Wealth effect on consumption during the sovereign debt crisis: households heterogeneity in the Euro area

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This paper presents the authors' views and should not be interpreted as reflecting the views of INSEE or the Banque de France.

Motivation

❑ **Context**

- Sovereign debt crisis (2011-2012), after the 2008 financial crisis
- Non-conventional monetary policy (2012) to ease euro area financial conditions and to contribute to economic recovery (Praet, 2017).

❑ **New concerns about monetary transmission : Heterogeneous effects across households**

Auclert (2019) Coibion et al. (2017) Cloyne et al. (2018) Kaplan et al. (2018)

❑ **Wealth-consumption channel : unexpected changes in wealth (asset prices)**

Heterogeneous marginal propensity to consume (MPC) depending on the type of the shocks, assets and debt composition

❑ **This paper: micro-based estimates of the marginal propensity to consume out of wealth**

- **within and across five Euro area countries (Belgium, Cyprus, Germany, Spain, and Italy)**
- **using two waves of a microdata panel survey covering 2010-2014.**

=> **We cover a wide cross country heterogeneity: country size, economic situations and asset prices developments**

France is not included: data constraints (no panel component in Enquête Patrimoine before 2014)

Table 1. Macro developments
Asset prices and consumption (%) between wave 1 and wave 2

	Belgium	Cyprus	Germany	Spain	Italy
Period covered by the survey	2010-2014	2010-2014	2011-2014	2009-2012	2010-2014
Aggregate asset prices					
House prices	7.0	-10.1	10.0	-22.7	-11.9
Domestic shares	14.4	-87.7	48.4	-33.6	-9.5
Government bonds	13.2	7.2	4.6	-7.5	9.4
Interest rates on deposits	12.0	16.3	5.9	8.3	10.1
Financial corporation bonds	8.6	8.6	12.7	7.1	8.6
Non-financial corporation bonds	5.3	5.3	9.0	5.4	5.3
Foreign companies	42.1	42.1	46.2	28.5	42.1
Aggregate households' consumption	1.0	-8.7	1.6	-6.3	-6.7

Sources:
House prices: country specific house price index (Eurostat). Domestic shares: BEL-20 (Belgium), FTSE Cyprus SE20, DAX 30 (Germany), IBEX 35 (Spain), FTSE MIB Index (Italy). Government bonds: country specific FTSE Global government bonds (all maturities), not available for Cyprus (we then consider the Eurozone index). Interest rates on deposits: Bank interest rates on deposits from households (country specific, source: ECB). Financial corporation bonds: FTSE Euro corporate bonds index (non-financials), financial corporation bonds: FTSE euro corporate bonds (financials). Foreign companies: FTSE all word equities index.
Households' consumption: final household consumption expenditure. Growth rate adjusted by inflation (IPCH). Source: Eurostat

This paper

- Do these prices developments affect consumption over 2010-2014 in Euro area countries?

- How do the household wealth composition and debt affect the marginal propensity to consume out of wealth?

- Is there cross-country heterogeneity in the wealth-consumption channel?

Our contribution

- **Micro based estimates of the Marginal Propensity to Consume out of wealth** (MPC): for several countries using a harmonized household level empirical approach (data and methods)

- **Data sources**: Assets and debt (**HFCS**- ECB), Consumption (**HBS**-Eurostat), and disposable income (**SILC**-Eurostat)

- **Panel estimations**: We consider the countries where same households are surveyed in the two waves: BE, DE, IT, CY, ES.

- **Intrumental variable**: simulated net wealth considering only prices developments (without active savings / portfolio rebalancing, cf. Banks et al., 2012, Bottazzi et al. 2017)

=> Various dimensions of MPC heterogeneity both across and within countries

Related literature

- **Impact of monetary policy on household consumption** (wealth effect, interest rate and other channels)

e.g. Auclert (2017), Cloyne et al. (2018), Jappelli and Scognamiglio (2018), Hintermaier and Koeniger (2018)

- **Macro literature on the wealth effect on consumption**

Muellbauer (2010), Carroll et al. (2011), Aron et al. (2012), Guerrieri and Mendicino (2018)

- **Wealth effect and MPC heterogeneity**

e.g. Campbell and Cocco (2007), Carroll et al. (2017), Christelis et al. (2015), Kaplan et al. (2014), Mian et al. (2013), Arrondel et al. (2018)

- **Papers based on wealth surveys and using panel data**

Banks et al. (2012): ELSA (U.K)

Bottazzi et al. (2017): SHIW (Italy)

$\Rightarrow$ We follow this literature: Control for individual fixed effects + instrument for exogeneous variations in household wealth

Main results

- **Significant wealth effects** on consumption + cross-country heterogeneity

	Belgium	Cyprus	Germany	Spain	Italy
MPC	**0.023** ***	**0.005** *	**0.008** ***	**0.016** ***	**0.046** ***
Std. Err.	*0.006*	*0.003*	*0.003*	*0.005*	*0.006*

Dependent variable: non-durable consumption. IV- 2SLS (first differences)

- MPC estimates **close to macro-based estimates** (Cf. Guerrieri and Mendicino, 2018) and larger than the estimates obtained on cross-sectional data
- Housing and financial wealth effects
- Robustness of the results when **accounting for permanent income shocks**
- The **MPC is decreasing across the net wealth** distribution, for all non durable consumption expenditure
- **Asymetries in consumption reaction to losses/gains** (Spain)
- **Consumption inequality**: simple simulation exercice: positive housing prices shock decreases consumption inequality (limited effect of financial assets)

Data

❑Data sources

- **HFCS wave 1 and 2 (ECB)** : assets, debt and demographics.

It also includes:

- Some detailed questions on consumption expenditures
- Gross income

- **Total non-durable consumption** is imputed to HFCS households using the Household Budget Surveys (Eurostat) –
- Skinner's method: auxiliary regression in HBS (non durable consumption) used to predict non durable consumption in HFCS
- Then, rank hot deck imputation stratified by tenure status and household composition (D'Orazio et al., 2006)

[Consumption]

- **Disposable income** is imputed to HFCS households using SILC (Eurostat), and a rank-hotdeck procedure

[Income]

Data

❑ Sample selection :

Countries (panel): Belgium, Germany, Italy , Cyprus and Spain.

