

Guerrieri, Cinzia; Mendicino, Caterina

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Wealth effects in the euro area

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Abstract

How sizable is the wealth effect on consumption in euro area countries? To address this question, we use newly available harmonized euro area wealth data and the methodology in Carroll et al. (2011b). We find that the marginal propensity to consume out of total wealth averaged across the largest euro area economies is around 3 cents per euro, with a marginal propensity to consume out of financial wealth significantly larger than of housing wealth. Country-group estimates document no significant differences between the largest economies and the rest of the sample. In contrast, remarkable differences emerge between periphery and core countries.

JEL codes: C22, E21, E32, E44

Keywords: households wealth, financial assets, consumption dynamics, wealth effects

Non-technical summary

Movements in asset prices affect the real economy through a variety of channels. One of the most studied is the wealth channel, according to which consumption is affected by changes in households' assets value, such as stocks, bonds and real estate. Anecdotal evidence shows that larger household wealth is correlated with higher consumption spending. However, the literature presents mixed evidence on the magnitude of the marginal propensity to consume out of total wealth across countries, with estimates ranging from 4 to 5 cents per dollar for Anglo-Saxon countries to often small or not significant in other advanced economies, such as the euro area countries. One of the reasons for the lack of systematic cross-country comparison is the inadequacy of standardized wealth data across economies.

This paper reviews the empirical relationships between wealth and consumption growth for a number of euro area countries using newly available quarterly Household Sector Report data from 1999Q1 to 2017Q2. We follow the econometric methodology proposed by Carroll et al. (2011b) in order to investigate the wealth effects in terms of its two key aspects, i.e. the “speed” through which consumption responds to shocks and the “strength” of the wealth impact.

This paper investigates (i) whether and to which extent changes in wealth alter the spending behavior of households; (ii) which are the assets that have a major impact on consumption; and (iii) the magnitude of the wealth effects nowadays compare to the pre-crisis period. The main findings are as follows:

- the persistence of consumption growth is equal to 0.7 on average across the five largest euro area countries (i.e. Germany, France, Italy, Spain and the Netherlands) and in line with international evidence on consumption growth stickiness;
- the marginal propensity to consume out of total wealth averaged across the Big 5 is around 3 cents per euro and, thus, somewhat lower than what reported in the literature for Anglo-Saxon countries;
- financial wealth effects are significantly larger than housing wealth effects;
- heterogeneity points towards large and significant effects for France, Italy and Spain, while not significant for the Netherlands and Germany;
- the high degree of heterogeneity across countries is reflected in the marginal propensity to consume out of the sub-components of financial wealth.

Last, we extend the analysis to a larger number of countries (including Austria, Belgium, Finland and Portugal), and group them in (i) Big 5 vs the remaining countries and (ii) core vs periphery. Panel estimates highlight no large differences in terms of wealth effect on consumption for the Big 5 and the

rest of the countries. In contrast, the difference in the marginal propensity to consume out of wealth is marked between periphery and core countries, and even more sizable is the difference in terms of the marginal propensity to consume out of financial wealth.

Overall, our analysis provides to the policy makers new insights about the potential macroeconomic implications of changes in financial and non-financial asset prices on households' consumption.

1 Introduction

Movements in asset prices affect the real economy through a variety of channels. One of the most studied is the wealth channel, according to which consumption is affected by changes in households' assets value, such as stocks, bonds and real estate. Anecdotal evidence shows that larger household wealth is correlated with higher consumption spending. However, the literature presents mixed evidence on the magnitude of the marginal propensity to consume out of total wealth across countries, with estimates ranging from 4 to 5 cents per dollar for Anglo-Saxon countries to often small or not significant in other advanced economies, such as the euro area countries.¹ One of the reasons for the lack of systematic cross-country comparison is the inadequacy of standardized wealth data across countries.

This paper reviews the empirical relationship between wealth and consumption growth for a number of euro area countries. Specifically, we aim to address the following questions: (i) whether and to which extent changes in wealth alter the spending behavior of households; (ii) which are the assets that have a major impact on consumption; and (iii) the magnitude of the wealth effects nowadays compare to the pre-crisis period.

Compared to existing works, this paper benefits from more recent and standardized wealth data across several euro area countries. We use the newly available quarterly Household Sector Report data from 1999Q1 to 2017Q2 and follow the econometric methodology proposed by Carroll et al. (2011b), in order to investigate the wealth effects in terms of its two key aspects, i.e. the “speed” through which consumption responds to shocks and the “strength” of the wealth impact. This approach is based on some recent theoretical works that demonstrate that the consumption growth is persistent over time (see for instance Carroll et al. (2018)), in contrast to the standard random walk model by Hall (1978). The main implication is that the initial impulse response of consumption to wealth shocks is smaller than the one implied by the permanent income hypothesis, but it is increasing over time. In other terms, a change of wealth has a slow but long-lasting impact on consumption, implying that the “eventual” effect (after some years) is larger than the “immediate” one (next quarter).²

In practice, we measure the wealth effects by applying a three-step approach. First, we estimate the sluggishness of aggregate consumption growth across countries by using an IV regression analysis, which helps mitigate some limits of the OLS estimates (i.e. biasness towards zero) that arise when working with quarterly consumption data. Second, we estimate the immediate wealth effects on consumption,

¹See, among others, Catte et al. (2004), Ludwig and Slok (2004), Case et al. (2005), Cardarelli et al. (2008) and Slacalek (2009).

²We follow the same definitions as in Carroll et al. (2011b) to refer to the short- and medium-run marginal propensity to consume out of wealth.

where wealth is defined as the geometric sum of its past values and the weights are given by the degree of consumption growth persistence estimated in the first step. Finally, we use the estimated consumption growth sluggishness and the immediate marginal propensity to consume out of wealth to construct a measure of eventual effect.

We contribute to the empirical literature in several ways. First, the recently standardized Household Sector Report data allows us to obtain more reliable estimates of the wealth effects on consumption for 9 euro area countries, both at country- and group-level. Second, in addition to total household wealth, we investigate the effects of disaggregate wealth by considering: (i) housing and financial wealth; and (ii) the split of financial wealth into its three major sub-components (i.e. currency and deposits, debt securities, and equities). To the best of our knowledge, we are the first to examine the relative importance of several types of financial and non-financial assets - which in turn reflect changes in the corresponding prices - affecting households' spending decisions across euro area countries.³ Last, the time span we consider is longer than those in previous studies, which permits to provide up-to-date estimates that encompass the double-dip recession. In a robustness exercise, we restrict the dataset to 2010 in order to compare the full sample effect of wealth on consumption dynamics with the effect before the sovereign debt crisis. Overall, our analysis provides to the policy makers new insights about the potential macroeconomic implications of changes in financial and non-financial asset prices on households' consumption.

The main findings are as follows. We start by examining in detail the wealth effects for the five largest euro area economies (Big 5) separately, i.e. Germany, France, Italy, Spain and the Netherlands, and we find that the persistence of consumption growth is equal to 0.7 on average, consistent with the recent literature for advanced economies (e.g., Carroll et al. (2011a)). Second, the average marginal propensity to consume out of total wealth is around 3 cents per euro, only slightly below what reported in the literature for Anglo-Saxon countries⁴. Third, our results document a significant degree of heterogeneity across countries at disaggregate level.

We then compare our results with the rest of the euro area countries for which we were able to collect consistent and comparable wealth data from the Household Sector Report, i.e. Austria, Belgium, Finland and Portugal. In particular, we explore the heterogeneity for various groups, namely Big 5 vs

³Slacalek (2009) investigates the cross-country heterogeneity of housing and financial wealth effects using the methodology in Carroll et al. (2011b) and data for 16 industrialized countries since the early 1970's to the early 2000's. His measure of housing wealth is constructed by using house prices and dwelling stocks. Also Sousa (2009) follows the approach by Carroll et al. (2011b) and estimates the wealth effects on consumption, both at the aggregate and disaggregate level, for the euro area as a whole for the period 1980-2007.

⁴Christelis et al. (2015) estimate broadly comparable MPCs out of financial and housing wealth shocks in the US during the Great Recession.

rest of the sample, core vs periphery countries.⁵ Panel estimates highlight no large differences in terms of wealth effect on consumption for the Big 5 and the rest of the euro area countries. In contrast, the difference in the marginal propensity to consume out of wealth is marked between periphery and core countries; even more sizable is the difference in terms of the marginal propensity to consume out of financial wealth.

The remainder of the paper is organized as follows. Section 2 illustrates a simple theory of persistence of consumption growth. Section 3 describes the methodology and the dataset, and Section 4 presents the estimation results. Section 5 concludes. The Appendix provides details on the data used in this paper.

2 The Sticky Expectations Model

In this section we introduce a simple model of persistence of consumption growth, which constitutes the basis of the approach we follow for the wealth effects estimation. As argued by Carroll et al. (2011b) « if there is a reliable degree of stickiness in consumption growth, an estimation method that relies upon that stickiness to estimate wealth effects using high- and medium-frequency data is less likely to be led astray by a “regime change” than a full-sample estimation technique like cointegration estimation.»

One of the most popular theoretical frameworks used to illustrate the presence of serial correlation in aggregate consumption growth is the “sticky information model” proposed by Carroll et al. (2018).⁶ The authors argue that consumption sluggishness may arise when households are mildly *inattentive* to macroeconomic developments and consequently do not fully and immediately update their information set in response to macro news.

Let’s consider an economy where consumers maximize the discounted sum of time-separable utility streams⁷:

$$\max \mathbb{E} \sum_{t=s}^{\infty} \beta^{t-s} U(C_t) \quad (1)$$

subject to budget constraint:

$$B_{t+1} = (B_t - C_t)R + Y_{t+1} \quad (2)$$

where β is the discount factor, C is the consumption level, B is the beginning-of-period net assets,

⁵Core countries: Austria, Belgium, Germany, Finland, France, Netherlands. Non-core countries: Italy, Spain, Portugal.

