the whole sample.

(where deciles are taken across those with positive wealth in the regression sample) in all our regressions. These decile groups are based on the value of total financial wealth, lagged by two survey periods (i.e. four years). Using total financial wealth means that the wealth groups are not based on the same wealth used to construct our main variable of interest, and lagging by two periods ensures the measure of wealth is not taken from the same survey of the differenced outcome variable for the regression. Results show that the wealth indicators matter in the change in hours regression, with those in lower groups having larger increases in hours (conditional on other regressors). The indicators are less significant in the "leave work" regressions.[9]

To account for the most important sources of household wealth, we have also considered controlling for real (usually housing) wealth. We have experimented with adding an indicator for (lagged) home-ownership, and also with controlling for the (reported) change in house value, alongside our main wealth variables. We found that neither addition noticeably affected our main results, and the effect of the latter exercise on our main coefficients of interest is reported in Appendix Tables A.4.1(a) and A.4.2. We usually stick to reporting parsimonious specifications without the housing variables.

A few of the other regressors are consistently statistically significant across different regressions. More educated individuals show more positive changes in hours, and are less likely to leave work. Since our sample starts at age 25, we are observing these individuals as they progress up the career path. Being male is negatively associated with the change in hours, and increases the likelihood of leaving work, but these patterns are both consistent with men participating more and working longer hours, and so having greater scope to reduce hours and leave work. The sector of employment dummies (public sector employee and self-employed), both have positive and significant coefficients in the leave work regressions, but the "public sector employee" dummy must be carefully interpreted once years of contributions indicators are included, since the contributions indicators are interacted with the public-sector variable.

[9] For comparison, regression Table A.4.1(a) reports regression results without the wealth group dummies, alongside our main results.

Table 4.1: Baseline Results for "Change in Hours of Work"

Dependent Variable: Change in Hours of Work				
	OLS	IV	OLS	IV
Δ risky financial wealth	**-2.233***	**-2.854***	**-2.102***	**-2.673***
	(1.169)	(1.605)	(1.197)	(1.617)
Couple	8.851	7.595	11.87	10.33
	(17.42)	(17.62)	(18.06)	(18.27)
Δ no. of people in HH	15.67	17.25	19.42	20.85
	(17.92)	(18.02)	(18.18)	(18.25)
Male	-91.43***	-91.39***	-67.79***	-67.75***
	(12.88)	(12.95)	(14.76)	(14.81)
High-school education	13.10	11.50	8.144	6.636
	(14.90)	(15.00)	(15.15)	(15.24)
Post-school education	57.12**	56.31**	45.77**	44.73*
	(23.01)	(23.39)	(22.97)	(23.39)
Regional unemployment rate	8.081*	9.625**	4.797	6.269
	(4.668)	(4.787)	(4.645)	(4.771)
Year 2010	-33.12*	-32.35*	-25.64	-24.77
	(18.66)	(18.74)	(18.61)	(18.70)
Central Italy	-3.580	0.344	-7.994	-4.291
	(18.01)	(18.37)	(18.03)	(18.39)
Southern Italy	-54.94	-62.81*	-44.06	-51.54
	(36.47)	(37.03)	(35.79)	(36.36)
Public sector employee	-24.87	-24.05	-282.0*	28.14
	(19.67)	(19.83)	(146.0)	(26.98)
Self employed	-47.51	-48.21	-41.99	-42.66
	(32.11)	(32.23)	(33.22)	(33.29)
Total wealth (lagged): negative or zero	56.02	54.10	54.16	52.29
	(36.66)	(36.51)	(37.13)	(36.90)
Total wealth (lagged): I decile	112.7**	111.4**	105.2**	104.0**
	(37.58)	(37.53)	(37.96)	(37.85)
Total wealth (lagged): II decile	107.9**	106.6**	98.87**	97.63**
	(37.96)	(37.88)	(38.14)	(38.02)
Total wealth (lagged): III decile	110.4**	108.7**	103.6**	101.8**
	(37.69)	(37.59)	(38.19)	(38.02)
Total wealth (lagged): IV decile	86.65**	85.35**	78.43**	77.05**
	(38.24)	(38.20)	(38.39)	(38.28)
Total wealth (lagged): V decile	118.1**	115.0**	113.5**	110.7**
	(38.42)	(38.05)	(38.74)	(38.36)
Total wealth (lagged): VI decile	71.47**	71.15**	79.51**	79.34**
	(35.91)	(36.02)	(35.94)	(36.04)
Total wealth (lagged): VII decile	90.10**	91.70**	93.64**	95.27**
	(36.46)	(36.84)	(36.85)	(37.22)
Total wealth (lagged): VIII decile	80.27**	78.87**	77.29**	76.07**
	(36.22)	(36.50)	(36.37)	(36.63)
Total wealth (lagged): IX decile	60.44	56.66	56.69	52.71
	(37.35)	(36.93)	(37.91)	(37.34)
5-year age dummies	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
Constant	-129.9**	-137.5**	-112.5**	-109.5**
	(44.26)	(46.20)	(52.15)	(47.19)
N	7143	7143	6894	6894

Note: In all Tables: *: significant at 10% level; **: significant at 5% level; ***: significant at 1% level.
Details of the first-stage for the first IV regression in this Table (and in Table 4.2), are reported in Appendix Table A.4.1(b).