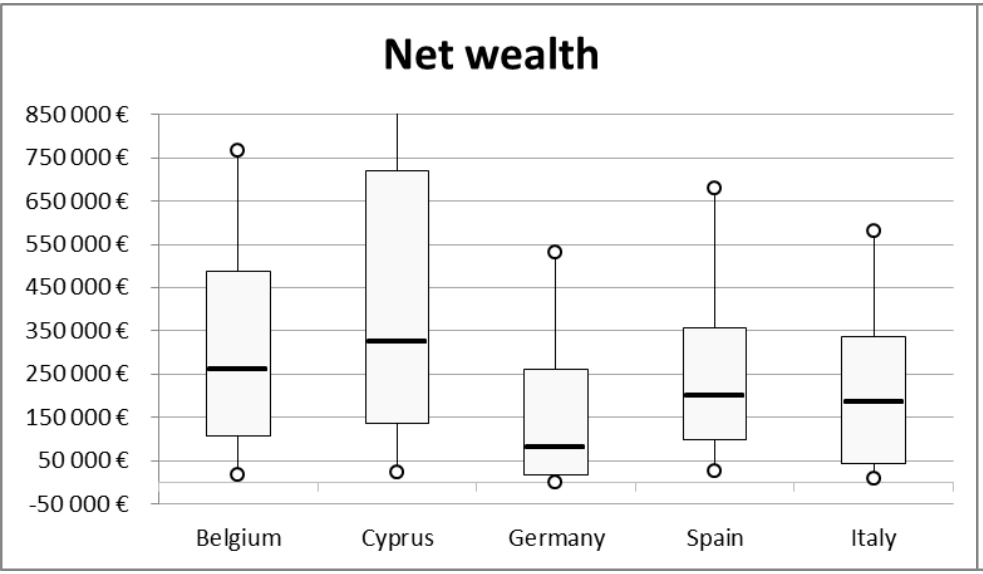
	HFCS reference period		# Panel households
	wave 1	wave 2	
Belgium	2010	2014	845
Cyprus	2010	2014	812
Germany	2011	2014	1,776
Spain	2009	2012	3,023
Italy	2010	2014	2,356

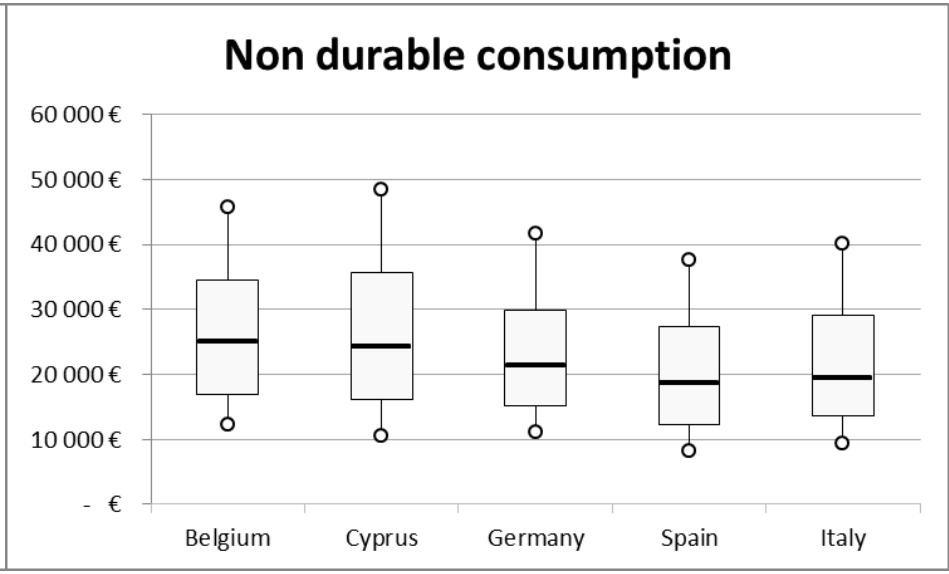
The number of panel households is computed after sample selection.
We select households where the reference person is aged between 25 and 75 years old.
We exclude some households with extreme values in consumption to disposable income ratio (top 1% and bottom 1%), in wealth (top 0.1%), disposable income (top 0.1%) and in debt (debt/total assets>100).

Data

- **Heterogeneity in wealth and consumption distributions across and within countries (Wave 1)**

(median, Q1, Q3, P10, P90)





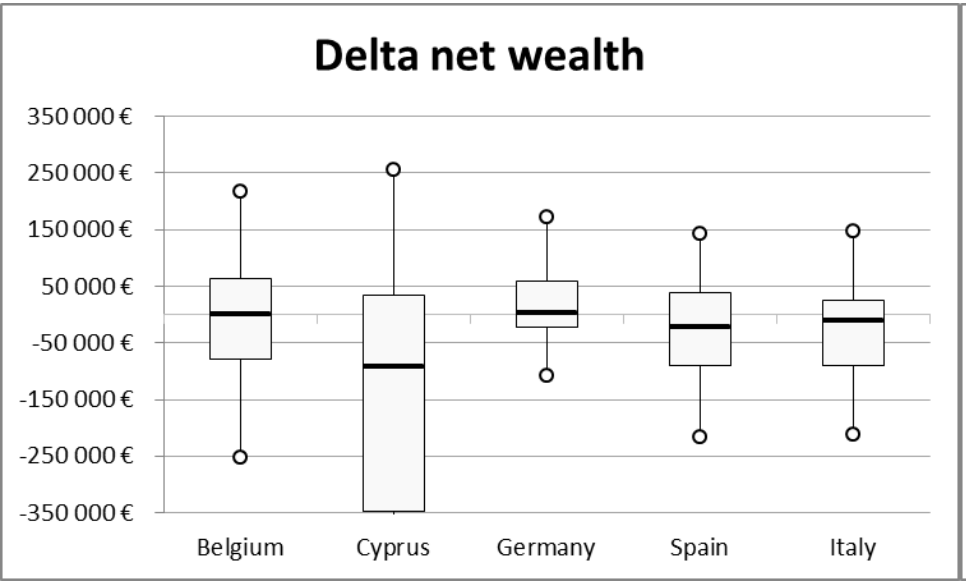
Figures computed on the estimation sample. Wave 1. Weighted statics.