⁶An alternative theory is represented by the “habit formation model” suggested by Muellbauer (1988) and Dynan (2000), in which the serial correlation coefficient reflects the strength of habits. The implications of this framework are the same as in Carroll et al. (2018) when applied to aggregate data. Please refer to Carroll et al. (2011a) for further discussion.

⁷Contrarily, the habit formation model is based on time-nonseparable utility.

R is the constant interest factor, and Y is noncapital income. In its benchmark quadratic utility model, Hall (1978) shows that the optimal consumption level in a frictionless expectations economy⁸ follows a random walk and thereof the consumption growth is a white noise, $\Delta C_t = \varepsilon_t$.⁹ Put differently, the household's consumption growth is not predictable.

On the contrary, Carroll et al. (2018) assume that consumers update their information, and therefore their behavior, only occasionally. In other words, they simulate an economy consisting of a continuum of *inattentive* time-separable constant relative risk aversion (CRRA)-utility consumers, each of whom updates the information about aggregate permanent income with probability Π in each period. Similarly to the Calvo (1983) model for firms' price setting, their model assumes that this probability does not depend on the timing of the updates and on the level of income (or wealth). The authors show that the change in the log of aggregate consumption, $\Delta \log C_t$, approximately follows an autoregressive AR(1) process, whose autocorrelation coefficient approximates the share of consumers $(1 - \Pi)$ who do not have up-to-date information about macroeconomic developments:¹⁰

$$\Delta \log C_t = \mu + \underbrace{(1 - \Pi)}_{\equiv \chi} \Delta \log C_{t-1} + \varepsilon_t \quad (3)$$

where $\Delta \log C_t$ represents the consumption growth, χ is a parameter that captures the persistence of consumption growth, μ is a constant and ε stands for the error term. This result is more consistent with the literature arguing that the random walk model is not suitable for representing the actual dynamics of aggregate consumption (see, *inter alia*, Flavin (1981), Campbell and Deaton (1989) and Campbell and Mankiw (1989)). Indeed, several empirical works have showed the so-called “excess sensitivity puzzle”, i.e. that future consumption growth is likely to be significantly affected by past variables. For example, Sommer (2007) and Carroll et al. (2011a) find that past consumption growth is the strongest predictor of current consumption growth for US and thirteen advanced economies, respectively.¹¹

⁸Based on the assumption that households take into account the full information released through aggregate macroeconomic news

⁹The same conclusion holds with CRRA-utility consumers and perfect foresight.

¹⁰The habit formation model leads to the same result, where $(1 - \Pi) \equiv \chi$ should be interpreted as the strength of habits. Also the “rational inattention” model by Reis (2006) yields to a similar consumption dynamics.

¹¹Sommer (2007) and Carroll et al. (2011a) estimate a slight version of Equation 3, where they both include income growth to test for the rule-of-thumb behavior. In addition, the former also includes consumer sentiment, while the latter control for households' assets as proxy for precautionary savings and liquidity constraints. Both papers provide estimates from univariate regressions (one regressor at time) and with all regressors included. Overall, their results strongly suggest that past consumption growth is by far the strongest predictor of current consumption growth.

3 Methodology and Dataset

3.1 Methodology

In this section we present the econometric methodology recently proposed by Carroll et al. (2011b) for the estimation of wealth effects on consumption.¹² First, we need to identify the contribution of a change in wealth. To this purpose, we decompose the consumption shock ε_t in Equation 3 between wealth shocks ∂W_t and a vector of control variables Z_t :

$$\varepsilon_t = \beta \partial W_t + \gamma^\top Z_t \quad (4)$$

where $\partial W_t = \frac{\Delta W_t}{C_{t-1}} = \frac{\Delta W_t}{W_{t-1}} \times \frac{W_{t-1}}{C_{t-1}}$ denotes the rescaled wealth growth, such that β can be interpreted as the “initial” (current quarter) marginal propensity to consume out of wealth, instead of a relationship between the growth rate of wealth and the growth rate of consumption. Equation 3 can be rewritten in terms of its moving average representation form:

$$\Delta \log C_t = \alpha + \sum_{i=1}^{\infty} \chi^i \varepsilon_{t-i} + \varepsilon_t \quad (5)$$

with $\alpha = \mu/(1 - \chi)$. Substituting 4 into 5 gives:

$$\Delta \log C_t = \alpha + \beta \sum_{i=1}^{\infty} \chi^i \partial W_{t-i} + \gamma^\top \sum_{i=1}^{\infty} \chi^i Z_{t-i} + \varepsilon_t \quad (6)$$

or

$$\Delta \log C_t = \alpha + \beta \chi \bar{\partial} W_{t-1} + \tilde{\gamma}^\top \tilde{Z}_{t-1} + \varepsilon_t \quad (7)$$

where $\bar{\partial} W_{t-1} \equiv \sum_{i=1}^{\infty} \chi^{i-1} \partial W_{t-i}$, $\tilde{\gamma}^\top = (\gamma^\top \chi, \gamma^\top \chi^2, \dots)$ and $\tilde{Z}_{t-1}^\top = (Z_{t-1}^\top, Z_{t-2}^\top, \dots)$.

To estimate Equation 7 we approximate the infinite sum $\bar{\partial} W_{t-1}$ with a finite one, $\bar{\partial} W_{t-1} \approx (\Delta W_{t-1} + \chi \Delta W_{t-2} + \chi^2 \Delta W_{t-3} + \chi^3 \Delta W_{t-4})/C_{t-5}$. Consistently, we rescale consumption with the same initial consumption level C_{t-5} .¹³ In other terms, we estimate the following equation:

$$\partial C_t = \alpha + \tilde{\beta} \bar{\partial} W_{t-1} + \tilde{\gamma}^\top \tilde{Z}_{t-1} + \varepsilon_t \quad (8)$$

where $\tilde{\beta} \equiv \beta \chi$ provides a direct estimate of the marginal propensity to consume in quarter t out of a change in wealth in quarter $t - 1$, $\partial C_t \equiv \Delta C_t/C_{t-5}$ and $\bar{\partial} W_{t-1} = (\Delta W_{t-1} + \chi \Delta W_{t-2} + \chi^2 \Delta W_{t-3} +$

¹²The conventional estimation approach imposes cointegration between consumption, wealth and income. See the pioneer work by Lettau and Ludvigson (2004).

¹³Given that $\bar{\partial} W_{t-1}$ is a weighted average of past values up to one year, the initial level corresponds to five quarters before current quarter.

$\chi^3 \Delta W_{t-4})/C_{t-5}$.¹⁴

We follow the definition as in Carroll et al. (2011b) and refer to $\tilde{\beta}$ as the “immediate” (next quarter) wealth effect. Indeed, wealth in our source (the ECB quarterly sector account) is measured at a point in time (on the last day of the quarter), while consumption is measured continuously over the quarter. Therefore, the information on wealth is revealed to the consumer only later in the quarter. Given the estimates of χ and $\tilde{\beta}$, we define the immediate (next quarter) and eventual (after some years) marginal propensity to consume out of wealth respectively as:

$$\text{MPC}_w^{\text{im}} = \tilde{\beta} \quad (9)$$

$$\text{MPC}_w^{\text{ev}} = \beta \sum_{i=0}^{\infty} \chi^i = \frac{\tilde{\beta}}{\chi(1-\chi)} \quad (10)$$

To sum up, the estimation procedure follows three steps: (i) estimate the degree of stickiness in consumption growth in Equation 3; (ii) estimate the immediate marginal propensity to consume in the current quarter out of a change in wealth in the previous quarter from Equation 8; (iii) given the immediate MPC out of wealth and the degree of stickiness in consumption growth, construct a measure of eventual effect on the level of consumption from a unit innovation to wealth.

3.2 Households Wealth Data

The analysis presented in this paper is based on the use of quarterly households wealth data over the period 1999Q1-2017Q2 from the latest vintage of the euro area Household Sector Report reports for nine euro area countries: Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Portugal and Spain.¹⁵ The newly available standardized households wealth data allow us to overcome the lack of systematic cross-country comparison in the literature of wealth effects in the euro area. In addition, the report provides comparable series for several types of financial and non-financial assets, which allows us to disentangle the marginal propensity to consume out of wealth in its main components.

Specifically, we consider both aggregate and disaggregate measures of household wealth. Net total wealth is defined as the sum of total financial assets and housing wealth net of total financial liabilities.

¹⁴ Although ∂C_t is not equal to consumption growth $\Delta C_t/C_{t-1} \approx \Delta \log C_t$, the two variables are almost perfectly correlated as C_t is $I(1)$ and therefore C_t and C_{t-1} are very similar.

¹⁵ In December 2015 the ECB has published the new statistical report on the Household Sector in response to the increasing demand for detailed data on the household sector and its central role in the economy. Although it compares the entire household sector across the euro area, the report does not contain distributional information referring to individual households or groups of households. For more information, please refer to the official website: <https://www.ecb.europa.eu/press/pr/date/2015/html/pr151110.en.html> For the nine countries listed in the main text we could collect consistent and comparable series over time. The data are available from the Quarterly Financial and Non-Financial Sector Accounts - ESA 2010.

Net financial wealth is defined as the difference between financial assets and liabilities (excluding mortgage loans), whereas net housing wealth is considered as net of mortgage loans. In addition, we also explore the relative importance of different types of financial assets. In fact, changes in financial wealth value reflect changes in a variety of asset prices. Therefore, we split net financial wealth in its major sub-components, namely: (i) currency and deposits; (ii) net debt securities; (iii) net equity.¹⁶

Figure 1 shows the evolution of total wealth and its two major components, financial and housing wealth, for each country in our sample for the period 1999Q1-2017Q2¹⁷: total wealth grows by about 2.2% a year on average across all countries, reflecting about 2.5% and 2% of housing and financial wealth growth, respectively. In particular, the annual housing growth rate is the highest in France (almost 5% on average) and the lowest in Portugal (around 0.8% on average); regarding the annual growth rate of financial wealth, Italy registers the lowest value (0.6% on average) while Finland the highest (3.7% on average).

