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ABSTRACT

Family Finances and Debt Overhang: Evolving Consumption Patterns of Spanish Households*

This paper studies the direct impact of households' debt on consumption over the business cycle. We use household-level panel data for Spain, and focus on a interesting period of analysis, 2002-2017, characterized by large variations in leverage, consumption, and asset prices. We find that debt levels exert a negative impact on consumption, which is particularly strong in periods of high leverage and falling asset prices. This negative effect is persistent in time and significant along the post-Great Recession deleveraging process of Spanish households. We further observe that: (i) changes in households' debt in past periods are not relevant in determining consumption; (ii) households adjust faster their consumption to debt that is non-related to real estate assets; (iii) results are not driven by the characteristics of real estate loans; and (iv) credit constraints do not play a major role in shaping the debt-consumption nexus. We conclude that, in contrast to the spending normalization hypothesis, it is debt overhang what is likely to prevail in a situation of high leverage and financial stress such as the one brought by the Great Recession. Consequently, policies preventing households to embark in excessive leverage in good times and debt relief policies in bad times have a role to play to avoid larger consumption decreases in recessive periods.

JEL Classification: D12, D14, E21, G01, G51

Keywords: consumption, household debt, financial stress, debt overhang, survey

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1 Introduction

A sizeable increase in households' debt was experienced in many countries before the Great Recession in parallel with a rise in asset values. The economic recession that followed, on the contrary, was a period of debt reduction and pronounced slump in consumption. The extent to which households leverage during the expansionary years ended up affecting consumption once households started deleveraging has attracted a growing body of theoretical and empirical literature.

The idea that household debt is behind economic downturns goes back to the influential work of Fisher (1933) and regained attention along the facts just described. From a theoretical perspective, some papers study how the behavior of debt-constrained households may contribute to decrease economic activity (Eggertsson and Krugman, 2012; Korinek and Simsek, 2016; Guerrieri and Lorenzoni, 2017).[1] From an empirical perspective, Mian and Sufi (2018) show that an increase in credit supply unrelated to fundamental improvements in income or productivity may be the shock triggering households' debt boom and bust. Other authors associate high levels of debt in the dawn of the Great Recession with lower output growth and higher unemployment (Mian et al., 2017; Alter et al., 2018; Mian et al., 2020), while some other authors have studied to what extent the excessive level of debt and subsequent deleveraging have also contributed to decrease households' consumption (Dynan, 2012; Albuquerque and Krustev, 2018).

One important contribution of this literature is the acknowledgement of a direct effect of households' debt on consumption, which is in contrast to the implication of standard consumption models that households' debt affect consumption only endogenously through the wealth effect. There are, at least, two reasons why debt may affect consumption independently of the wealth effect: (i) financial institutions may be reluctant to grant new loans to households that are already highly indebted; and (ii) households may target a particular level of leverage with respect to their income/assets. Since these mechanisms operate through the households' balance sheet, this reasoning is usually referred to as the "balance sheet or debt overhang hypothesis". Accordingly, the general decline in asset values prompted by the Great Recession would have left households with relatively large debt levels. Following the previous reasoning, this may have had an impact on household consumption by making it more difficult for households to access new credit (mechanism (i)) or by making households increase their savings or decrease their outstanding debts in order to maintain the desired level of debt relative to their income or assets (mechanism

[1] A key contribution of these studies is to show that the decline in consumption from debt-constrained households cannot be fully compensated by unconstrained households under the presence of nominal rigidities, the zero lower bound on nominal interest rates, or precautionary savings. Hence the aggregate decrease in consumption.

(ii)).

Using a panel of US households, Dynan (2012) finds support to this hypothesis. In particular, highly leveraged households had larger declines in spending between 2007 and 2009, which cannot be explained only through variations in wealth. Along this line, but using State-level data, Albuquerque and Krustev (2018) find modest, but still relevant effects of the US households' deleveraging process on consumption in the aftermath of the housing bubble. For the UK, Kovacs et al. (2018) find that spending cuts associated with debt caused the level of aggregate consumption to fall by around 2%. In a similar vein, McCarthy and McQuinn (2017) explore the consequences of the Irish households' deleveraging process by focusing on the impact of mortgage debt as the key liability in Ireland.

Notwithstanding the previous evidence, another strand of literature points to an alternative relationship between households debt and consumption (Andersen et al., 2016). Under this alternative, households would adjust consumption as a spending normalization process and not because having reached high levels of debt. The idea behind this mechanism is that some households may increase debt to temporarily boost spending above their standard income levels due to easy credit conditions or the acquisition of durable goods. Since such increase in expenditures is only temporary, spending will subsequently drop more for these households than for the others, thereby generating a negative correlation between pre-crisis leverage and consumption growth. This mechanism is usually termed as "the spending normalization hypothesis", with supportive evidence provided by Andersen et al. (2016) for Denmark, and by Svensson (2021a,b) for Australia and the UK, respectively.