Table 4.2: Baseline Results for "Leave Work"

Dependent Variable: Leave Work				
	OLS	IV	OLS	IV
Δ risky financial wealth	**0.000634****	**0.000810****	**0.000523***	**0.000665***
	(0.000260)	(0.000403)	(0.000269)	(0.000394)
Couple	0.000467	0.000823	-0.000152	0.000230
	(0.00754)	(0.00754)	(0.00768)	(0.00768)
Δ no. of people in HH	0.00166	0.00122	0.0000935	-0.000261
	(0.00751)	(0.00751)	(0.00761)	(0.00761)
Male	0.0183***	0.0183***	0.00858	0.00857
	(0.00538)	(0.00540)	(0.00571)	(0.00572)
High-school education	-0.0131**	-0.0127**	-0.00854	-0.00816
	(0.00611)	(0.00613)	(0.00603)	(0.00605)
Post-school education	-0.0288**	-0.0286**	-0.0185**	-0.0182**
	(0.00921)	(0.00933)	(0.00902)	(0.00912)
Regional unemployment rate	-0.00173	-0.00217	-0.00133	-0.00170
	(0.00208)	(0.00211)	(0.00203)	(0.00206)
Year 2010	-0.00352	-0.00374	-0.00644	-0.00665
	(0.00673)	(0.00676)	(0.00658)	(0.00660)
Central Italy	0.000703	-0.000410	0.000697	-0.000224
	(0.00723)	(0.00728)	(0.00719)	(0.00723)
Southern Italy	0.0207	0.0230	0.0194	0.0213
	(0.0168)	(0.0170)	(0.0162)	(0.0164)
Public sector employee	0.0482***	0.0480***	0.198**	0.0248**
	(0.00916)	(0.00918)	(0.0697)	(0.0106)
Self employed	0.0307**	0.0309**	0.0261**	0.0263**
	(0.00982)	(0.00990)	(0.00992)	(0.00997)
Total wealth (lagged): negative or zero	0.0118	0.0124	0.0179	0.0183
	(0.0150)	(0.0149)	(0.0149)	(0.0148)
Total wealth (lagged): I decile	-0.0193	-0.0189	-0.0118	-0.0115
	(0.0139)	(0.0139)	(0.0139)	(0.0139)
Total wealth (lagged): II decile	-0.0157	-0.0153	-0.00562	-0.00531
	(0.0140)	(0.0140)	(0.0141)	(0.0140)
Total wealth (lagged): III decile	-0.0196	-0.0191	-0.00984	-0.00940
	(0.0136)	(0.0136)	(0.0138)	(0.0137)
Total wealth (lagged): IV decile	-0.0244*	-0.0241*	-0.0157	-0.0153
	(0.0134)	(0.0134)	(0.0134)	(0.0133)
Total wealth (lagged): V decile	-0.00799	-0.00710	-0.00212	-0.00144
	(0.0144)	(0.0143)	(0.0142)	(0.0141)
Total wealth (lagged): VI decile	-0.0109	-0.0108	-0.00583	-0.00579
	(0.0137)	(0.0137)	(0.0137)	(0.0137)
Total wealth (lagged): VII decile	-0.0172	-0.0176	-0.0135	-0.0139
	(0.0136)	(0.0137)	(0.0136)	(0.0137)
Total wealth (lagged): VIII decile	-0.00128	-0.000883	0.00185	0.00216
	(0.0143)	(0.0142)	(0.0140)	(0.0139)
Total wealth (lagged): IX decile	-0.0136	-0.0125	-0.00769	-0.00669
	(0.0136)	(0.0135)	(0.0137)	(0.0136)
5-year age dummies	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
Constant	0.0426**	0.0448**	0.0299*	0.0349*
	(0.0171)	(0.0175)	(0.0180)	(0.0180)
N	7143	7143	6894	6894

We turn to results for the main coefficient of interest, that on the change in the value of risky financial wealth. In all our results, the change in wealth variable is expressed in thousands of (2010) euros, so coefficients can be interpreted as effects per 1000 euro of change in risky financial wealth. In Table 4.1, the coefficient is remarkably stable at between -2.2 and -3, and is always significantly different from 0 at the 10% level. Given the nature of the variable, this can be interpreted as indicating that for every 1000 euro of increase in wealth, annual hours decrease by, on average, 2 or 3 hours per year. To assess whether this effect is substantial, one needs to set the coefficient in the context of actual changes in wealth.