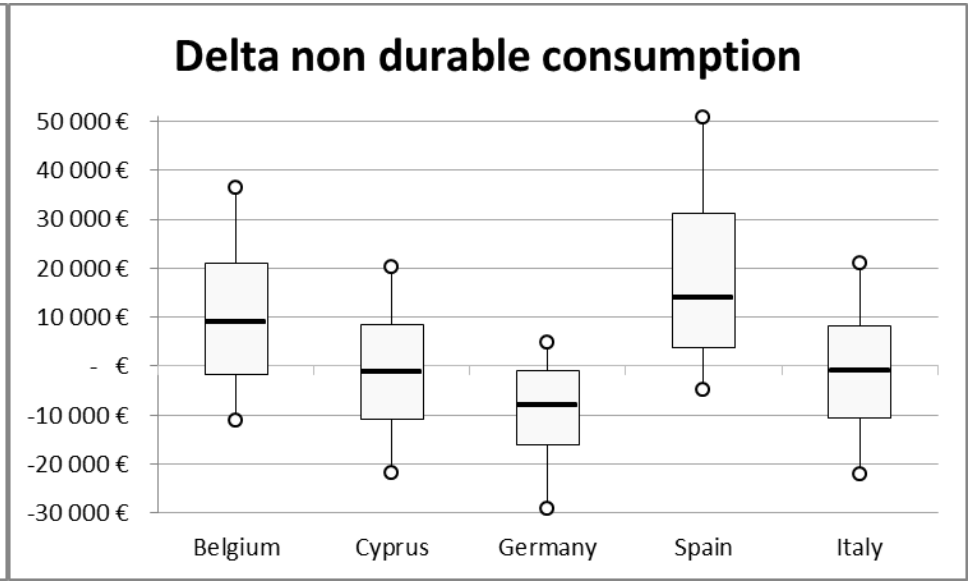
P9 for net wealth in Cyprus amounts to 1,669,241 euros. Non-durable consumption is imputed to HFCS households using the Household Budget Surveys and applying the rank hot deck imputation.

Data

- **Heterogeneity in the changes in wealth and consumption across and within countries between wave 1 and wave 2**

(median, Q1, Q3, P10, P90)





Figures computed on the estimation sample. Delta is the difference between the value of net wealth (non-durable consumption) in wave 2 and in wave 1. Values are adjusted for inflation between wave 1 and wave 2. P10 for Cyprus is -889,976 €.

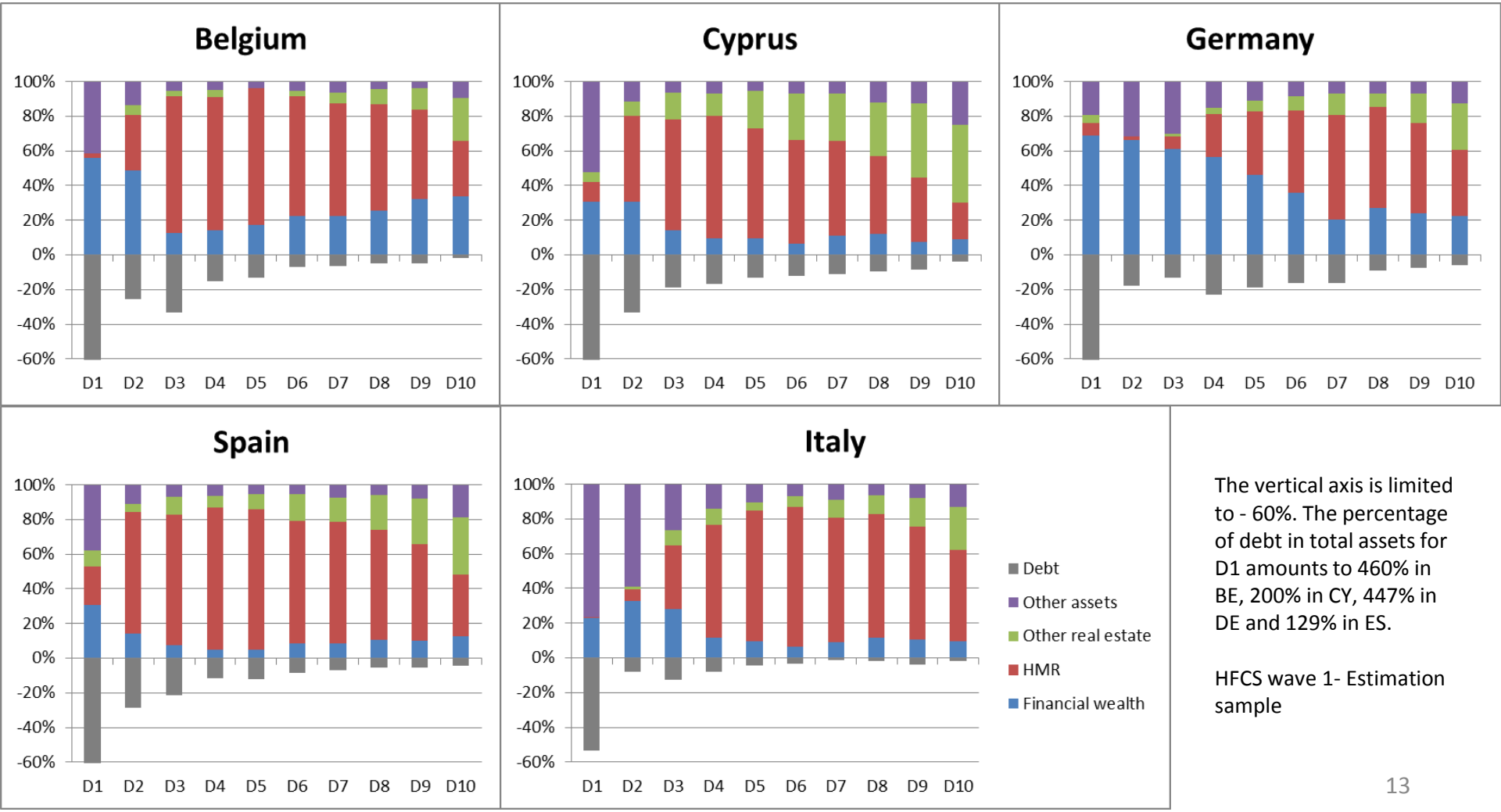
Non-durable consumption is imputed to HFCS households using the Household Budget Surveys and applying a rank hot deck imputation.

[counterfactual gains/losses in wealth]

Data

❑Heterogeneity in assets and debt

(% total assets, by net wealth decile – HFCS wave 1)



The vertical axis is limited to - 60%. The percentage of debt in total assets for D1 amounts to 460% in BE, 200% in CY, 447% in DE and 129% in ES.

HFCS wave 1- Estimation sample

Empirical model

- **Instrumented panel regression approach**
- **Reduced form based on the life-cycle model**

$$\frac{C_{h,t}}{Y_{h,t}} = \beta_0 + \beta_1 \frac{W_{h,t}}{Y_{h,t}} + \gamma Z_{h,t} + e_h + u_{h,t} \qquad (1)$$

$C_{h,t}$: non durable consumption of household *h* at time *t*

$Y_{h,t}$: Disposable income ; $W_{h,t}$: Wealth ; $Z_{h,t}$: Other controls; e_h : Household fixed effect

- **Endogeneity issues**

1) **Omitted variable bias**: risk aversion, time preferences, etc.