In view of these competing explanations, understanding which mechanism is behind the negative relationship between debt and consumption has crucial policy implications. If the debt overhang hypothesis is correct, policies aimed at preventing high levels of debt during expansions, or policies providing debt relief during crises would be effective to decrease the deepness of the recession. On the contrary, under the spending normalization hypothesis, there is no causal relationship between debt and consumption, which implies that debt relief policies would have little impact on consumption.[2]

In this paper, we shed new light on the debt-consumption debate and the channels that drive their varying relationship across business cycle phases and across the distribution of debt throughout households. To conduct the analysis, we use household-level panel data for Spain covering years 2002-2017. Spain represents an ideal case study for several reasons. This period covers the different phases of the business cycle around the Great

[2]A related strand of literature studies how indebtedness affects households' reaction to income or wealth variations in terms of consumption (Mian et al., 2013; Baker, 2018; Christelis et al., 2019; Nakajima, 2020; Sala and Trivin, 2021; Fasianos and Lydon, 2021; Roiste et al., 2021).

Recession, in particular the early 2000s in which Spain experienced significant economic growth and historically low unemployment rates. In addition, the economic success of those years was heavily based on the liberalization of the housing market in a context of very low real interest rates and a banking system that was capable to satisfy the huge increase in credit demand using cheap external funding. This credit supply shock contributed to the significant increase in household debt levels during the expansionary phase of the cycle (from 60% to 90% as a share of the GDP). Some authors have even said that "Spanish housing in the 2000s was the U.S. experience on steroids" (Mian and Sufi, 2015, p. 119). It is in this context that the economic crisis and the decline in asset prices brought by the Great Recession marked the start of households' deleveraging process in Spain.

By analyzing different phases of the business cycle with significant debt level variation, we are able to explore which of the two hypotheses, debt overhang or spending normalization, provides a more plausible account of the facts in Spain, and through which potential channels it operates. More specifically, if households adjust consumption due to debt overhang, we would expect the levels of debt to have a negative impact on consumption in periods combining high levels of debt and a decline in income and asset prices. In contrast, if the adjustment in Spanish households' consumption is related to the spending normalization hypothesis, we should observe that household's consumption does not react to the levels of debt, but to previous increases on this debt. Accordingly, this effect does not need to show up only during a crisis period.

To perform the analysis, we use the Spanish Survey of Household Finances (*Encuesta Financiera de las Familias*, henceforth EFF). The EFF is an official survey conducted by the Bank of Spain every three years that provides detailed information on household consumption, income, assets, liabilities, and socio-economic information regarding every member of the household. Interestingly, it has a panel component that allows us to follow the same household during consecutive waves. This panel structure lets us construct four different panels –for periods 2002-2008, 2005-2011, 2008-2014, and 2011-2017– and explore the relevance of the two competing hypotheses.

Our main finding suggests that high levels of debt have a negative effect on consumption beyond the wealth effect. This result is particularly strong during the Great Recession and its aftermath, a period combining both high leverage and a decrease in asset values. When allowing for non-linearities, we observe that more indebted households show a stronger decrease in consumption. Finally, we find no evidence supporting the negative relationship between previous accumulation of debt and changes in households' consumption. This first set of findings supports the debt overhang hypothesis.

In addition, we also provide evidence that households react more to the level of debt

not-related to the acquisition of real estate assets than to the level of debt associated to such assets. We hypothesize that this result is associated to how easy it is to cancel out different types of debt. That is, given the magnitude and the bureaucracy that usually accompanies debt related to real estate assets, it is possible that highly indebted households pay off earlier their financial debts. Finally, when we explore the potential channels at play, we find no evidence that credit constraints have played a relevant role in shaping households' consumption responses to their level of debt. This last result, along with some heterogeneities regarding households' expectations and levels of income, suggests that consumption responses are more related to households' perceptions about the nature of the crisis than to access to credit itself.

The rest of the paper is structured as follows. Section 2 describes some macroeconomic stylized facts, Section 3 deals with the empirical methodology, and Section 4 presents the results. Section 5 concludes.