Our data span the 2007 – 08 stock market crash and, as described in section 2, the average (calculated) change in risky financial wealth in our sample is a loss of around 1300 euros. Our estimated coefficients suggest that an agent who suffered a loss in wealth of this magnitude would increase their labour supply by between 2.7 and 3.7 hours per year.[10] This average loss in wealth comes across the 2006 – 2008 sample, a period of substantial stock market losses, and the 2008 – 2010 sample during which asset values were much more stable. Considering the earlier period in isolation, average wealth losses are slightly more than 2700 euros, and our estimates indicate that an individual suffering such a loss in wealth would increase their labour supply by between 5.7 and 7.8 hours per year. The values considered so far take averages across those with and without exposure to stock market risk. For those with stock wealth, the average change in the value of risky wealth across the sample period is approximately 7600 euro; for the 2006 – 2008 subsample the median loss is approximately 8000 euro and the mean loss almost 16000. For individuals experiencing losses of these magnitudes, our estimates point to increases in labour supply of 16 – 22 hours (for the 7600 euro loss), or 33 to 45 hours (for losses of around 16000 euro). In other words, on average, the mean losses in risky wealth observed in our sample would have led to individuals increasing their labour supply by between one part-time working week and one full-time working week. Given that mean annual hours in our sample (around 970 hours for the whole sample or 1140 hours across those who own risky assets) approximately correspond to a full year working part-time, we find these changes in hours to be non-trivial.

[10] These numbers are arrived at by multiplying the mean change in wealth (1.289 thousand euros) by the smallest and largest coefficients from the first row of Table 4.1.

The changes in hours are average effects, and may be driven by lots of workers making modest adjustments to hours, or may (partly) be the result of some workers choosing to participate rather than to quit their jobs or otherwise stay out of work. To look at whether there is an effect from wealth to labour market exits, we turn to the results for "leave work" in Table 4.2. The coefficients in the first row of the table are all significant at the 5% or 10% level. These point estimates suggest that a 1000 euro increase in wealth is associated with an increase in the probability of leaving work of between 0.05 percentage points and 0.08 percentage points. Combining these estimates with the average changes in wealth experienced in our sample of individuals with risky wealth, we arrive at predicted effects of a 0.4 to 0.6 percentage point reduction in the likelihood of leaving work for an individual who suffered a wealth loss of around 7600, or of around 0.8 to 1.3 percentage points if we consider an individual who suffered the loss of 16000 euros, which is the mean in our sample of risky wealth holders during the 2006 – 2008 period. Given that the baseline likelihood of leaving work in our sample is around 5 percentage points (across a two-year observation period), these predicted effects amount to a 10 to 20 percent change and again seem economically important.

4.2 Robustness analysis

In the previous subsection we discussed our results with and without controls for years of contributions to the state pension system and also that adding an indicator for (lagged) home-ownership, and controlling for the (reported) change in house value, did not noticeably affect our main results. We now consider whether our results are robust to further modifying the set of regressors or the sample.

Risk aversion

In the specifications reported above, we did not include any measure of risk aversion. The SHIW sample provides information on risk-aversion, asking individuals to report (on a scale from 1 to 4) whether they prefer assets with returns that are expected to be high but also highly variable, or whether they prefer safe assets that promise a lower average return. The majority of respondents (for exact proportions, see Appendix Tables A1 and A2) report that they are in the two more risk averse categories, in that they prefer safe or modestly

safe assets. Since risk aversion might be expected to be correlated with behavioural responses to shocks, and with asset and portfolio decisions, we have experimented with adding separate indicators for being risk averse (i.e. at point 3 on the risk-aversion scale) or very risk averse (at point 4 on the scale), to our baseline specifications. Table 4.3 reports the results, for the main coefficient of interest, when both of these risk aversion variables are added to the regressions.

Table 4.3: Robustness: Controlling for Risk Aversion

	OLS	IV	OLS	IV
Dependent Variable: Change in Hours of Work				
Δ Risky Financial Wealth	- 2.287 *	- 2.928 *	- 2.177 *	- 2.775 *
	(1.174)	*(1.621)*	*(1.203)*	*(1.636)*
High risk aversion	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
# Observations	7143	7143	6894	6894
Dependent Variable: Leave Work				
Δ Risky Financial Wealth	0.000637 **	0.000815 **	0.000537 **	0.000684 *
	(0.00262)	*(0.00041)*	*(0.00027)*	*(0.000400)*
High risk aversion	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
# Observations	7143	7143	6894	6894

Comparing the results in Table 4.3 to those reported in Tables 4.1 and 4.2, we see that our estimates are left almost unaffected when the risk aversion variables are added. Indeed, adding the variables tends to increase precision somewhat and so makes some results more significant.

Only risky asset holders

In the regressions reported above, the sample includes both households with and without exposure to risky financial wealth. Households that do not hold risky assets provide information that helps to identify coefficients on variables other than the main change in

risky financial wealth variable. To check that including these households does not substantially alter our estimates of our main coefficient of interest, we ran our regressions on the subsample of households that have exposure to risky financial wealth.[11] Table 4.4 reports the results, for the main coefficient of interest, for this subsample.