==> For time invariant omitted variable : Panel data. Model (1) with individual fixed effects, estimated in first differences

2) **Simultaneity bias**: Consumption and wealth may be simultaneously driven by a common factor (i.e. expectations about economic growth)

==> Instrumental variable

Empirical model

❑ Instrumental variable approach

First stage regression:

$$\Delta \frac{W_h}{Y_h} = \alpha_0 + \sum_{i=1}^{I} \alpha_1^i \, \Delta \frac{CW_h^i}{Y_h} + \omega \Delta Z_h + \mu_h$$

Where $\Delta \frac{CW_h^i}{Y_h}$ stands for the changes **in the counterfactual value** of the *ith* wealth components (divided by income) of the household *h* between wave 1 and wave 2:

- **considering household total assets composition in wave 1**,
- **applying the country-specific prices developments between the two waves** for each type of assets (two alternative set of instruments based on 8 or 14 assets decomposition). [Asset decomposition]

Assumption: exogeneous variations in asset prices at the household level over the period due to the sovereign debt crisis and ECB policy measures

=>The simulated portfolio does not include endogeneous savings decisions over the period, and reflects only (exogeneous) prices variations.

Baseline results: Marginal propensity to consume out of wealth at the mean
OLS, IV panel and cross-section estimates

	Panel						Cross-section			
	(1)		(2)		(3)		(4)		(5)	
					Baseline model					
	OLS		IV - 14 instr.		IV - 8 instr.		1st wave		2nd wave	
	MPC	Std. Err.	MPC	Std. Err.	MPC	Std. Err.	MPC	Std. Err.	MPC	Std. Err.
Belgium	0.009 ***	0.002	0.017 ***	0.004	0.023 ***	0.006	0.003 ***	0.001	0.003 ***	0.001
			[0.015 ; 0.023]		[0.019 ; 0.028]					
			Fstat	*34.2*	*Fstat*	*12.8*				
Cyprus	0.002 **	0.001	0.004	0.002	0.005 *	0.003	0.000	0.001	0.000	0.000
			[0.004 ; 0.006]		[0.005 ; 0.008]					
			Fstat	*4.9*	*Fstat*	*25.4*				
Germany	0.004 ***	0.001	0.008 ***	0.003	0.008 ***	0.003	0.000	0.001	0.000	0.001
			[0.007 ; 0.010]		[0.006 ; 0.010]					
			Fstat	*439.3*	*Fstat*	*88.7*				
Spain	0.004 **	0.002	0.012 ***	0.004	0.016 ***	0.005	0.003 ***	0.000	0.005 ***	0.001
			[0.014 ; 0.018]		[0.014 ; 0.018]					
			Fstat	*15.1*	*Fstat*	*9.4*				
Italy	0.021 ***	0.003	0.047 ***	0.006	0.046 ***	0.006	0.009 ***	0.001	0.008 ***	0.001
			[0.046 ; 0.058]		[0.045 ; 0.057]					
			Fstat	*27.7*	*Fstat*	*33.6*				

Estimated MPC and standard errors. The IV panel regressions (columns 2 and 3) also display in brackets the Andersen-Rubin confidence interval and the F statistics from the first-stage regressions.
Control variables for panel regressions (columns 1 to 3): changes between wave 2 and wave 1 in age and age² of the reference person, employment status (whether the reference person is retired (Yes/No), unemployed (Yes/No)), and household composition (number of adults and number of children).
Control variables for the cross-section regressions (columns 4 and 5): age (6 categories), situation on the labour market (employed, self-employed, retired, unemployed, other), education, and household composition (number of adults and number of children).
Number of observations: Belgium (845), Cyprus (812), Germany (1,776), Spain (3,023) and Italy (2,356).

Baseline results: Marginal propensity to consume out of wealth at the mean
OLS, IV panel and cross-section estimates

	Panel				Cross-section			
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					Baseline model			
	OLS		IV - 14 instr.		IV - 8 instr.		1st wave	2nd wave
	MPC	Std. Err.	MPC	Std. Err.	MPC	Std. Err.	MPC Std. Err.	MPC Std. Err.
Belgium	0.009 ***	0.002	0.017 ***	0.004	0.023 ***	0.006	0.003 *** 0.001	0.003 *** 0.001
			[0.015 ; 0.023]		[0.019 ; 0.028]			
			Fstat	*34.2*	*Fstat*	*12.8*		
Cyprus	0.002 **	0.001	0.004	0.002	0.005 *	0.003	0.000 0.001	0.000 0.000
			[0.004 ; 0.006]		[0.005 ; 0.008]			
			Fstat	*4.9*	*Fstat*	*25.4*		
Germany	0.004 ***	0.001	0.008 ***	0.003	0.008 ***	0.003	0.000 0.001	0.000 0.001
			[0.007 ; 0.010]		[0.006 ; 0.010]			
			Fstat	*439.3*	*Fstat*	*88.7*		
Spain	0.004 **	0.002	0.012 ***	0.004	0.016 ***	0.005	0.003 *** 0.000	0.005 *** 0.001
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Number of observations: Belgium (845), Cyprus (812), Germany (1,776), Spain (3,023) and Italy (2,356).

Marginal propensity to consume out of housing and financial wealth – OLS and IV panel estimates

		Belgium	Cyprus	Germany	Spain	Italy
OLS estimates (Panel)						
Housing wealth	MPC	0.012 ***	0.005 ***	0.004 ***	0.009 ***	0.023 ***
	Std. Err.	(0.003)	(0.001)	(0.001)	(0.003)	(0.003)
Financial wealth	MPC	0.004	0.003	0.011 ***	0.004	0.021 **
	Std. Err.	(0.003)	(0.004)	(0.002)	(0.003)	(0.009)
Other controls		Yes	Yes	Yes	Yes	Yes
IV estimates (Panel - 8 instruments)						
Housing wealth	MPC	0.025 **	0.011 **	0.016 ***	0.015 **	0.044 ***
	Std. Err.	(0.010)	(0.004)	(0.004)	(0.007)	(0.006)
	Fstat	*20.7*	*21.6*	*16.5*	*10.5*	*33.3*
	SW Fstat	*6.0*	*51.1*	*15.9*	*5.5*	*18.1*
Financial wealth	MPC	0.017	0.032 **	0.010 *	0.026 ***	0.164 **
	Std. Err.	(0.013)	(0.015)	(0.005)	(0.009)	(0.078)
	Fstat	*8.1*	*19.8*	*74.3*	*3.6*	*5.6*
	SW Fstat	*3.5*	*29.4*	*50.3*	*3.2*	*6.5*
Other controls		Yes	Yes	Yes	Yes	Yes
Number of households		845	812	1,776	3,023	2,356