Figure 2 plots the total personal consumption growth against wealth growth multiplied by the wealth-consumption ratio between 1999Q1 and 2017Q2.¹⁸ We also report the slope of the regression line, which suggests that about 4,5 cents are consumed from an additional euro of wealth. Figure 3 display similar plots for the disaggregate wealth: the estimated MPC is about 9 and 7 cents for financial and housing wealth, respectively.

Table 1 (Panel A) documents that on average the shares of financial and housing wealth are similar. However, while housing is systematically larger than financial wealth for Austria, France, Italy, Portugal and Spain, the reverse holds for the remaining countries. The decomposition of financial wealth into assets categories also reveals interesting heterogeneity (Panel B of Table 1). On average the three categories of assets considered in the analysis, i.e. currency and deposits, debt securities and equity represent a similar fraction of total financial wealth. However, households in periphery countries and Finland hold a larger share of currency and deposits and equity, whereas the share of debt securities is larger than the other

¹⁶Most of “currency and deposits” are deposits with banks, although in some countries the central government is also a deposit-taker (like in the case of the post office). In the latter case, these are also included. All sorts of deposits, irrespective of maturity, are included. “Debt securities” instead includes mainly government debt securities held directly by households, that is, not via investment funds, pension schemes or life insurance schemes. Direct holdings of bank and corporate debt securities are also included. In addition, we also include holding of debt securities (mainly corporate debt securities) that take place via investment funds. The EA accounts distinguish between direct holding of debt securities and claims on pension schemes (excluding social security pensions) and life insurance. “Equity” comprises the sum of quoted and unquoted shares, money market fund shares and investment fund shares schemes.

¹⁷Unless explicitly stated, wealth data are defined in “net” terms.

¹⁸The growth rate of wealth is multiplied by the wealth-consumption ratio so that the slope of the regression line can be interpreted as the marginal propensity to consume out of wealth.

two components in the remaining countries.

4 Estimation

In this section we discuss in detail the consumption sluggishness results and the wealth effects on consumption for the five largest euro area countries (Germany, France, Italy, Spain and Netherlands). We conclude the discussion with panel estimation results obtained using the extended dataset that include also a number of other euro area economies (Austria, Belgium, Finland and Portugal) for which we were able to collect consistent and comparable wealth data from the Household Sector Report. All results refer to the time period 1999Q1-2017Q2.

4.1 Estimates of Consumption Growth Sluggishness

We first provide estimates of the degree of consumption growth stickiness for the five largest euro area countries. For the purpose of our analysis, we use total personal consumption expenditure, so that we can investigate whether and the extent to which a unit innovation of wealth has an effect on aggregate demand.¹⁹

To get an unbiased and consistent estimate of χ in Equation 8, we follow the standard approach based on IV regression. In fact, there are at least three reasons to expect the OLS estimate to be inconsistent and biased towards zero²⁰: (i) quarterly consumption data may contain substantial measurement error (Wilcox (1992), Bureau of Economic Analysis (2006) and Sommer (2007)); (ii) existence of large transitory fluctuations in consumption not included in the theory (e.g. related to unusual weather); (iii) time aggregation bias.²¹

In order to address these three estimation issues in quarterly consumption data, we follow the econometric method developed by Sommer (2007), which consists of estimating Equation 3 with instrumental variables dated $t - 2$. This approach only requires that the instruments are correlated with next-period consumption growth and uncorrelated with the measurement error. Our baseline instrument

¹⁹Results are robust to a measure of non-durables consumption, constructed as difference between total consumption and durables. However, total consumption expenditure is our preferred measure for two main reasons: (i) it can be considered the variable of interest for investigating the link between consumption and wealth, as pointed out by Mehra (2001); (ii) it is not possible to construct a measure of non-durables consumption for all countries in the extended dataset used for the panel estimations.

²⁰Please refer to Carroll et al. (2011a) for a deeper discussion of the relevance of these issues on US data.

²¹As shown by Muellbauer (1988) and Sommer (2007), in a simple habit formation or sticky information model, time aggregation causes a moving average MA(2) process in consumption growth, but the MA(2) coefficient is generally negligible.

set for the IV regressions consists of variables that are strongly correlated with consumption growth: the growth rate of total wealth and disposable income, the growth rate of stock prices, the change in unemployment rate, and interest rate spread.²² Consumption, income and wealth were deflated with consumption deflators and express in per capita terms.

Table 2 shows the baseline estimation results. The average χ in the five largest EA countries is 0.7 with an average standard deviation of 0.27, implying that the persistence of consumption growth is statistically significantly different from zero. Panel C and D display the p-value testing $\chi = 0$ with the Moreira (2003) conditional likelihood ratio statistic (CLR) for weak instruments²³ and the adjusted $\bar{R}^2$ from the first-stage regressions. The null hypothesis is clearly rejected for all countries, although for Germany the $\bar{R}^2$ is quite small. Our estimates are in line with the findings of Carroll et al. (2011a), which provide international evidence for the stickiness in aggregate consumption growth for thirteen advanced economies. Using both instrumental variables and Kalman Filter structural estimations, they document that the estimates of χ for the five largest EA economies are 0.66 and 0.918 on average, respectively. Carroll et al. (2011b) estimate the degree of consumption sluggishness in US to be around 0.73 using the same set of instrumental variables.²⁴ Finally, our results support the conclusion of the sticky expectations model presented in the previous section and provide a strong rejection of the random walk theory, according to which the persistence of consumption growth is null.

4.2 Country-Specific Wealth Effects

We estimate Equation 8 separately for Germany, France, Italy, Spain and the Netherlands using ordinary least squares with Newey-West correction of standard errors. The results are robust to a change in the maximum number of lags, here fixed to be 4. We consider three definitions for wealth, W : aggregate net wealth, net financial wealth and net housing wealth. Finally, we also estimate the wealth effects of changes in the main sub-components of financial wealth.²⁵

The set of control variables, Z , consists of: the growth rate of disposable income, the unemployment rate, the interest rate spread, the change in the short-term interest rate and the consumer sentiment.

²²We use the same set of instruments as in Carroll et al. (2011b) for US. The growth rates of wealth and disposable income are defined consistently with the consumption growth as $\frac{\Delta W_t}{C_{t-1}}$ and $\frac{\Delta Y_t}{C_{t-1}}$, respectively. The interest rate spread is defined as difference between the interest rate for house purchases and a measure of risk-free rate. Please see the Appendix A.1 for a detailed description. The series are seasonally adjusted using the X-12 method when necessary.

²³See Andrews et al. (2006) for a proof of powerful CLR test.

²⁴Using another set of instruments (i.e. wealth growth, nominal federal funds rate and Michigan University unemployment expectations) the authors find a similar value too.

²⁵See section 3.2 for the definition of the various wealth concepts.

By including these variables, we filter out some endogeneity which naturally arises when estimating the relationship between wealth and consumption.

Table 3 displays the two sets of estimates of immediate and eventual marginal propensity to consume out of *aggregate* wealth (first and second columns): in the top panel we use for each country the degree of consumption sluggishness reported in Table 2, whereas in the bottom panel we restrict the degree of consumption sluggishness to be equal to the average consumption persistence $\chi = 0.7$ for all countries. In both cases, the cross-country averages of immediate and eventual MPC out of total wealth lie in the neighborhood of 0.5 and 3 cents per euro, respectively. These results are somewhat lower than what obtained by Carroll et al. (2011b) for the US, where they estimated 0.9 and 4.8 cents per dollar, respectively. The MPCs are large and significant for Spain, Italy and France. In contrast, we find no wealth effect on consumption for Germany and the Netherlands. Slacalek (2009) obtains similar results for Spain, whereas Hamburg et al. (2008) study the link between consumption and wealth in Germany during 1980-2003 and find that permanent shocks to income rather than wealth seem to be the predominant driving force behind German private consumption.

Next, we investigate the MPC out of financial and housing wealth separately (columns 3-4 e 5-6 of Table 3, respectively). The cross-country averages of MPC out of financial wealth are around 0.7 and 4.5 cents per euro in the short- and medium-run, respectively. Regarding housing wealth, the MPC is on average almost 0.5 cents in the immediate and 2.4 cents in the medium-term. Contrary to the results reported by Carroll et al. (2011b) for US, in the largest EA economies the average MPC out of financial wealth is on average larger than the MPC out of housing wealth. However, cross-country comparison shows significant heterogeneity: (i) both financial and housing wealth effects are remarkable for Spain, with financial wealth effects larger than housing; (ii) Italy displays sizable financial wealth effects and not significant housing wealth effects;²⁶ (iii) for France the two effects are quite similar, although the marginal propensity to consume out of financial assets tends to be higher compared with the effect of housing assets;²⁷ (iv) Germany and the Netherlands reports not significant effects of changes in either types of wealth on consumption. The results are similar for the restricted and unrestricted degree of consumption sluggishness, and qualitatively consistent with Slacalek (2009).

Finally, Table 4 reports the results for disaggregate financial wealth. In the estimation we also control

²⁶Paiella (2007) using the Bank of Italy's Survey of Household Income and Wealth over the period 1991-2002 also finds that the marginal propensity to consume out of financial wealth is considerably larger than housing wealth in Italy.