Table 4.4: Robustness: Sample including only holders of Risky financial wealth

	OLS	IV	OLS	IV
Dependent Variable: Change in Hours of Work				
Δ Risky Financial Wealth	- 3.249 ** *(1.605)*	- 3.690 * *(2.008)*	- 3.360 ** *(1.655)*	- 3.875 * *(2.114)*
Years of contributions	No	No	Yes	Yes
# Observations	1208	1208	1186	1186
Dependent Variable: Leave Work				
Δ Risky Financial Wealth	0.000993 *** *(0.000376)*	0.001128 ** *(0.00055)*	0.001052 *** *(0.000380)*	0.001213 ** *(0.000584)*
Years of contributions	No	No	Yes	Yes
# Observations	1208	1208	1186	1186

The results in Table 4.4 are similar to those in Tables 4.1 and 4.2. Indeed, the effects are slightly stronger, both in terms of point estimates and significance, when we use the subsample. As with our main results, the results in Table 4.4 are based on regressions that include dummies for financial wealth decile group; Appendix Table A.4.4 shows that in this subsample the coefficient of interest is not substantially affected (and significance is not changed) if the wealth level dummies are dropped. We interpret the results from analysis of this subsample as indicating that results based on our full sample certainly do not exaggerate estimates of the main coefficients of interest. In the remainder of the paper we stick to the broader sample and the more conservative estimates.

[11] Precisely, the subsample is those who have a non-zero value for the change in the value of the fixed portfolio that is the crucial variable to identify our IV and reduced form (OLS) estimators. This means that the sample is of those who held risky assets at the relevant lag (usually, of 2 survey periods).

4.3 Older subsample

It is of interest to consider whether our results are mainly due to certain types of agents. One particular check that we carry out is to restrict the age range in our regression sample. Table 4.5 reports results for an older subsample (those aged 50 to 69). The results align well with our baseline results. More specifically, the results for OLS regressions are very much in line with those reported in Tables 4.1 and 4.2, while the results for the IV specifications suggest slightly stronger effects (at least in terms of point estimates) in the older sample. In our exactly identified system (with one excluded variable for one endogenous variable), the bigger difference between the reduced form and the IV for this older sample reflects that the correlation at the first stage is less strong (with a coefficient of around 0.5 instead of 0.8). However, this is not a reflection of a weak instrument: the F-test gives a value in excess of 20 for this older subsample (full first stage results available on request).

Table 4.5: Older subsample, ages 50 - 69

	OLS	IV	OLS	IV
Dependent Variable: Change in Hours of Work				
Δ Risky Financial Wealth	- 2.507 * *(1.373)*	- 5.130 * *(2.869)*	- 2.337 * *(1.407)*	- 4.814 *(2.953)*
Years of contributions	No	No	Yes	Yes
# Observations	4476	4476	4346	4346
Dependent Variable: Leave Work				
Δ Risky Financial Wealth	0.000692 ** *(0.000338)*	0.001416 * *(0.000762)*	0.000571 *(0.00035)*	0.001176 *(0.000779)*
Years of contributions	No	No	Yes	Yes
# Observations	4476	4476	4346	4346

Overall, our interpretation is that our results for the older subsample are in line with our general results and that older working age, or early retirement age, individuals, are probably important in driving the results (we get much weaker patterns if we consider younger samples, results available from the authors on request). This is perhaps unsurprising given

that older households tend to have more financial wealth, and are also the households that might be considering whether to leave jobs (or not leave jobs) and enter (or not enter) retirement.

4.4 Family labour supply

So far we have considered individual-level responses to changes in wealth measured at the family level. Since 85% of our sample live as part of a couple, it is also of interest to measure changes at the family (single or couple) level. We thus turn to look at family level labour supply outcomes. That is, for those that live as part of a couple, the change in labour supply becomes the sum of the changes for the two partners, and the "leave work" dummy indicates that at least one member of the couple has stopped working. Table 4.6 reports results for these family-level variables. The fall in sample size compared to our baseline results is explained by the switch to the family (single or couple), rather than the individual, as the unit of observation.

The results in Table 4.6 show that family level responses to the wealth shock look rather larger than responses measured at the individual level. To decompose the mechanics of this "adding up" within couples, it is of interest to consider whether the stronger-looking family level effects are due to strong responses from either men or women, with little response from the other partner in couples, or whether responses seems to be shared between men and women. Results reported in Appendix Table A.4.6 show little difference in point estimates for males and females. Thus it seems that household level responses are, on average, shared between men and women. The responses of men and women considered separately are broadly in line with our baseline results in Tables 4.1 and 4.2.