Marginal propensity to consume out of wealth across the net wealth distribution – IV panel estimates

		Belgium		Cyprus		Germany		Spain		Italy	
Specification: number of instruments		14*4 instr.	8*4 instr.	14*4 instr.	8*4 instr.	14*4 instr.	8*4 instr.	14*4 instr.	8*4 instr.	14*4 instr.	8*4 instr.
Δ(W/Y) * p0-p49	MPC	0.049 **	0.065 ***	0.019	0.035 ***	0.046 **	0.036	0.056 ***	0.057 ***	0.062 ***	0.064 ***
	Std. Err.	(0.020)	(0.019)	(0.012)	(0.010)	(0.018)	(0.022)	(0.011)	(0.013)	(0.012)	(0.013)
	Fstat	*66.1*	*4.8*	*6.5*	*5.6*	*9.6*	*21.2*	*58.9*	*9.5*	*31.7*	*8.8*
	SW-Fstat	*71.8*	*5.4*	*6.9*	*6.1*	*10.1*	*27.7*	*63.3*	*10.7*	*33.1*	*9.8*
Δ(W/Y) * p50-p69	MPC	0.076 ***	0.075 ***	0.036 ***	0.036 ***	0.028 **	0.032 ***	0.058 ***	0.062 ***	0.066 ***	0.070 ***
	Std. Err.	(0.013)	(0.013)	(0.009)	(0.009)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.014)
	Fstat	*10.3*	*6.4*	*5.9*	*8.8*	*8.2*	*5.4*	*8.6*	*6.6*	*32.9*	*16.3*
	SW-Fstat	*11.2*	*7.4*	*6.3*	*9.7*	*8.7*	*11.6*	*10.4*	*8.4*	*37.9*	*25.4*
Δ(W/Y) * p70-p89	MPC	0.027 ***	0.027 ***	0.012 **	0.013 *	0.034 ***	0.039 ***	0.026 ***	0.027 ***	0.041 **	0.043 **
	Std. Err.	(0.007)	(0.007)	(0.006)	(0.008)	(0.005)	(0.006)	(0.008)	(0.008)	(0.018)	(0.018)
	Fstat	*211.0*	*4.5*	*5.2*	*6.2*	*13.4*	*7.9*	*18.0*	*12.5*	*6.3*	*8.8*
	SW-Fstat	*154.6*	*6.0*	*5.5*	*6.8*	*14.2*	*16.3*	*19.9*	*14.3*	*9.2*	*13.7*
Δ(W/Y) * p90-p100	MPC	0.012 ***	0.015 ***	0.003	0.004 *	0.006 ***	0.006 ***	0.008 ***	0.011 ***	0.023 ***	0.024 ***
	Std. Err.	(0.003)	(0.004)	(0.002)	(0.002)	(0.001)	(0.002)	(0.003)	(0.004)	(0.006)	(0.006)
	Fstat	*32.7*	*2.6*	*22.1*	*27.3*	*50.8*	*60.7*	*3.2*	*2.0*	*7.8*	*5.4*
	SW-Fstat	*34.1*	*3.5*	*23.1*	*29.6*	*53.8*	*80.4*	*3.6*	*2.4*	*9.7*	*7.1*
Other controls		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of households		845	845	812	812	1,776	1,776	3,023	3,023	2,356	2,356

Accounting for changes in permanent income

- Consumption should also be affected by permanent income shocks
- No income spells to build a permanent income
- But, similarly to the SCF, the HFCS asks : **“would you say that your (household’s) income over the last 12 months was unusally high or low compared to what you would expect in a "normal" year, or was it about normal?”**

1. Following Carroll (2000): HH who reported “normal” both in wave 1 and in wave 2 (Note: this income may differ if they faced permanent income shocks in between).

2. Including permanent income : similar regression as before, but restricted to the subsample “normal” (because equation in difference)

Main results:

- **Wealth effects remain significant**
- Italy : still significant but lower MPC (2.8 cents compared to 4.6 cents), in line with Rodano and Rondinelli (2014): **severe permanent income shock in Italy** (in top of wealth shocks)

[Detailed results]

Other results

❑ **Heterogeneity depending on the type of shocks (gains/losses)**

- Transitory income shocks: Bunn et al. (2018), Christelis et al. (2017)

- Investigation only in countries where we observe both households facing losses and other ones with gains (CY, IT, ES, counterfactual wealth changes between wave 1 and wave 2)

⇒ **Confirms the decreasing patterns of MPC both for HH facing losses /gains**

⇒ **For Spain MPC out of losses>MPC out of gains**

❑ **Heterogeneity by non durable consumption expenditures (COICOP- 2 digits):**

⇒ **Significant MPC on most of the expenditures for all countries**

⇒ **Decreasing pattern along net wealth distribution**

⇒ **Higher MPC for the two main non durable expenditures** (Engel Curve)

(« Food and non alcoholic beverage », « housing, water, electricity, gas and other fuel »)

Table 7.b. Estimated MPC by category of consumption expenditure and by net wealth groups (IV estimates)

		Food and non-alcoholic beverages	Alcoholic beverages, tobacco and narcotics	Clothing and footwear	Housing, water, electricity, gas and other fuels	Furnishings, household equipment and routine household maintenance	Health	Transport
Belgium	p0-p49	0.0137 ***	0.0025	0.0002	0.0260 ***	0.0010	0.0031	0.0165
	p50-p69	0.0121 ***	0.0021 **	0.0047 ***	0.0331 ***	0.0087 ***	0.0053 *	0.0177
	p70-p89	0.0058 ***	0.0003	0.0022 *	0.0137 ***	0.0032	0.0022 **	0.0088 **
	p90-p100	0.0021 ***	0.0002	0.0010 **	0.0050 ***	0.0001	0.0004	0.0040 ***
Germany	p0-p49	0.0127 **	0.0021	0.0026 ***	0.0406 ***	0.0065	0.0014	-0.0005
	p50-p69	0.0107 ***	0.0020 *	0.0017	0.0353 ***	0.0007	-0.0034	0.0515
	p70-p89	0.0076 ***	0.0004	0.0037 ***	0.0296 ***	0.0060 ***	0.0018	0.0031
	p90-p100	0.0013 ***	0.0001 *	0.0002	0.0060 ***	0.0003 *	0.0004 ***	0.0028 *
Spain	p0-p49	0.0139 ***	0.0017 **	0.0042	0.0411 ***	0.0012	0.0049 *	0.0045
	p50-p69	0.0123 ***	0.0013 ***	0.0027 ***	0.0352 ***	0.0046 ***	0.0046	0.0037 **
	p70-p89	0.0053 ***	0.0005 *	0.0001	0.0168 ***	0.0011 **	0.0004	0.0024 *
	p90-p100	0.0023 ***	0.0003 ***	0.0005 ***	0.0045 ***	0.0002	0.0004 *	0.0008
Italy	p0-p49	0.0255 ***	0.0019	0.0022	0.0553 ***	0.0082	0.0088	0.0010
	p50-p69	0.0192 ***	0.0039 **	0.0029 *	0.0342 ***	0.0062	0.0053	0.0045
	p70-p89	0.0112 *	-0.0001	0.0069	0.0229 ***	0.0020	-0.0021	0.0063
	p90-p100	0.0111 ***	0.0015 **	0.0014 **	0.0098 ***	0.0017 **	0.0010	0.0029 ***