²⁷Arrondel et al. (2015) use the French Wealth Survey1 (INSEE) combined with the Household Budget Survey (INSEE-EUROSTAT) and find that the estimated marginal propensity to consume out of financial wealth is slightly lower than for other assets.

for housing wealth. The estimates show a high degree of heterogeneity among countries. Changes in the value of equity seems to have a large and significant effect on consumption in Spain; the effect is also remarkable for France and Italy. Currency and deposits have a large effect in Spain. The results on housing wealth effects remain robust for Spain and France. Also in this case, the results are robust to the alternative specifications of the degree of consumption sluggishness.

4.3 Group-Specific Wealth Effects

Now we extend our analysis to include four more countries and group them in the following way: (i) All Countries; (ii) Big 5 (Germany, France, Italy, Spain, Netherlands) and Small Countries (Austria, Belgium, Finland, Portugal); (iii) Core (Austria, Belgium, Finland, France, Germany, Netherlands) and Periphery (Italy, Portugal, Spain).

We estimate the MPC out of aggregate and disaggregate wealth by seemingly unrelated regressions (SUR). This allows us to increase the efficiency in case of correlation among errors from individual regressions and to impose cross-equations restrictions. Specifically, we estimate the following equations:

$$\partial C_{t,i} = \alpha_i + \beta_i \bar{\partial} W_{t-1,i} + \tilde{\gamma}_i^\top \tilde{Z}_{t-1,i} + \varepsilon_{t,i} \quad i = 1, \dots, 9 \quad (11)$$

where i denotes the country. The estimates of the two key drivers of consumption, wealth and income, were restricted to be the same across countries of the same group.

Table 5 shows the eventual wealth effects for the three groups. The MPCs out of total wealth, financial and housing for all countries are very similar to the ones we get for the largest euro area countries, both quantitatively and qualitatively. The smaller countries are characterized by a null housing wealth effect and a large and significant MPCs out of debt securities. The MPCs out of total wealth is somewhat larger for the Big 5 whereas the MPCs out of financial wealth is larger for the rest of the sample. Our results document remarkable differences between periphery and core countries. The former display a MPC out of total wealth that is about 2 times larger than what reported for the latter. The difference is remarkable in terms of the MPCs out of financial wealth which is about 4.5 times larger. Among all financial assets components, the wealth effect of changes in the value of equity result to be about 3 times larger in the periphery economies. In contrast, no significant differences are reported in terms of housing wealth effect, which remains around 3 cent per euro across different groups of countries.

4.4 Robustness Checks

In this section we perform two robustness analysis.²⁸ First, we re-estimate the wealth effects based on an alternative estimate of consumption growth sluggishness for the five largest euro area countries. We consider a different set of instrumental variables for Equation 3, i.e. the consumption growth, the disposable income growth, the unemployment rate, the differenced short-term interest rate and the interest rate spread. Table 6 reports the results. The average degree of consumption growth persistence is 0.61, with a standard deviation equal to 0.24. Slacalek (2009) obtains a similar value (0.49) averaged across Germany, France, Italy, Spain and the Netherlands, by using the same set of instrumental variables. As the values of χ remain similar among countries, the wealth effects are robust both at aggregate and disaggregate level, as shown in Table 7.

Second, we repeat the whole analysis for a sub-sample period 1999Q1-2010Q1, which ends before the sovereign debt crisis took place. Interestingly, the results are robust to a change in the sample period. Indeed, the estimation of both the consumption growth sluggishness (Table 9) and wealth effects (Tables 10, 11 12) are qualitatively and quantitatively similar. This suggests that the crisis has not affected the dynamics of consumption growth and the impact of wealth changes in the short- and medium-run.

5 Conclusion

This paper provides new evidence on the empirical relationship between consumption and wealth growth for a number of euro area countries. We use the methodology proposed by Carroll et al. (2011b) and newly harmonized aggregated and disaggregated wealth from the Household Sector Report. Our results suggest that:

- the marginal propensity to consume out of total wealth averaged across the largest euro area economies is significant but somewhat lower than what reported in the literature for Anglo-Saxon countries;
- financial wealth effects are significantly larger than housing wealth effects;
- heterogeneity points towards large and significant effects for France, Italy and Spain, while not significant for the Netherlands and Germany.

In addition, we also find that the high degree of heterogeneity across countries is reflected in the marginal propensity to consume out of the sub-components of financial wealth. In particular, the wealth

²⁸In the Appendix A.2 we also report additional results of cointegration tests. Given that the evidence on the existence of a stable cointegration among consumption, wealth and income is mixed, we estimate the wealth effects on consumption in log-levels and growth rates (A.3).

effect of equity is large and significant for Spain and also relevant for Italy and France. Adding more countries to the analysis also convey interesting results and remarkable differences emerge between core and periphery countries.

A Appendix

A.1 Data

1. Households Consumption: Individual consumption expenditure at market prices, Households, Chain linked volumes, reference year 2010, Euro, Calendar and seasonally adjusted. Source: ESA2010 - Eurostat National Accounts, Main Aggregate, European Central Bank.
2. Population: Total economy, Persons. Source: ESA2010 - Eurostat National Accounts, Main Aggregate, European Central Bank.
3. Consumption Deflator: Individual consumption expenditure, Deflator, Households and non profit institutions serving households, Calendar and seasonally adjusted. Source: ESA2010 - Eurostat National Accounts, Main Aggregate, European Central Bank.
4. Households Housing Wealth: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Sector Accounts, European Central Bank.
5. Total Financial Assets of Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Assets (Net Acquisition of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
6. Currency and Deposits of Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Assets (Net Acquisition of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
7. Debt securities held by Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Assets (Net Acquisition of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
8. Loans granted by Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Assets (Net Acquisition

of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.

9. Equity and investment fund shares held by Households : Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Assets (Net Acquisition of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
10. Insurance, pension and standardized guarantee schemes of Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Assets (Net Acquisition of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
11. Total Financial Liabilities of Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Liabilities (Net Incurrence of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
12. Debt securities issued by Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Liabilities (Net Incurrence of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
13. Loans granted to Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Liabilities (Net Incurrence of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
14. Equity and investment fund shares issued by Households : Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Liabilities (Net Incurrence of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.
15. Insurance, pension and standardized guarantee schemes of Households: Reporting institutional sector Households, non-profit institutions serving households, Closing balance sheet, Counterpart

area World (all entities), Counterpart institutional sector Total economy including Rest of the World (all sectors), Liabilities (Net Incurrence of), Current price, Euro. Source: ESA2010 - Eurostat Quarterly Financial and Non-financial Sector Accounts, European Central Bank.

16. Disposable income of households: Reporting institutional sector Households and non profit institutions serving households, Counterpart area World (all entities) counterpart institutional sector Total economy, Balance (Credits minus Debits), Current prices, Euro. Source: ESA2010 - Eurostat Quarterly Sector Accounts, European Central Bank.
17. Consumer Confidence Indicator: Total, Seasonally adjusted, Percentage balances. Source: EU Commission, DG-ECFIN, Consumer survey.
18. Unemployment Rate: Standardized unemployment rate, Total (all ages), Total (male and female), Seasonally adjusted, Percentage of civilian workforce. Source: Eurostat, European Central Bank.
19. Spreads between the composite interest rate on households loans for house purchases and the composite risk free rate is computed in two steps. First, we compute the composite loan interest rate as the weighted average of interest rates at each maturity range (up to 1 year, 1-5 years, 5-10 years, over 10 years). Second, we compute corresponding composite risk free rates that take into account the maturity breakdown of loans. The maturity-adjusted risk-free rate is the weighted average (with the same weights as in case of composite loan interest rate) of the following risk-free rates chosen for maturity ranges:
 - 3 month EURIBOR (up to 1 year)
 - German Bund 3 year yield (1-5 years)
 - German Bund 7 year yield (5-10 years)
 - German Bund 20 year yield (over 10 years).
20. Households Loans for House Purchases (for several maturities): Outstanding amounts at the end of the period (stocks), MFIs excluding ESCB reporting sector - Loans, All currencies combined - Euro area (changing composition) counterpart, Households and non-profit institutions serving households sector, denominated in Euro. Source: MFI Balance Sheet Items Statistics (BSI Statistics), European Central Bank.
21. Bank interest rates - Loans to Households for House Purchase (new business): Credit and other institutions (MFI except MMFs and central banks) reporting sector - Lending for house purchase excluding revolving loans and overdrafts, convenience and extended credit card debt, Total initial rate fixation, New business coverage, Households and non-profit institutions serving households sector, denominated in Euro. Source: National Central Banks, European Central Bank.

22. Euribor 3-month. Source: Reuters, European Central Bank.
23. German Bund (for several maturities): Germany Government Benchmark bond yield. Source: Reuters, European Central Bank.
24. Stock Market Price: MSCI Index. Source: Datastream.

A.2 Test for Cointegration

In this section we perform the Phillips-Ouliaris and Johansen test for investigating the existence of a stable cointegration relation among log-levels of consumption, wealth and income, as in the following equation:

$$\log C_t = \alpha + \beta_w \log W_t + \beta_y \log Y_t + \varepsilon_t \quad (12)$$

where W_t is defined as: (i) total wealth; (ii) financial and housing wealth; (iii) currency and deposits, debt securities and equities. Y_t denotes the disposable income. The Phillips-Ouliaris test applies the augmented Dickey-Fueller test on regression residuals to test whether they are $I(1)$. Also the Johansen trace and max tests the null hypothesis of no cointegration, but they differ for the alternative hypothesis: for the former, the alternative is that there *at most* p cointegrating vector; for the latter, *one* cointegrating vector. As shown in Table A.1, the results suggest that there is mixed evidence: according to the Phillips-Ouliaris test, there is no evidence in a favour of a stable cointegration. On the contrary, based on both Johansen tests, the results are in favor of a stable cointegration relation in most cases.