Table 4.6: Family labour supply

	OLS	IV	OLS	IV	
Whole sample (age 25-69)					
Dependent Variable: Change in Hours of Work					
Δ Risky Financial Wealth	- 3.911 * *(2.124)*	- 5.053 * *(3.026)*	- 3.932 * *(2.142)*	- 5.026 *(3.019)*	
Years of contributions	No	No	Yes	Yes	
# Observations	4006	4006	3877	3877	
Dependent Variable: Leave Work					
Δ Risky Financial Wealth	0.001037 ** *(0.000449)*	0.001340 * *(0.000766)*	0.000927 * *(0.000453)*	0.001185 *(0.000737)*	
Years of contributions	No	No	Yes	Yes	
# Observations	4006	4006	3877	3877	
Older sample (age 50-69)					
Dependent Variable: Change in Hours of Work					
Δ Risky Financial Wealth	- 4.903 ** *(2.188)*	- 9.585 ** *(4.404)*	- 4.767 ** *(2.206)*	- 9.295 ** *(4.408)*	
Years of contributions	No	No	Yes	Yes	
# Observations	2556	2556	2484	2484	
Dependent Variable: Leave Work					
Δ Risky Financial Wealth	0.001156 ** *(0.000542)*	0.002258 * *(0.001219)*	0.001054 * *(0.00055)*	0.002055 * *(0.001219)*	
Years of contributions	No	No	Yes	Yes	
# Observations	2556	2556	2484	2484	

5. Conclusions

We have looked at whether shocks to asset values lead to labour supply adjustments, using Italian data. We used asset price shocks to provide a measure of wealth changes that is exogenous to households' saving and labour supply behaviour.

Our results suggest that wealth losses led to some increases in hours worked, and reductions in numbers leaving jobs. The magnitude of these effects could be substantial for those suffering larger wealth shocks (although such shocks are concentrated among relatively few owners of risky assets). For example, when combined with the mean losses in risky wealth among holders of risky wealth in our sample, our point estimates suggest average increases in labour supply of between one part-time working week and one full-time working week. Looking at the extensive margin for the same group, we found a decrease of between 0.5 and 1 percentage point (or 10 and 20 percent) in the likelihood of leaving work.

Family (couple) level responses look stronger than individual level results, and this seems to reflect similar responses from both men and women. The strongest responses come from those of older working-age and around retirement age.

As pension provisions and increasing longevity point towards individuals holding increasing amounts of private wealth, it becomes increasingly pertinent to understand such responses to wealth shocks.

References

Attanasio, Orazio P., and Guglielmo Weber (1993), "Consumption Growth, the Interest Rate and Aggregation", *The Review of Economic Studies* 60, 631-49.

Banks, James, Richard Blundell and Sarah Tanner (1998), "Is there a Retirement-Savings Puzzle", *American Economic Review* 88(4), 769 – 788.

Banks, James, Rowena Crawford, Thomas F. Crossley and Carl Emmerson (2012), *The Effects of the Financial Crisis on Older Households in England*, IFS Working Paper W12/09.Bottazzi, Trucchi, and Wakefield (2013)

Bottazzi, Renata, Serena Trucchi and Matthew Wakefield, (2013), *Wealth effects and the consumption of Italian households in the Great Recession*, IFS Working Paper W13/21.

Bottazzi, Renata, Serena Trucchi and Matthew Wakefield, (2017), *Consumption responses to a large shock to financial wealth: evidence from Italy*, University of Essex, Department of Economics Discussion Papers number 20188, http://repository.essex.ac.uk/20188/.

Coile, Courtney C., and Phillip B. Levine (2011), "The Market Crash and Mass Layoffs: How the Current Economic Crisis May Affect Retirement", *The B.E. Journal of Economic Analysis and Policy*, Berkeley Electronic Press, vol. 11(1), 22 pages.

Crawford, Rowena (2013), "The effect of the financial crisis on the retirement plans of older workers in England", *Economics Letters* 121, 156-159.

Disney, Richard, and John Gathergood (2017 (forthcoming)), *House Prices, Wealth Effects and Labour Supply*, forthcoming, *Economica*.

Disney, Richard, Anita Radcliffe and Sarah Smith (2015), "Booms, Busts and Retirement Timing", Economica 82, 399 – 419.

Dynan, Karen E., and Dean M. Maki (2001), *Does Stock Market Wealth Matter for Consumption?*, Board of Governors of the Federal Reserve Systems "FEDS" (Finance and Economics Discussion Series) paper 2001-23, May 2001.

Schwandt, Hannes (2017), *Wealth Shocks and Health Outcomes: Evidence from Stock Market Fluctuations*, CEP Discussion Paper 1281.