2 Macroeconomic patterns in households' consumption and debt

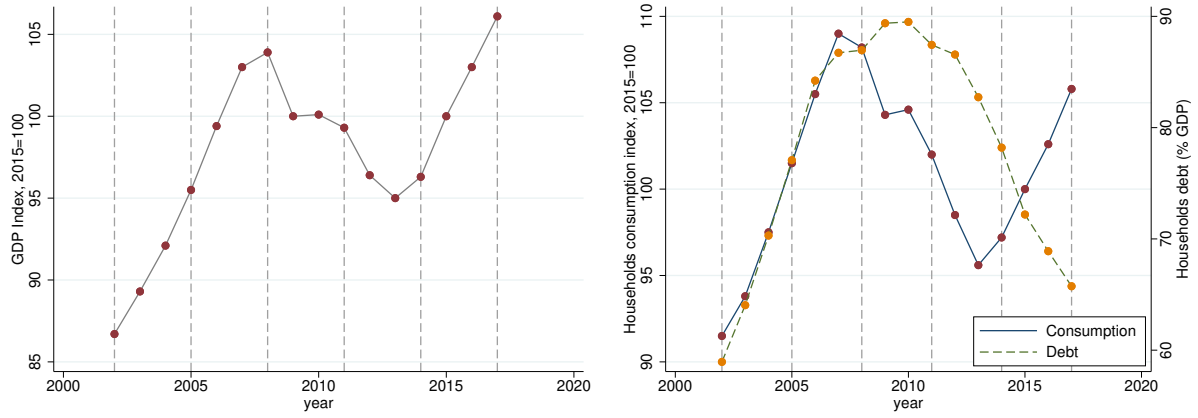
Figure 1.a shows the evolution of Spanish real GDP in 2002-2017 as a normalized index taking value 100 in 2015. Its trajectory is characterized by three business cycle phases starting with a prolonged expansionary period in the early 2000s, a subsequent crisis between 2008 and 2013, and a new expansion 2014 onwards. As we explain below in detail, these important macroeconomic fluctuations are key in the identification of the relevant drivers of the debt-consumption nexus.

Figure 1.b compares households' consumption (as a normalized index taking value 100 in 2015) to the trajectory of households' debt (expressed as percent of GDP). Unsurprisingly, households' consumption mimics GDP's pattern notwithstanding its larger adjustment during the recession. On the contrary, households' debt displays a pronounced hump-shaped trajectory. Debt levels, which were around 60% of GDP in 2002, grew steeply beyond the end of the economic expansion to peak around 90% in 2009/2010. From then onwards, Spanish households experienced a deleveraging process that brought debt back down steadily to a similar value in 2017 than in 2003.

It is worth remarking the parallel trends in households' consumption and debt during the first expansionary phase and the Great Recession, and the subsequent decoupling after 2014. This is due to the nature of the indebtedness process in those years. During the 2000s, among the factors that contributed to the credit expansion in Spain were: (i) the low real interest rate; (ii) the liberalization of the housing market; (iii) the wide availability of external funding; and (iv) the extraordinary low unemployment rate (by

Spanish standards) driven by the construction sector (Jimeno and Santos, 2014). Some authors (Mian et al., 2017; Mian and Sufi, 2018; Mian et al., 2020, 2021) argue that such factors may have also played a role in the debt-driven increase in consumption, which would explain, at least in part, the parallel trends observed before the recession in Figure 1.b. Following their reasoning, it is likely that such debt rise put Spanish households in a particularly delicate situation when the financial crisis caused the collapse of asset prices and economic activity. It is in that context that households started to increase their savings to deleverage and re-balance their financial situation in a process that continued even when households' consumption started rising again since 2014.[3]

Figure 1: Macroeconomic context. 2002-2017



(a) GDP index

(b) Households consumption and debt

Note: The dashed vertical lines highlight the years for which the EFF is available.
Source: Instituto Nacional de Estadística and IMF Global Debt Database.