Table A.1: Test for Cointegration in the “Levels” Model

Country	Wealth			Financial and Housing			Financial Split and Housing		
	Phillips-Ouliaris		Johansen	Phillips-Ouliaris		Johansen	Phillips-Ouliaris		Johansen
	$t_{\hat{\alpha}_*}$	λ_{trace}	λ_{max}	$t_{\hat{\alpha}_*}$	λ_{trace}	λ_{max}	$t_{\hat{\alpha}_*}$	λ_{trace}	λ_{max}
Germany	-2.89	34.28**	22.42**	-3.99	50.36**	25.83*	-3.38	125.90***	53.90***
France	-3.55	41.06***	20.97**	-3.86	62.92***	26.87*	-4.10	143.73***	56.85***
Italy	-2.85	25.40	15.24	-2.40	60.71***	29.48**	-2.80	117.40***	45.33***
Spain	-2.25	30.67**	13.74	-2.11	68.52***	34.14***	-3.25	131.45***	47.09***
Netherlands	-2.23	23.90	15.59	-2.16	55.36***	33.35***	-2.07	109.88***	48.77***

Notes: Statistical significance was calculated using the critical values from Phillips and Ouliaris (1990), Table IIc, p.190. Statistical significance for the Johansen tests was calculated using the critical values from Osterwald-Lenum (1992). ADF and Johansen test statistics are calculated with 2 lags. {*, **, ***} = Statistical significance at {10, 5, 1} percent.

A.3 Estimation in Levels and Differences

To compare the results based on the sticky expectation model with the one based on the standard cointegration approach, we estimate the wealth effects using a cointegration regression between consumption, income and wealth. Specifically, we estimate the following equation we call “the levels model” by dynamic ordinary least squares (DOLS):

$$\log C_t = \alpha + \beta_w \log W_t + \beta_y \log Y_t + \varepsilon_t \quad (13)$$

for three specification of W_t : (i) total wealth; (ii) financial and housing wealth; (iii) currency and deposits, debt securities and equities. Y_t denotes the disposable income. The coefficients β_w are the elasticities of consumption with respect to wealth. The marginal propensity to consume are obtained by rescaling the elasticity with the most recent value of the consumption-wealth ratio.

In addition, we estimate an “atheoretical” version of the Equation 8, namely:

$$\frac{\Delta C_t}{C_{t-3}} = \alpha + \sum_{i=1}^2 \beta_{c,i} \frac{\Delta C_{t-1}}{C_{t-3}} + \sum_{i=0}^2 \beta_{w,i} \frac{\Delta W_{t-1}}{C_{t-3}} + \sum_{i=0}^2 \beta_{y,i} \frac{\Delta Y_{t-1}}{C_{t-3}} + \varepsilon_t \quad (14)$$

where the eventual MPC out of wealth is calculated as the sum of the wealth coefficients $\sum_{i=0}^2 \beta_{w,i}$. The number of lags is set to 2, in order to keep the number of regressors manageable. This implies that all variables are rescaled with initial consumption level C_{t-3} .

Table A.2 and Table A.3 show the results for Equation 13 and 14, respectively. While the former are not supportive, on the contrary the latter are qualitatively consistent with the results we discuss in the main analysis. Indeed, the wealth effect is significant (but smaller) for all countries, except Germany. Moreover, financial wealth effect is larger than housing. Finally, equity is statistically significant and large for France, Italy and Spain, similarly to the results reported in Table 4, while housing effects are relevant for the Netherlands.

Table A.2: Eventual Wealth Effect: Levels

Country	Wealth	Financial	Housing	Curr.&Dep.	Debt Securities	Equity	Housing
	MPC_{w}^{ev}	MPC_{fw}^{ev}	MPC_{hw}^{ev}	MPC_{curdep}^{ev}	MPC_{debsec}^{ev}	MPC_{inequ}^{ev}	MPC_{hu}^{ev}
Germany	1.82	-1.28	3.60*	-2.31	-3.56	-2.13	3.03
France	1.13***	1.53***	1.12***	4.49	-0.56	3.25***	0.99***
Italy	-0.24	0.45	-0.47	4.43	-2.82	0.06	-0.76
Spain	0.66	2.30	0.71	-8.44	1.71	8.32***	0.65
Netherlands	-0.31	0.32	4.48***	-3.36	0.47	-4.00	4.72***
<i>Mean</i>	0.61	0.66	1.89	-1.04	-0.95	1.10	1.73

Notes: Marginal propensities to consume in cents per euro of additional wealth. $\{*, **, ***\}$ = Statistical significance at $\{10, 5, 1\}$ percent. The regression was estimated with DOLS with 1 lag and 1 lead of the explanatory variables. Statistical significance was calculated using the rescaled t-statistics as described in Hayashi (2000) for which the long-run variance of residuals from DOLS regression was computed using the Newey-West window with 4 lags.

Table A.3: Eventual Wealth Effect: Differences

Country	Wealth	Financial	Housing	Curr.&Dep.	Debt Securities	Equity	Housing
	MPC_w^{ev}	MPC_{fw}^{ev}	MPC_{hw}^{ev}	MPC_{curdep}^{ev}	MPC_{debsec}^{ev}	MPC_{inequ}^{ev}	MPC_{hw}^{ev}
Germany	-0.85	-0.45	-2.90	12.17	-13.38	3.82	-3.17
France	1.75***	2.74**	1.38**	-5.27	3.08	3.24*	1.19
Italy	1.72**	2.11**	0.59	-2.18	0.17	2.31**	1.23
Spain	1.75***	5.44***	0.89	-1.65	4.65	5.45***	1.10
Netherlands	0.81	0.66	3.50**	-9.23	0.55	2.98	4.25**
<i>Mean</i>	1.03	2.10	0.69	-1.23	-0.99	3.56	0.92

Notes: Marginal propensities to consume in cents per euro of additional wealth. $\{*, **, ***\}$ = Statistical significance at $\{10, 5, 1\}$ percent. Statistical significance was calculated as the p value of the test: $\sum_{i=0}^2 \beta_{w,i} = 0$

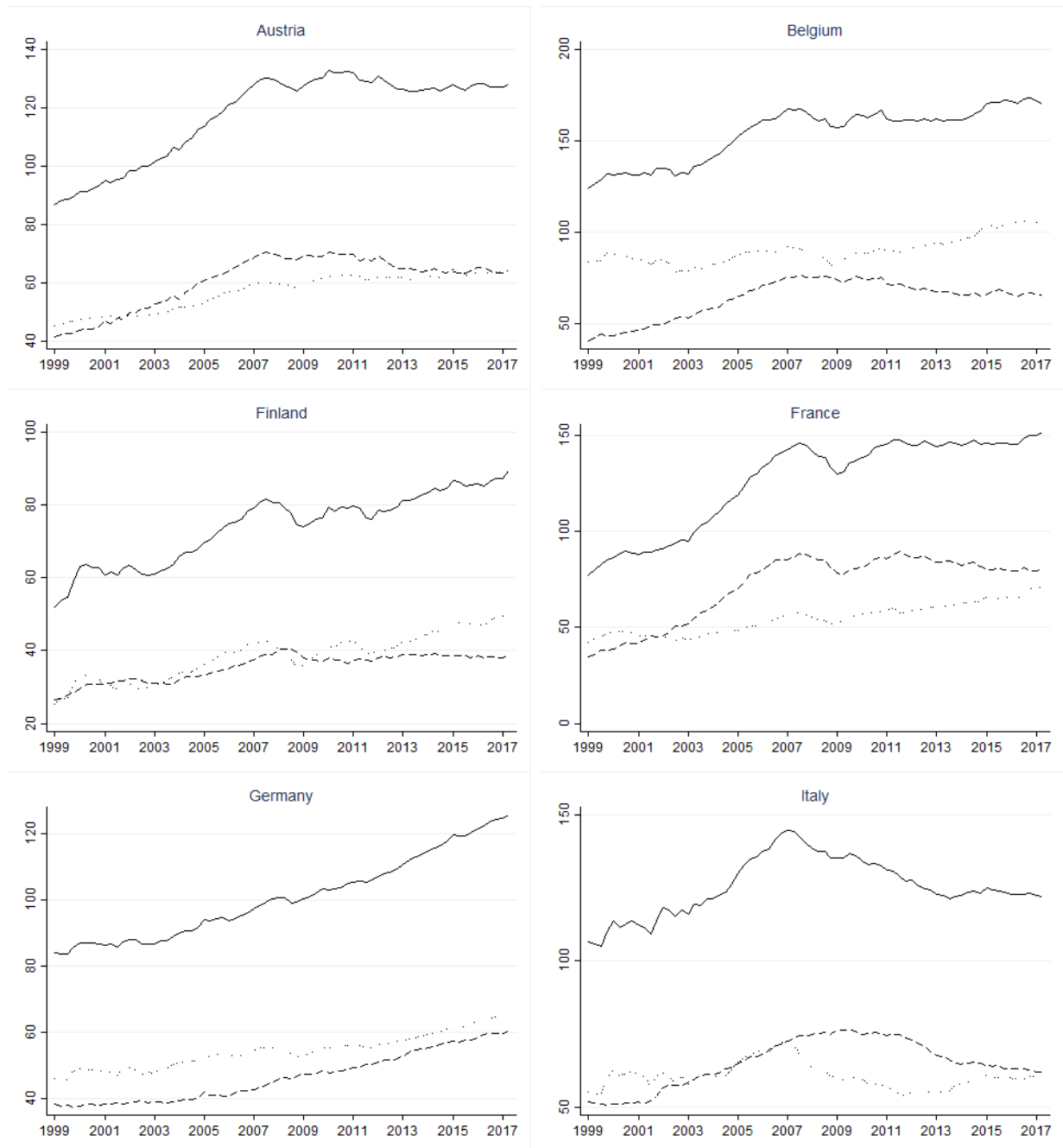
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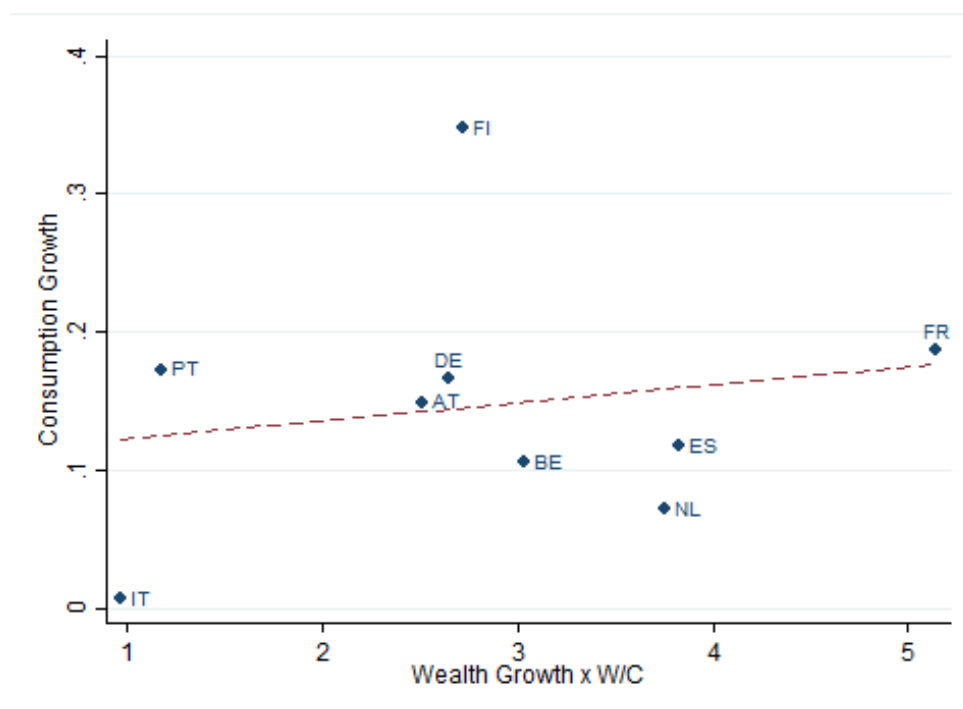
Figure 1: Financial and Housing Wealth