Appendix

Appendix Table A1: Descriptive statistics, independent variables (Regression sample, ages 25 – 69)

Variable	Obs	Mean	Std. Dev.	Min	Max
Delta risky fin. wealth	7,143	-1.289343	7.783253	-161.2254	30.19389
Couple	7,143	.8530029	.3541278	0	1
Delta no. of people in HH	7,143	-.0778384	.4522451	-4	4
Male	7,143	.4628307	.4986514	0	1
Age	7,143	52.84278	9.58248	25	69
Low education	7,143	.5220496	.4995485	0	1
High-school ed	7,143	.3784124	.4850252	0	1
Post-school ed	7,143	.099538	.299404	0	1
Regional unempl	7,143	8.134887	3.865738	3.2	14.7
Year 2010	7,143	.5063699	.4999944	0	1
Northern Italy	7,143	.4474311	.4972636	0	1
Central Italy	7,143	.1850763	.3883866	0	1
Southern Italy	7,143	.3674927	.4821559	0	1
Public-sect. em	7,143	.1651967	.371384	0	1
Self-employed	7,143	.1178776	.3224858	0	1
Wealth(lag)_zero	7,143	.1258575	.3317119	0	1
Wealth(lag)	7,143	24058.87	47670.39	0	881986.3
Years of contrib	6,894	21.55947	13.36349	0	50
Risk averse= 3	7,143	0.384			
Risk averse= 4	7,143	0.419			

Appendix Table A2: Descriptive statistics, independent variables (50+ sample)

Variable	Obs	Mean	Std. Dev.	Min	Max
Delta risky fin. wealth	4,476	-1.427547	8.538941	-161.2254	30.19389
Couple	4,476	.8476318	.3594176	0	1
Delta no. of people in HH	4,476	-.1255585	.4824139	-4	4
Male	4,476	.4868186	.4998821	0	1
Age	4,476	58.95979	5.600454	50	69
Low education	4,476	.5810992	.4934342	0	1
High-school ed	4,476	.3190349	.4661547	0	1
Post-school ed	4,476	.099866	.2998547	0	1
Regional unempl	4,476	8.140282	3.836436	3.2	14.7
Year 2010	4,476	.5107239	.4999408	0	1
Northern Italy	4,476	.4401251	.4964575	0	1
Central Italy	4,476	.1921358	.3940233	0	1
Southern Italy	4,476	.3677391	.4822437	0	1
Public-sect. em	4,476	.1572833	.3641083	0	1
Self-employed	4,476	.0996425	.2995563	0	1
Wealth(lag)_zero	4,476	.1291332	.3353847	0	1
Wealth(lag)	4,476	27469.48	50967.99	0	681239.8
Years of contrib	4,346	25.40865	13.69228	0	50
Risk averse= 3	4,476	0.372			
Risk averse= 4	4,476	0.438			

Table A.4.1(a): Baseline Results for "Change in Hours of Work"

Dependent Variable: Change in Hours of Work

	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Δ risky financial wealth	**-2.233***	**-2.854***	**-2.102***	**-2.673***	**-1.188**	**-1.511**	**-2.250***	**-2.973***
	(1.169)	(1.605)	(1.197)	(1.617)	(1.075)	(1.375)	(1.200)	(1.730)
Couple	8.851	7.595	11.87	10.33	1.817	0.993	11.809	10.065
	(17.42)	(17.62)	(18.06)	(18.27)	(16.955)	(17.060)	(18.058)	(18.315)
Δ no. of people in HH	15.67	17.25	19.42	20.85	15.116	16.256	19.432	21.020
	(17.92)	(18.02)	(18.18)	(18.25)	(18.105)	(18.206)	(18.197)	(18.292)
Male	-91.43***	-91.39***	-67.79***	-67.75***	-92.434***	-92.507***	-68.540***	-68.929***
	(12.88)	(12.95)	(14.76)	(14.81)	(12.804)	(12.808)	(14.765)	(14.833)
High-school education	13.10	11.50	8.144	6.636	13.598	12.571	8.320	6.747
	(14.90)	(15.00)	(15.15)	(15.24)	(14.320)	(14.437)	(15.155)	(15.243)
Post-school education	57.12**	56.31**	45.77**	44.73*	50.842**	50.528**	44.712*	42.938*
	(23.01)	(23.39)	(22.97)	(23.39)	(22.512)	(22.632)	(22.967)	(23.468)
Regional unemployment rate	8.081*	9.625**	4.797	6.269	8.820*	9.651**	4.655	6.209
	(4.668)	(4.787)	(4.645)	(4.771)	(4.512)	(4.618)	(4.655)	(4.788)
Year 2010	-33.12*	-32.35*	-25.64	-24.77	-34.904*	-34.431*	-25.406	-24.298
	(18.66)	(18.74)	(18.61)	(18.70)	(18.311)	(18.352)	(18.627)	(18.743)
Central Italy	-3.580	0.344	-7.994	-4.291	-1.294	0.232	-8.749	-5.074
	(18.01)	(18.37)	(18.03)	(18.39)	(17.954)	(18.115)	(18.052)	(18.420)
Southern Italy	-54.94	-62.81*	-44.06	-51.54	-53.682	-58.177	-43.027	-50.740
	(36.47)	(37.03)	(35.79)	(36.36)	(35.629)	(35.939)	(35.850)	(36.481)
Public sector employee	-24.87	-24.05	-282.0*	28.14	-26.025	-25.670	-283.087*	-29.058
	(19.67)	(19.83)	(146.0)	(26.98)	(19.555)	(19.612)	(146.000)	(27.006)
Self employed	-47.51	-48.21	-41.99	-42.66	-48.159	-51.889	-41.152	-41.402
	(32.11)	(32.23)	(33.22)	(33.29)	(32.776)	(31.690)	(33.165)	(33.230)
Wealth (lagged) dummies	Yes	Yes	Yes	Yes	No	No	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes	No	No	Yes	Yes
Δ housing wealth	No	No	No	No	No	No	Yes	Yes
Constant	-129.9**	-137.5**	-112.5**	-109.5**	-48.159	-52.433	-111.379**	-109.460**
	(44.26)	(46.20)	(52.15)	(47.19)	(32.776)	(33.425)	(52.155)	(47.292)
N	7143	7143	6894	6894	7290	7290	6894	6894