Table 7.b. (continued)

		Communication	Recreation and culture	Education	Restaurants and hotels	Miscellaneous goods and services	F-stats	SW F-stats	# obs
Belgium	p0-p49	0.0033 ***	0.0091 *	0.0003	0.0016	0.0096 ***	4.82	5.42	845
	p50-p69	0.0032 ***	0.0100 *	0.0006	0.0023	0.0107 ***	6.38	7.40	
	p70-p89	0.0018 ***	0.0053	0.0003	0.0010	0.0056 ***	4.47	5.98	
	p90-p100	0.0004 **	0.0008	0.0001	0.0009	0.0021 **	2.58	3.48	
Germany	p0-p49	0.0031 **	0.0104 *	-0.0004	0.0008	-0.0010	21.20	27.65	1,776
	p50-p69	0.0021 ***	0.0076 **	-0.0003	0.0021	0.0082 ***	5.35	11.60	
	p70-p89	0.0018 ***	0.0111 ***	0.0006 **	0.0033 ***	0.0061 ***	7.92	16.28	
	p90-p100	0.0003 ***	0.0014 ***	0.0000	0.0004	0.0006 *	60.73	80.35	
Spain	p0-p49	0.0017 **	0.0031 **	0.0002	0.0052 **	0.0046 ***	9.50	10.67	3,023
	p50-p69	0.0016 ***	0.0023 **	0.0006 **	0.0055 **	0.0074 ***	6.58	8.44	
	p70-p89	0.0012 *	0.0004	0.0001	0.0012 *	0.0023 ***	12.55	14.32	
	p90-p100	0.0003 ***	0.0003 **	0.0000	0.0004 **	0.0005	2.05	2.42	
Italy	p0-p49	0.0041 ***	0.0075 *	0.0002 *	0.0012	0.0068 **	8.79	9.80	2,356
	p50-p69	0.0020 *	0.0162 ***	0.0013	0.0024	0.0075 ***	16.32	25.43	
	p70-p89	0.0019 **	0.0186 ***	0.0003	0.0023 **	0.0088	8.76	13.72	
	p90-p100	0.0013 ***	0.0018 *	-0.0001	0.0000	0.0020 *	5.43	7.14	

Wealth inequality, heterogeneous MPC and consumption inequalities

- **Simple simulation exercice**: 10% increase in deposits, shares or housing assets

- **Without accounting for**: general equilibrium effects, nor changes in HH behaviours:

=>**Housing prices shock decreases consumption inequality** (excepted for DE)

$\Rightarrow$ **Financial wealth shocks: limited effects**

Deposits (-)

Shares (+), more concentrated at the top

And what about France?

- **Macro-based estimates**: limited but significant wealth effect on consumption (Slacalek, 2009; Chauvin and Damette, 2010)

- **Micro-based estimates**: **Waiting for the 2014-2017 panel of Enquête Patrimoine (Insee)!**

- Previous results based on the cross-section (Arrondel, Lamarche, Savignac, 2019):

- Decreasing MPC
- Role of institutional features : Differences in HH behaviour depending on the type of housing debt (« mortgages » > « crédits logements »)

- **Model based estimates**: Miguel's presentation!

Conclusion

- Based on the HFCS, we estimate **the marginal propensity to consume out of wealth** for countries where a **panel dataset** is available (BE, DE, IT, CY, ES)

- **Intrumental variable** approach

- **Significant wealth effect on consumption at the mean**. MPC less than one cent in DE to 5 cents in IT

- **Substantial heterogeneity within country**: decreasing MPC across the net wealth distribution, and heterogeneous effects of housing and financial assets.

APPENDIX

Consumption imputation

- Data sources for the auxiliary model: national consumption surveys providing the Eurostat-HBS survey

Country	Source Wave 1	Source Wave 2
BE	HBS 2010	HBS 2015
CY	HBS 2010	HBS 2010
DE	HBS 2008	HBS 2013
ES	HBS 2010	HBS 2015
IT	HBS 2010	HBS 2015

- We apply Browning et al. (2003), following Lamarche (2017):

- An auxiliary model is estimated on the HBS data, where log(non durable consumption) is explained by log(food expenses at home and outside home), log(rent), age, sex , education, employment status, household composition, and income quintile.

- We then apply a conditional hot-deck procedure with stratifications on households composition and tenure status.

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Disposable income imputation

- **Data sources** : survey on Income and living conditions (SILC – Eurostat)

We use the vintage of SILC corresponding to the income reference period in the HFCS.

Country	Source Wave 1	Source Wave 2
BE	SILC 2009	SILC 2013
CY	SILC 2009	SILC 2014
DE	SILC 2009	SILC 2013
ES	SILC 2007	SILC 2010
IT	SILC 2010	SILC 2014

- **Imputation**: we apply a rank hot-deck procedure on gross income (available both in SILC and in HFCS), stratified by household composition and occupation. As gross income is highly correlated with net income within country, the SILC disposable income is then imputed to an HFCS household based on its ranks in the gross income distribution (and on household composition and tenure status of the reference person).