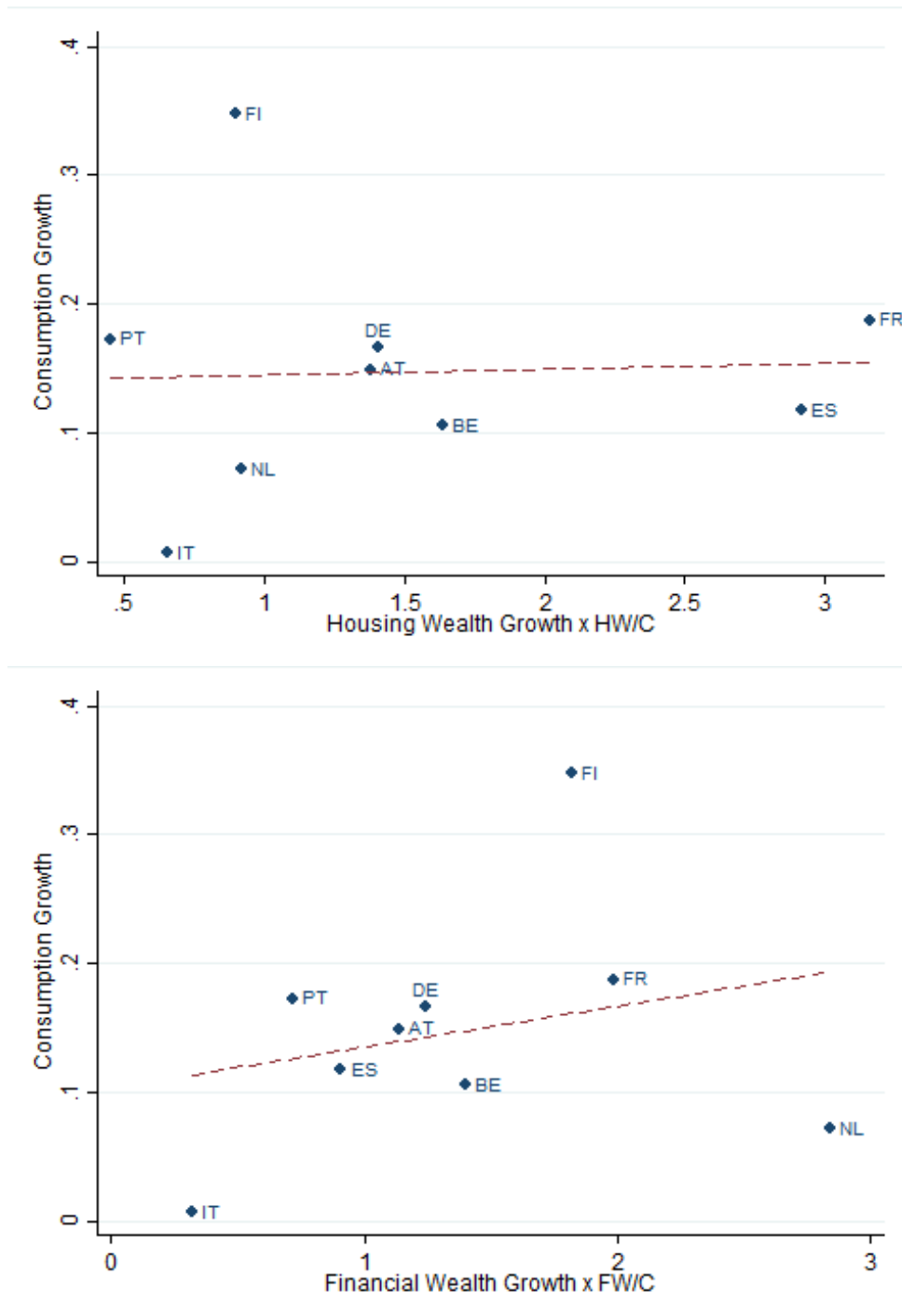
Notes: The graphs report the total wealth (solid line) and its two components, the net housing wealth (dashed line) and the net financial wealth (dotted line). Quarterly observations, 1999Q1 - 2017Q2. The series are in per capita real terms.

Figure 2: Consumption Growth and Wealth Growth 1999-2017



Notes: The graph reports consumption growth and rescaled wealth growth between 1999Q1 and 2017Q2; wealth growth is rescaled by multiplying with the wealth-consumption ratio of 1999Q1. Slope of the regression line: $MPC_w^{ev} = .045$ (p-value: 0.003).

Figure 3: Consumption Growth and Housing/Financial Wealth Growth 1999-2017



Notes: The top (bottom) graph reports consumption growth and rescaled housing (financial) wealth growth between 1999Q1 and 2017Q2; housing (financial) wealth growth is rescaled by multiplying with the housing (financial) wealth-consumption ratio of 1999Q1. Slope of the regression line: $MPC_{hw}^{ev} = .073$ (p-value: 0.014); $MPC_{fw}^{ev} = .091$ (p-value: 0.004)

Table 1: Wealth Composition

Country	(A) Assets shares of Wealth		(B) Assets shares of Financial Wealth			
	Financial	Housing	Curr.&Dep.	Debt Sec.	Equity	Other
Austria	48.51	51.49	43.81	28.29	27.21	0.69
Belgium	58.73	41.27	28.25	32.48	39.00	0.26
Finland	51.84	48.16	34.17	21.05	45.46	-0.68
France	43.98	56.02	31.88	38.10	30.85	-0.83
Germany	54.12	45.88	37.78	39.46	22.06	0.71
Italy	48.27	51.73	28.93	35.63	37.31	-1.87
Netherlands	68.48	31.52	21.93	60.57	17.67	-0.17
Portugal	43.04	56.96	47.44	26.17	29.49	-3.10
Spain	30.52	69.48	42.93	18.45	39.18	-0.57

Group	(A) Assets shares of Wealth		(B) Assets shares of Financial Wealth			
	Financial	Housing	Curr.&Dep.	Debt Sec.	Equity	Other
Big5	49.07	50.93	32.69	38.44	29.41	-0.55
NoBig5	50.53	49.47	38.42	27.00	35.29	-0.71
Core	54.27	45.73	32.97	36.66	30.37	0.00
Periphery	40.61	59.39	39.76	26.75	35.33	-1.85
All	49.72	50.28	35.23	33.36	32.03	-0.62

Notes: Shares in percentage as average over the period 1999Q1-2017Q2.

All counties: AT, BE, FI, FR, DE, IT, NL, PT, ES.

Big 5: DE, FR, IT, NL, ES.

Core: AT, BE, DE, FI, FR, NL.

Table 2: Consumption Sluggishness

$$\Delta \log C_t = \mu + \chi \Delta \log C_{t-1} + \varepsilon_t$$

Country	(A) χ	(B) se_χ	(C) $H_0 : \chi = 0$	(D) $\bar{R}_1^2$
Germany	0.81	0.55	0.043	0.03
France	0.66	0.27	0.005	0.16
Italy	0.67	0.14	0.001	0.32
Spain	0.88	0.13	0.000	0.57
Netherlands	0.49	0.28	0.080	0.13
<i>Mean</i>	0.70	0.27	-	-

Notes: Quarterly observations, 1999Q1 - 2017Q2. Instruments: Lag $t - 2$ of net wealth growth, growth rate of stock prices, change in unemployment rate, growth rate of disposable income, interest rate spread. Regressions estimated with instrumental variables. Robust p val denotes the p value testing $\chi = 0$ with Moreira's CLR test (robust to weak instruments). $\bar{R}_1^2$ is the adjusted R^2 from the first-stage regressions of ΔC_t on instruments.