Table A.4.1(b) : First-stage regressions (for specification in column 2 of Table 4.1)

```
Number of obs =                  7143
------------------------------------------------------------------------------
                 |               Robust
delta_valueim~ad |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------+------------------------------------------------------------
  instimp_dbroad |   .7825504   .2130959     3.67   0.000     .3648189    1.200282
         couple |  -.4400646   .5661625    -0.78   0.437    -1.549912    .6697824
     delta_ncomp |   .5528101   .4872717     1.13   0.257    -.4023874    1.508008
             sex |    .014102   .5884712     0.02   0.981    -1.139477    1.167681
     dstudio_med |  -.5610499   .5252347    -1.07   0.285    -1.590666    .4685663
     dstudio_hig |  -.2859218   1.374913    -0.21   0.835     -2.98116    2.409316
          regurt |   .5407937   .1629716     3.32   0.001     .2213209    .8602666
         danno10 |   .2703936   .5077687     0.53   0.594     -.724984    1.265771
          centro |    1.37479   .7429486     1.85   0.064    -.0816107     2.83119
             sud |  -2.758944   1.241842    -2.22   0.026    -5.193325    -.324564
publsect_dip_lag |   .2853561   .7652291     0.37   0.709    -1.214721    1.785433
        self_lag |  -.2484986   1.389333    -0.18   0.858    -2.972005    2.475008
5-year age dummies       Yes
Wealth (lagged) dummies  Yes
          _cons |  -2.649048   2.004699    -1.32   0.186    -6.578855     1.28076
------------------------------------------------------------------------------
Sanderson-Windmeijer multivariate F test of excluded instruments:
  F(  1,  4272) =    13.49
  Prob > F      =   0.0002
```

Table A.4.2: Baseline Results for "Leave Work"

Dependent Variable: Leave Work

	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Δ risky financial wealth	**0.000634****	**0.000810****	**0.000523***	**0.000665***	**0.000497****	**0.000631***	**0.000553****	**0.000731***
	(0.000260)	(0.000403)	(0.000269)	(0.000394)	(0.000232)	(0.000342)	(0.000275)	(0.000429)
Couple	0.000467	0.000823	-0.000152	0.000230	0.002081	0.00243	-0.000141	0.000288
	(0.00754)	(0.00754)	(0.00768)	(0.00768)	(0.00704)	(0.00705)	(0.00768)	(0.00768)
Δ no. of people in HH	0.00166	0.00122	0.0000935	-0.000261	0.00111	0.0006377	0.0000920	-0.000299
	(0.00751)	(0.00751)	(0.00761)	(0.00761)	(0.00744)	(0.00744)	(0.00761)	(0.00761)
Male	0.0183***	0.0183***	0.00858	0.00857	0.0190***	0.0191***	0.00874	0.00883
	(0.00538)	(0.00540)	(0.00571)	(0.00572)	(0.00532)	(0.00533)	(0.00571)	(0.00573)
High-school education	-0.0131**	-0.0127**	-0.00854	-0.00816	-0.0148**	-0.0144**	-0.00857	-0.00819
	(0.00611)	(0.00613)	(0.00603)	(0.00605)	(0.00581)	(0.00584)	(0.00603)	(0.00605)
Post-school education	-0.0288**	-0.0286**	-0.0185**	-0.0182**	-0.0289***	-0.0287***	-0.0183**	-0.0178*
	(0.00921)	(0.00933)	(0.00902)	(0.00912)	(0.0087)	(0.00881)	(0.00903)	(0.00914)
Regional unemployment rate	-0.00173	-0.00217	-0.00133	-0.00170	-0.00184	-0.00218	-0.00130	-0.00169
	(0.00208)	(0.00211)	(0.00203)	(0.00206)	(0.00203)	(0.00206)	(0.00203)	(0.00206)
Year 2010	-0.00352	-0.00374	-0.00644	-0.00665	-0.00352	-0.00371	-0.00649	-0.00676
	(0.00673)	(0.00676)	(0.00658)	(0.00660)	(0.00661)	(0.00663)	(0.00659)	(0.00661)
Central Italy	0.000703	-0.000410	0.000697	-0.000224	0.000166	-0.000804	0.000853	-0.000505
	(0.00723)	(0.00728)	(0.00719)	(0.00723)	(0.00708)	(0.00713)	(0.00719)	(0.00724)
Southern Italy	0.0207	0.0230	0.0194	0.0213	0.0240	0.0259	0.0192	0.0211
	(0.0168)	(0.0170)	(0.0162)	(0.0164)	(0.0165)	(0.0166)	(0.0162)	(0.0164)
Public sector employee	0.0482***	0.0480***	0.198**	0.0248**	0.0460***	0.0459***	0.199***	0.0246**
	(0.00916)	(0.00918)	(0.0697)	(0.0106)	(0.00902)	(0.00904)	(0.0698)	(0.0106)
Self employed	0.0307**	0.0309**	0.0261**	0.0263**	0.0302**	0.0306**	0.0259***	0.0260***
	(0.00982)	(0.00990)	(0.00992)	(0.00997)	(0.00960)	(0.00966)	(0.00991)	(0.00997)
Wealth (lagged) dummies	Yes	Yes	Yes	Yes	No	No	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes	No	No	Yes	Yes
Δ housing wealth	No	No	No	No	No	No	Yes	Yes
Constant	0.0426**	0.0448**	0.0299*	0.0349*	0.0318**	0.0336**	0.0297*	0.0349*
	(0.0171)	(0.0175)	(0.0180)	(0.0180)	(0.0130)	(0.0132)	(0.0180)	(0.0180)
N	7143	7143	6894	6894	7290	7290	6894	6894