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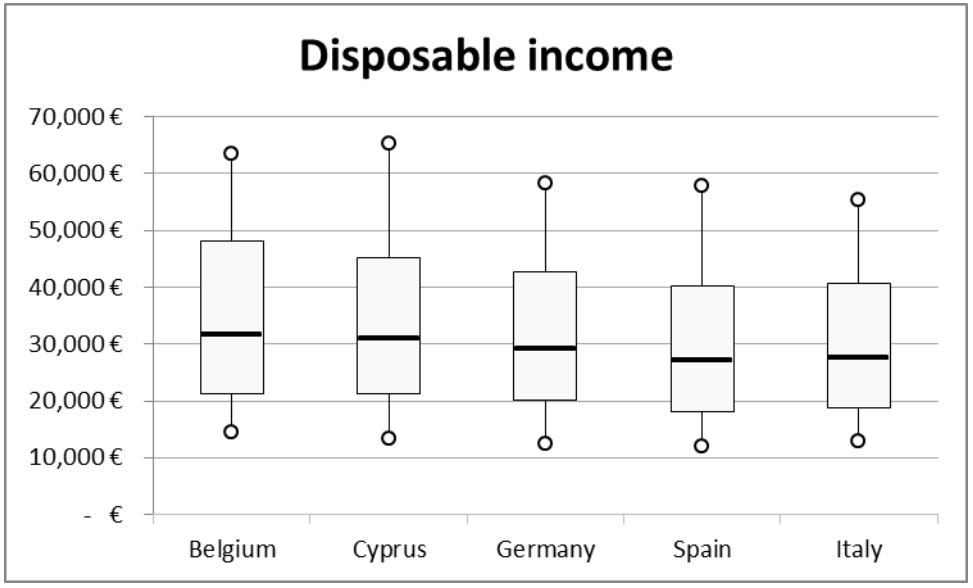
❑ Disposable income: heterogeneity across and within countries



Disposable income in wave 1.
Disposable income is imputed to HFCS households using the Survey on Income and Leaving Conditions (SILC-Eurostat)

❑ Instrumental variable (simulated portfolio)- 1/2

			HFCS variables	Prices index
DA1000	Total real assets =	+ DA1110	Value of household's main residence	Housing
		+ DA1120	Value of other real estate property	Housing
		+ DA1130	Value of household's vehicles	-
		+ DA1131	Valuables	-
		+ DA1140	Value of self-employment businesses	Bonds (non-financial corporations)
DA2100	Total financial assets =	+ DA2101	Deposits	Interest rate on deposits
		+ DA2102	Mutual funds, total	
			+ *HD1320A Equity*	Shares (domestic)
			+ *HD1320B Bonds*	Bonds (gov)
			+ *HD1320C Money market*	Bonds (gov)
			+ *HD1320D Real estate*	Housing
			+ *HD1320E Hedge funds*	Shares (domestic)
			+ *HD1320F Others*	Shares (domestic)
		+ DA2103	Bonds	
			+ *HD1410A Etats*	Bonds (gov)
			+ *HD141B Banques*	Bonds (financial corporations)
			+ *HD1410C Corporate*	Bonds (non-financial corporations)
			+ *HD1410D Others*	Bonds (non-financial corporations)
		+ DA2104	Value of non self-employment private business	Bonds (non-financial corporations)
		+ DA2105	Shares, publicly traded	
			+ *HD1510 Domestic companies*	Shares (domestic)
			+ *HD1520 Foreign companies*	Shares (world)
		+ DA2106	Managed accounts	Shares (domestic)
		+ DA2107	Money owed to households	-
		+ DA2108	Other assets	Shares (world)
		+ DA2109	Voluntary pension/whole life insurance	Shares (domestic)

❑ Instrumental variable (simulated portfolio) 2/2

Table. Price index sources

Country	Shares	Government Bonds	Deposits	Housing prices
BE	*BEL 20 - PRICE INDEX*	*FTSE GLOBAL GOVT. BG ALL MATS.(E) - CLEAN PRICE INDEX*	Bank interest rates - deposits from households - BE	House price index - BE
CY	*FTSE CYPRUS SE20 - PRICE INDEX*	*FTSE GLOBAL GOVT. EUROZONE ALL MATS.(E) - CLEAN PRICE INDEX*	Bank interest rates - deposits from households -CY	House price index - CY
DE	*DAX 30 PERFORMANCE - PRICE INDEX*	*FTSE GLOBAL GOVT. BD ALL MATS.(E) - CLEAN PRICE INDEX*	Bank interest rates - deposits from households- DE	House price index - DE
ES	*IBEX 35 - PRICE INDEX*	*FTSE GLOBAL GOVT. ES ALL MATS.(E) - CLEAN PRICE INDEX*	Bank interest rates - deposits from households- ES	House price index - ES
IT	*FTSE MIB INDEX - PRICE INDEX*	*FTSE GLOBAL GOVT. IT ALL MATS.(E) - CLEAN PRICE INDEX*	Bank interest rates - deposits from households - IT	House price index - IT
World	*FTSE ALL WORLD E - PRICE INDEX*	-		
Source	Datastream	Datastream	ECB (sdw)	Eurostat

	Bonds corporate
ALL	*FTSE EURO CORP. ALL MATURITIES - CLEAN PRICE INDEX*
NON FIN	*FTSE EURO CORP. NON FINANCIALS - CLEAN PRICE INDEX*
FIN	*FTSE EURO CORP. FINANCIALS - CLEAN PRICE INDEX*
Source	*Datastream*

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Distribution of counterfactual gains/losses in wealth

Percentiles	Belgium			Cyprus			Germany			Spain			Italy		
	All	Low-wealth	High-wealth	All	Low-wealth	High-wealth	All	Low-wealth	High-wealth	All	Low-wealth	High-wealth	All	Low-wealth	High-wealth
p1	0.1	0.0	5.8	-47.9	-55.7	-32.5	0.2	0.0	7.0	-24.3	-23.6	-26.3	-11.9	-11.9	-11.9
P5	4.6	2.5	6.5	-23.9	-24.3	-21.5	2.0	1.0	8.1	-22.7	-22.6	-23.0	-11.6	-11.6	-11.6
P10	6.4	6.0	6.9	-16.7	-17.3	-15.6	5.2	3.4	8.8	-22.5	-22.5	-22.6	-11.4	-11.3	-11.4
P25	7.0	6.9	7.4	-11.5	-11.5	-11.3	8.3	6.3	9.8	-21.9	-21.9	-21.9	-10.7	-10.6	-10.8
P50	7.8	7.6	8.2	-9.8	-9.7	-9.8	10.5	10.0	11.7	-20.5	-20.5	-20.6	-9.1	-8.3	-9.8
P75	9.2	8.8	9.7	-6.6	-5.9	-7.3	16.8	17.4	15.7	-16.5	-17.0	-15.6	-1.1	0.8	-8.1
P90	11.0	11.2	10.8	0.1	0.8	-1.5	25.8	27.8	21.0	-6.5	0.0	-9.9	3.4	4.6	-4.8
P95	12.0	12.1	11.8	3.8	9.5	2.2	32.2	35.5	24.3	1.8	4.4	-6.3	5.6	6.5	-2.6
P99	14.4	14.1	23.0	14.7	15.1	4.1	46.3	47.3	33.7	8.3	8.3	3.2	8.9	9.1	2.7
Min	0.0	0.0	3.3	-77.4	-77.4	-76.8	0.0	0.0	0.1	-33.6	-33.6	-30.8	-11.9	-11.9	-11.9
Max	27.9	27.9	25.6	16.3	16.3	5.3	48.4	48.4	46.1	8.3	8.3	8.0	15.2	15.2	5.8
Mean	8.1	7.8	8.8	-9.6	-9.5	-9.6	13.4	13.4	13.5	-17.4	-17.1	-18.1	-6.2	-5.0	-8.9
Std	2.6	2.6	2.5	9.7	11.3	6.8	9.1	10.2	5.7	7.5	8.2	5.9	5.9	6.5	3.0
#observations	845	506	339	812	417	395	1,776	942	834.0	3,023	1,502	1,521	2,356	1,486	870