Table 3: Immediate and Eventual Effects of Wealth on Consumption

$$\partial C_t = \alpha + \tilde{\beta} \bar{\partial} W_{t-1} (\tilde{\beta}_{fw} \bar{\partial} F W_{t-1} + \tilde{\beta}_{hw} \bar{\partial} H W_{t-1}) + \tilde{\gamma}^\top \tilde{Z}_{t-1} + \varepsilon_t$$

χ Unrestricted						
Country	Wealth		Financial		Housing	
	MPC_w^{im}	MPC_w^{ev}	MPC_{fw}^{im}	MPC_{fw}^{ev}	MPC_{hw}^{im}	MPC_{hw}^{ev}
Germany	-0.60	-3.84	-0.43	-2.77	-1.13	-7.25
France	0.74***	3.27***	0.93*	4.11*	0.69**	3.07**
Italy	1.32***	5.92***	1.29***	5.80***	1.40	6.29
Spain	0.97***	9.37***	1.51***	14.56***	0.78***	7.49***
Netherlands	0.25	1.00	0.18	0.73	0.62	2.47
<i>Mean</i>	0.54	3.14	0.70	4.49	0.47	2.42

$\chi = 0.7$						
Country	Wealth		Financial		Housing	
	MPC_w^{im}	MPC_w^{ev}	MPC_{fw}^{im}	MPC_{fw}^{ev}	MPC_{hw}^{im}	MPC_{hw}^{ev}
Germany	-0.73	-3.49	-0.60	-2.88	-1.13	-5.40
France	0.68***	3.24***	0.88*	4.17*	0.64**	3.03**
Italy	1.29***	6.15***	1.28***	6.10***	1.33	6.32
Spain	1.25***	5.94***	2.02***	9.61***	0.97***	4.62***
Netherlands	0.23	1.10	0.18	0.87	0.43	2.05
<i>Mean</i>	0.54	2.59	0.75	3.57	0.45	2.13

Notes: Quarterly observations, 1999Q1 - 2017Q2. Control Variables: income growth, unemployment rate, sentiment, differenced short-term interest rate and interest rate spread. Marginal propensities to consume in cents per euro of additional wealth. $\{*, **, ***\}$ = Statistical significance at $\{10, 5, 1\}$ percent.

Table 4: Immediate and Eventual Effects of Financial Assets

$$\partial C_t = \alpha + \tilde{\beta}_{cd}\bar{\partial}CD_{t-1} + \tilde{\beta}_{ds}\bar{\partial}DS_{t-1} + \tilde{\beta}_{eq}\bar{\partial}EQD_{t-1} + \tilde{\beta}_{hw}\bar{\partial}HW_{t-1} + \tilde{\gamma}^T\tilde{Z}_{t-1} + \varepsilon_t$$

χ Unrestricted									
Country	Currency and Deposits		Debt Securities		Equity		Housing		
	MPC ^{im} _{curdep}	MPC ^{ev} _{curdep}	MPC ^{im} _{debsec}	MPC ^{ev} _{debsec}	MPC ^{im} _{inequ}	MPC ^{ev} _{inequ}	MPC ^{im} _{hw}	MPC ^{ev} _{hw}	
Germany	4.19	26.89	-7.21***	-46.25***	0.84	5.37	-0.92	-5.90	
France	-2.20	-9.76	-0.51	-2.26	1.79**	7.94**	0.69**	3.04**	
Italy	1.73	7.77	-2.66	-11.95	1.48***	6.65***	1.59	7.12	
Spain	5.74**	55.22**	-0.25	-2.44	1.41***	13.53***	0.80***	7.74***	
Netherlands	1.50	6.01	0.13	0.53	-0.50	-1.99	0.60	2.41	
<i>Mean</i>	2.19	17.23	-2.10	-12.48	1.00	6.30	0.55	2.88	

$\chi = 0.7$									
Country	Currency and Deposits		Debt Securities		Equity		Housing		
	MPC ^{im} _{curdep}	MPC ^{ev} _{curdep}	MPC ^{im} _{debsec}	MPC ^{ev} _{debsec}	MPC ^{im} _{inequ}	MPC ^{ev} _{inequ}	MPC ^{im} _{hw}	MPC ^{ev} _{hw}	
Germany	5.21	24.79	-8.69***	-41.40***	0.94	4.48	-0.83	-3.97	
France	-2.27	-10.82	-0.44	-2.11	1.69**	8.04**	0.62**	2.97**	
Italy	2.32	11.04	-2.61*	-12.41*	1.44***	6.83***	1.54	7.34	
Spain	6.51	31.00	-0.21	-1.02	2.02***	9.60***	0.93***	4.41***	
Netherlands	1.19	5.68	0.14	0.68	-0.45	-2.16	0.40	1.93	
<i>Mean</i>	2.59	12.34	-2.36	-11.25	1.12	5.36	0.53	2.54	

Notes: Quarterly observations, 1999Q1 - 2017Q2. Control Variables: income growth, unemployment rate, sentiment, differenced short-term interest rate and interest rate spread. Marginal propensities to consume in cents per euro of additional wealth. {*, **, ***} = Statistical significance at {10, 5, 1} percent.

Table 5: Wealth Effects - Panel SUR Estimation

	χ	Wealth	Financial	Housing	Curr.&Dep.	Debt Sec.	Equity	Housing
All Countries	0.68	3.39***	4.24***	3.03***	-5.57	1.01	7.21***	3.04***
Big 5	0.70	3.55***	4.08***	3.33***	-5.27	0.46	8.38***	3.33***
No Big 5	0.65	2.51***	4.64***	0.97	-2.25	11.16**	4.72***	1.29
Core	0.63	2.24***	2.39***	2.41***	-5.60	0.83	4.90***	2.18***
Periphery	0.77	4.84***	10.69***	3.34***	-3.51	7.02	11.35***	3.76***

Notes: Quarterly observations, 1999Q1 - 2017Q2. Eventual marginal propensities to consume in cents per euro of additional wealth. SUR Estimates, $\{*, **, ***\}$ = Statistical significance at $\{10, 5, 1\}$ percent.
All countries: AT, BE, FI, FR, DE, IT, NL, PT, ES.
Big 5: DE, FR, IT, NL, ES.
Core: AT, BE, DE, FI, FR, NL.

Table 6: RA1 Consumption Sluggishness

$$\Delta \log C_t = \mu + \chi \Delta \log C_{t-1} + \varepsilon_t$$

Country	χ	se_χ	$H_0 : \chi = 0$	$\bar{R}_1^2$
Germany	0.52	0.39	0.070	0.07
France	0.64	0.25	0.002	0.20
Italy	0.80	0.12	0.000	0.51
Spain	0.84	0.16	0.000	0.36
Netherlands	0.28	0.27	0.417	0.11
<i>Mean</i>	0.61	0.24	-	-

Notes: Quarterly observations, 1999Q1 - 2017Q2. Instruments: Lag $t - 2$ of consumption growth, disposable income growth, unemployment rate, differenced short-term interest rate, interest rate spread. Regressions estimated with instrumental variables. Robust p val denotes the p value testing $\chi = 0$ with Moreira's CLR test (robust to weak instruments). $\bar{R}_1^2$ is the adjusted R^2 from the first-stage regressions of ΔC_t on instruments.

Table 7: RA1 Immediate and Eventual Effects of Wealth on Consumption

$$\partial C_t = \alpha + \tilde{\beta} \bar{\partial} W_{t-1} (\tilde{\beta}_{fw} \bar{\partial} FW_{t-1} + \tilde{\beta}_{hw} \bar{\partial} HW_{t-1}) + \tilde{\gamma}^\top \tilde{Z}_{t-1} + \varepsilon_t$$

χ Unrestricted						
Country	Wealth		Financial		Housing	
	MPC_w^{im}	MPC_w^{ev}	MPC_{fw}^{im}	MPC_{fw}^{ev}	MPC_{hw}^{im}	MPC_{hw}^{ev}
Germany	-0.83	-3.34	-0.86	-3.45	-0.75	-3.00
France	0.76***	3.30***	0.95*	4.10*	0.72**	3.10**
Italy	1.20***	7.39***	1.22***	7.53***	1.13	6.98
Spain	1.04***	7.71***	1.63***	12.11***	0.82***	6.12***
Netherlands	0.25	1.23	0.15	0.75	0.94	4.66
<i>Mean</i>	0.48	3.26	0.62	4.21	0.57	3.57

$\chi = 0.61$						
Country	Wealth		Financial		Housing	
	MPC_w^{im}	MPC_w^{ev}	MPC_{fw}^{im}	MPC_{fw}^{ev}	MPC_{hw}^{im}	MPC_{hw}^{ev}
Germany	-0.80	-3.37	-0.74	-3.10	-0.99	-4.18
France	0.80***	3.34***	0.98*	4.11*	0.75**	3.16**
Italy	1.35***	5.69***	1.30***	5.47***	1.52	6.38
Spain	1.37***	5.76***	2.25***	9.46***	1.06***	4.45***
Netherlands	0.24	1.02	0.19	0.78	0.50	2.10
<i>Mean</i>	0.59	2.49	0.80	3.35	0.57	2.38

Notes: Quarterly observations, 1999Q1 - 2017Q2. Control Variables: income growth, unemployment rate, sentiment, differenced short-term interest rate and interest rate spread. Marginal propensities to consume in cents per euro of additional wealth. $\{*, **, ***\}$ = Statistical significance at $\{10, 5, 1\}$ percent.