Table A.4.4: Sample with only Risky Asset Holders

Dependent Variable: Change in Hours of Work								
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Δ risky financial wealth	- 3.249 **	- 3.690 *	- 3.360 **	- 3.875 *	-2.753 **	-3.287 *	-3.470 **	-4.111 *
	(1.605)	*(2.008)*	*(1.655)*	*(2.114)*	(1.301)	(1.719)	(1.660)	(2.246)
Wealth (lagged) dummies	Yes	Yes	Yes	Yes	No	No	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes	No	No	Yes	Yes
Δ housing wealth	No	No	No	No	No	No	Yes	Yes
N	1208	1208	1186	1186	1222	1222	1186	1186

Dependent Variable: Leave Work								
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Δ risky financial wealth	0.000993 ***	0.001128 **	0.001052 ***	0.001213 **	0.000787 ***	0.000940 **	0.001028 ***	0.001218 **
	(0.000376)	*(0.00055)*	*(0.000380)*	*(0.000584)*	(0.000293)	(0.000460)	(0.000382)	(0.000608)
Wealth (lagged) dummies	Yes	Yes	Yes	Yes	No	No	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes	No	No	Yes	Yes
Δ housing wealth	No	No	No	No	No	No	Yes	Yes
N	1208	1208	1186	1186	1222		1186	1186

Table A.4.6: Labour supply for women and men

Subsample: Females				
Dependent Variable: Change in Hours of Work				
	OLS	IV	OLS	IV
Δ risky financial wealth	-1.778	-2.233	-1.970	-2.467
	(1.295)	*(1.708)*	*(1.370)*	*(1.830)*
Wealth (lagged) dummies	Yes	Yes	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
Δ housing wealth	No	No	No	No
N	3837	3837	3668	3668
Dependent Variable: Leave Work				
	OLS	IV	OLS	IV
Δ risky financial wealth	0.000754 *	0.000947	0.000756 *	0.000947
	(0.000388)	*(0.000602)*	*(0.000409)*	*(0.000627)*
Wealth (lagged) dummies	Yes	Yes	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
Δ housing wealth	No	No	No	No
N	3837	3837	3668	3668
Subsample: Males				
Dependent Variable: Change in Hours of Work				
	OLS	IV	OLS	IV
Δ risky financial wealth	-2.595	-3.333	-2.181	-2.801
	(1.905)	*(2.650)*	*(1.930)*	*(2.607)*
Wealth (lagged) dummies	Yes	Yes	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
N	3306	3306	3226	3226
Dependent Variable: Leave Work				
	OLS	IV	OLS	IV
Δ risky financial wealth	0.000636 *	0.000817	0.000408	0.000525
	(0.000364)	*(0.000573)*	*(0.000375)*	*(0.000533)*
Wealth (lagged) dummies	Yes	Yes	Yes	Yes
5-year age dummies	Yes	Yes	Yes	Yes
Years of contributions	No	No	Yes	Yes
N	3306	3306	3226	3226