Counterfactual gains/losses computed from household level wealth composition in wave 1 and using the aggregate price developments between wave 1 and wave 2 displayed in Table 1. The percentages account for country-specific inflation developments between wave 1 and wave 2.
"High-wealth": households whose net wealth is equal or above the 70th percentile.
"Low-wealth": households whose net below the 70th percentile.

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Table 6. Robustness: accounting for permanent income shocks

			Robustness: subsample with permanent income					Results without accounting for permanent income shocks (full sample)
Specification			**Belgium**	**Cyprus**	**Germany**	**Spain**	**Italy**	
Baseline Model IV- 8 intr.	Total gross wealth	**MPC**	**0.031** ***	**0.006** ***	**0.011** ***	**0.020** ***	**0.028** ***	Table 3 - column 3
		Std. Err.	0.007	0.002	0.004	0.006	0.004	
		Fstat	*22.3*	*45.0*	*33.9*	*15.8*	*90.9*	
Housing and Financial wealth- IV - 8 instr.	Housing wealth	**MPC**	**0.048** ***	**0.004** ***	**0.008**	**0.030** ***	**0.028** ***	Table 4
		Std. Err.	0.014	0.002	0.006	0.005	0.005	
		Fstat	*28.2*	*45.3*	*9.2*	*19.5*	*71.7*	
		SW Fstat	*2.4*	*43.2*	*2.2*	*22.0*	*34.1*	
	Financial wealth	**MPC**	**0.009**	**0.062** ***	**0.042** **	**0.015**	**0.076** *	
		Std. Err.	0.010	0.015	0.018	0.018	0.040	
		Fstat	*11.7*	*23.7*	*5.6*	*2.8*	*3.5*	
		SW Fstat	*7.6*	*37.8*	*2.5*	*3.3*	*3.9*	
Number of households			600	275	775	1051	1610	

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Table 8. Simulation exercise: price shock on wealth and consumption inequalities

		Before shock (euros)		After shock (%) With a 10% increase in					
				Deposits		Shares		Housing wealth	
		Consumption	Net wealth	Consumption	Net wealth	Consumption	Net wealth	Consumption	Net wealth
Belgium	Mean	27,959	394,124	0.59%	1.22%	0.05%	0.17%	4.07%	6.97%
	Median	25,092	261,663	0.54%	2.48%	0.00%	0.00%	5.07%	10.26%
	Share Top10/Share B50	0.72	2.67	-1.73%	-0.85%	-0.06%	0.32%	-3.55%	-6.18%
	Gini	0.28	0.54	-0.41%	0.09%	-0.05%	0.09%	-2.55%	-1.42%
	Theil	0.15	0.89	-0.95%	1.43%	-0.10%	0.51%	-5.92%	-5.01%
	Mean Top10/Mean B50	3.62	13.40	-0.43%	-0.25%	-0.06%	0.32%	-3.46%	-3.42%
Cyprus	Mean	27,718	722,385	0.17%	0.42%	0.03%	0.12%	3.29%	7.89%
	Median	24,179	326,477	0.28%	0.00%	0.00%	0.01%	4.02%	11.98%
	Share Top10/Share B50	0.79	5.47	0.16%	-0.32%	0.00%	0.04%	-3.10%	-5.33%
	Gini	0.31	0.65	-0.11%	-0.08%	0.00%	0.01%	-2.47%	-1.07%
	Theil	0.18	1.55	-0.27%	-0.22%	0.02%	-0.01%	-5.38%	-4.05%
	Mean Top10/Mean B50	4.03	28.06	-0.11%	-0.37%	0.00%	0.04%	-3.24%	-4.57%
Germany	Mean	24,644	244,307	0.27%	1.00%	0.03%	0.19%	1.52%	7.27%
	Median	21,246	80,400	0.27%	2.74%	0.00%	0.75%	1.19%	10.95%
	Share Top10/Share B50	0.75	12.98	-0.06%	-2.75%	0.15%	-0.01%	-1.22%	-3.16%
	Gini	0.29	0.73	-0.21%	-0.34%	0.00%	0.01%	-0.70%	-0.52%
	Theil	0.18	4.50	-0.49%	-1.65%	0.00%	-0.13%	-1.93%	-2.89%
	Mean Top10/Mean B50	3.77	65.17	-0.23%	-3.12%	0.04%	0.02%	-0.81%	-2.70%
Spain	Mean	21,456	310,424	0.28%	0.63%	0.02%	0.08%	4.36%	8.70%
	Median	18,659	200,375	0.44%	0.81%	0.00%	0.00%	4.71%	10.68%
	Share Top10/Share B50	0.84	2.64	-0.25%	-0.30%	0.02%	0.07%	-4.79%	-5.02%
	Gini	0.32	0.54	-0.18%	-0.04%	0.00%	0.03%	-3.53%	-1.62%
	Theil	0.20	1.12	-0.42%	-0.22%	0.01%	0.27%	-7.09%	-4.90%
	Mean Top10/Mean B50	4.23	13.21	-0.29%	-0.15%	-0.01%	0.13%	-4.81%	-4.95%
Italy	Mean	23,058	263,050	0.27%	0.48%	0.02%	0.04%	4.06%	8.08%
	Median	19,383	187,093	0.47%	0.50%	0.00%	0.00%	6.42%	8.37%
	Share Top10/Share B50	0.84	3.09	0.24%	-0.94%	-0.01%	0.01%	-3.21%	-0.80%
	Gini	0.32	0.56	-0.18%	-0.16%	-0.01%	0.01%	-2.99%	-0.19%
	Theil	0.20	0.95	-0.37%	-0.60%	-0.01%	0.01%	-6.13%	-2.81%
	Mean Top10/Mean B50	4.24	15.48	-0.08%	-0.45%	-0.01%	0.01%	-3.88%	-0.58%