Table 8: RA1 Immediate and Eventual Effects of Financial Assets

$$\partial C_t = \alpha + \tilde{\beta}_{cd}\bar{\partial}CD_{t-1} + \tilde{\beta}_{ds}\bar{\partial}DS_{t-1} + \tilde{\beta}_{eq}\bar{\partial}EQD_{t-1} + \tilde{\beta}_{hw}\bar{\partial}HW_{t-1} + \tilde{\gamma}^\top \tilde{Z}_{t-1} + \varepsilon_t$$

χ Unrestricted										
Country	Currency and Deposits		Debt Securities		Equity		Housing			
	MPC ^{im} _{curdep}	MPC ^{ev} _{curdep}	MPC ^{im} _{debsec}	MPC ^{ev} _{debsec}	MPC ^{im} _{inequ}	MPC ^{ev} _{inequ}	MPC ^{im} _{hw}	MPC ^{ev} _{hw}		
Germany	6.28	25.15	-10.01**	-40.08**	0.95	3.79	-0.30	-1.20		
France	-2.16	-9.36	-0.54	-2.34	1.83**	7.94**	0.71**	3.08**		
Italy	3.94	24.27	-2.36*	-14.53*	1.30***	7.99***	1.36	8.38		
Spain	5.96**	44.27**	-0.23	-1.69	1.54***	11.44***	0.84***	6.21***		
Netherlands	1.75	8.70	0.09	0.45	-0.47	-2.35	0.94	4.69		
Mean	3.15	18.61	-2.61	-11.64	1.03	5.76	0.71	4.23		

$\chi = 0.61$										
Country	Currency and Deposits		Debt Securities		Equity		Housing			
	MPC ^{im} _{curdep}	MPC ^{ev} _{curdep}	MPC ^{im} _{debsec}	MPC ^{ev} _{debsec}	MPC ^{im} _{inequ}	MPC ^{ev} _{inequ}	MPC ^{im} _{hw}	MPC ^{ev} _{hw}		
Germany	5.85	24.57	-9.55***	-40.15***	0.97	4.10	-0.61	-2.57		
France	-2.10	-8.84	-0.59	-2.47	1.90**	7.97**	0.75**	3.15**		
Italy	0.86	3.62	-2.71	-11.40	1.54***	6.49***	1.63	6.84		
Spain	6.70	28.17	-0.26	-1.08	2.32***	9.75***	0.98***	4.12***		
Netherlands	1.33	5.61	0.14	0.60	-0.48	-2.03	0.48	2.00		
Mean	2.53	10.62	-2.59	-10.90	1.25	5.25	0.64	2.71		

Notes: Quarterly observations, 1999Q1 - 2017Q2. Control Variables: income growth, unemployment rate, sentiment, differenced short-term interest rate and interest rate spread. Marginal propensities to consume in cents per euro of additional wealth. {*, **, ***} = Statistical significance at {10, 5, 1} percent.

Table 9: RA2 Consumption Sluggishness

$$\Delta \log C_t = \mu + \chi \Delta \log C_{t-1} + \varepsilon_t$$

Country	χ	se_χ	Robust p val	
			$H_0 : \chi = 0$	$\bar{R}_1^2$
Germany	0.70	0.55	0.111	0.04
France	0.67	0.22	0.001	0.30
Italy	0.90	0.21	0.000	0.34
Spain	0.80	0.18	0.000	0.51
Netherlands	0.44	0.26	0.087	0.28
<i>Mean</i>	0.70	0.28	-	-

Notes: Quarterly observations, 1999Q1 - 2010Q1. Instruments: Lag $t - 2$ of net wealth growth, growth rate of stock prices, change in unemployment rate, growth rate of disposable income, interest rate spread. Regressions estimated with instrumental variables. Robust p val denotes the p value testing $\chi = 0$ with Moreira's CLR test (robust to weak instruments). $\bar{R}_1^2$ is the adjusted R^2 from the first-stage regressions of ΔC_t on instruments.

Table 10: RA2 Immediate and Eventual Effects of Wealth on Consumption

$$\partial C_t = \alpha + \tilde{\beta} \bar{\partial} W_{t-1} (\tilde{\beta}_{fw} \bar{\partial} F W_{t-1} + \tilde{\beta}_{hw} \bar{\partial} H W_{t-1}) + \tilde{\gamma}^\top \tilde{Z}_{t-1} + \varepsilon_t$$

χ Unrestricted						
Country	Net Wealth		Financial		Housing	
	MPC_w^{im}	MPC_w^{ev}	MPC_{fw}^{im}	MPC_{fw}^{ev}	MPC_{hw}^{im}	MPC_{hw}^{ev}
Germany	-2.10	-9.90	-2.31	-10.91	-1.34	-6.33
France	0.42	1.90	0.93	4.19	0.37	1.68
Italy	1.18***	13.18***	1.25***	13.91***	0.87	9.72
Spain	1.73***	10.82***	2.83**	17.67**	1.21**	7.58**
Netherlands	-0.42	-1.72	-0.63	-2.55	0.01	0.03
<i>Mean</i>	0.16	2.86	0.41	4.46	0.23	2.54

$\chi = 0.7$						
Country	Net Wealth		Financial		Housing	
	MPC_w^{im}	MPC_w^{ev}	MPC_{fw}^{im}	MPC_{fw}^{ev}	MPC_{hw}^{im}	MPC_{hw}^{ev}
Germany	-2.08	-9.92	-2.29	-10.92	-1.35	-6.41
France	0.39	1.84	0.83	3.96	0.34	1.64
Italy	1.36***	6.45***	1.31***	6.26***	1.54	7.35
Spain	1.90***	9.03***	3.22**	15.35**	1.26**	6.00**
Netherlands	-0.30	-1.41	-0.18	-0.86	-0.49	-2.35
<i>Mean</i>	0.25	1.20	0.58	2.76	0.26	1.24

Notes: Quarterly observations, 1999Q1 - 2010Q1. Marginal propensities to consume in cents per euro of additional wealth. {*, **, ***} = Statistical significance at {10, 5, 1} percent.

Table 11: RA2 Immediate and Eventual Effects of Financial Assets

$$\partial C_t = \alpha + \tilde{\beta}_{cd}\bar{\partial}CD_{t-1} + \tilde{\beta}_{ds}\bar{\partial}DS_{t-1} + \tilde{\beta}_{eq}\bar{\partial}EQD_{t-1} + \tilde{\beta}_{hw}\bar{\partial}HW_{t-1} + \tilde{\gamma}^T\tilde{Z}_{t-1} + \varepsilon_t$$

χ Unrestricted										
Country	Currency and Deposits		Debt Securities		Equity		Housing			
	MPC ^{im} _{curdep}	MPC ^{ev} _{curdep}	MPC ^{im} _{debsec}	MPC ^{ev} _{debsec}	MPC ^{im} _{inequ}	MPC ^{ev} _{inequ}	MPC ^{im} _{hw}	MPC ^{ev} _{hw}		
Germany	-12.80	-60.42	-8.78**	-41.47**	-1.48	-6.98	-0.16	-0.73		
France	2.51	11.29	-2.34	-10.55	1.73	7.82	0.24	1.08		
Italy	-0.46	-5.11	-0.04	-0.45	1.33***	14.76***	0.96	10.71		
Spain	-1.74	-10.85	1.88	11.76	3.54**	22.12**	1.00	6.24		
Netherlands	1.85	7.51	-1.19	-4.84	-0.80	-3.26	0.48	1.95		
<i>Mean</i>	-2.13	-11.52	-2.09	-9.11	0.86	6.89	0.51	3.85		

$\chi = 0.7$										
Country	Currency and Deposits		Debt Securities		Equity		Housing			
	MPC ^{im} _{curdep}	MPC ^{ev} _{curdep}	MPC ^{im} _{debsec}	MPC ^{ev} _{debsec}	MPC ^{im} _{inequ}	MPC ^{ev} _{inequ}	MPC ^{im} _{hw}	MPC ^{ev} _{hw}		
Germany	-12.88	-61.33	-8.74**	-41.63**	-1.47	-6.98	-0.16	-0.75		
France	2.25	10.70	-2.12	-10.11	1.58	7.54	0.23	1.08		
Italy	-5.58	-26.59	0.14	0.69	1.58***	7.50***	1.19	5.64		
Spain	-2.43	-11.55	2.38	11.34	3.92**	18.68**	1.12*	5.32*		
Netherlands	4.54	21.61	-0.70	-3.33	-0.60	-2.87	0.16	0.77		
<i>Mean</i>	-2.82	-13.44	-1.81	-8.61	1.00	4.77	0.51	2.41		

Notes: Quarterly observations, 1999Q1 - 2010Q1. Marginal propensities to consume in cents per euro of additional wealth. {*, **, ***} = Statistical significance at {10, 5, 1} percent.

Table 12: Wealth Effects - Panel SUR Estimation

	χ	Wealth	Financial	Housing	Curr.&Dep.	Debt Securities	Equity	Housing
All Countries	0.67	4.70***	7.67***	2.76***	-10.62	-0.07	9.19***	1.94**
Big 5	0.70	5.00***	7.14***	3.80***	-9.62	-4.37	8.76***	3.05***
No Big 5	0.64	2.90***	7.59***	-2.34	-12.30	6.17	9.86***	-4.12
Core	0.59	3.00***	5.55***	1.45	-10.28	-4.74	8.40***	0.47
Periphery	0.84	8.21***	12.50***	5.03***	-2.97	20.53***	13.06***	4.49***

Notes: Quarterly observations, 1999Q1 - 2010Q1. Eventual marginal propensities to consume in cents per euro of additional wealth. SUR Estimates, $\{^*, **, ***\}$ = Statistical significance at $\{10, 5, 1\}$ percent.

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Cinzia Guerrieri

LUISS Guido Carli, Rome, Italy; email: cguerrieri@luiss.it

Caterina Mendicino

European Central Bank, Frankfurt am Main, Germany; email: caterina.mendicino1@ecb.europa.eu

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Postal address 60640 Frankfurt am Main, Germany

Telephone +49 69 1344 0

Website www.ecb.europa.eu

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