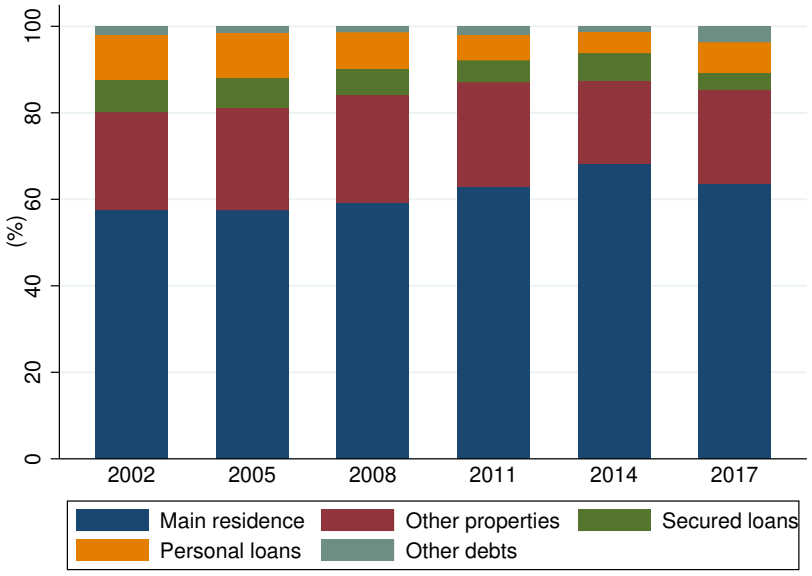
Figure 2 displays the composition of Spanish households' debt over the years.[4] Unsurprisingly, the most important debt components on average, regardless of the year of study, are related to the acquisition of real estate properties: close to 60% of total debt is related to the purchase of the main residence, while around 20% is associated to the acquisition of other properties. The rest of the debt (20% approximately) is made up of loans that are not related to the purchase of real estate, but to personal loans, secured loans, and other debts.[5]

[3]It is worth noting that Spanish law is particularly harsh with regard to foreclosures. In case of eviction, Spanish households remain liable for mortgage repayment even after handing over the keys to the bank. In such context, declines in the value of houses in the aftermath of the Great Recession could have had a particular strong effect on households' consumption when trying not only to avoid foreclosures, but also to re-balance their relative level of debt.

[4]Data comes from the EFF surveys using the full sample available. To obtain the debt composition, we first compute each years' weighted average of the different debt components. Cross-sectional weights are provided by the Bank of Spain following the 2011 Census so as to secure representative statistics at the national level.

[5]The notes in Figure 2 define the different debt components.

Figure 2: Debt composition



Notes: Debt shares are obtained after computing the weighted average of the different debt components. Cross-sectional weights are provided by the Bank of Spain following the 2011 Census so as to provide representative statistics at the national level. "Main residence" accounts for outstanding debts from loans used to purchase the main residence, "Other properties" represents loans used to purchase other real estate properties different from the main residence, "Secured loans" are outstanding debts from mortgages and other secured loans not related to the purchase of real estate assets, "Personal loans" indicates outstanding debts from personal loans, and "Other debts" covers all other debts that do not fit into the previous classifications such as credit card debts, deferred payments, or loans from friends or family.
Source: Encuesta Financiera de las Familias, EFF.

Although these proportions remained stable in the early 2000s, during the expansionary phase of the business cycle, there was a significant change along the deleveraging process that started with the Great Recession. In particular, debt related to the purchase of real estate became more relevant. This is most clearly seen in Figure A.1 in Appendix A, which shows an alternative measure of household indebtedness. In this case, instead of calculating shares from aggregate measures of debt, we first compute household-specific shares and then calculate their averages. This measure does not represent aggregate debt composition, but provides information on households' debt structure. Through this measure, we observe that within households with outstanding leverage, around 60% of their debt is related to the purchase of some real estate property. This percentage increased above 65 % in the post-Great Recession deleveraging period, but fell back to 60% in 2017.

This result may be explained by the nature of the different types of debt. For example, as personal credits tend to have shorter maturities, a rise in the share of loans associated to the purchase of housing is to be expected in times in which it is more difficult to access new credit, as in the aftermath of the Great Recession. In parallel, given that personal loans usually involve lower amounts and less strict cancellation conditions, households

may have chosen voluntarily to reduce their debt on such loans.[6]

3 Data and empirical analysis

3.1 Data and sample selection

As noted, the EFF is an official survey undertaken every three years by the Bank of Spain since 2002 that provides detailed information on households' financial situation. The EFF is particularly suitable for our analysis for two reasons: (i) it has a panel data component that allows us to follow the same household during consecutive waves and (ii) it provides detailed information on non-durable consumption, income, assets and liabilities, along with socio-economic characteristics on all households' members.

This surveys' information is collected through computer-assisted personal interviews between the end of the reference year and the beginning of the following one. Along the lines of the US Board Survey of Consumer Finances (SCF), the EFF oversamples wealthy households to better capture the financial behavior of households at the top of the wealth distribution. In addition, in order to decrease the non-response rate, the Bank of Spain uses stochastic multiple imputation techniques.[7]

We restrict our analysis to households that: (i) are present in the survey in three consecutive waves, at least;[8] (ii) have a reference person aged 25 or over; and (iii) have experienced no significant changes in their structure. The absence of significant changes implies that no additional adults have become part of the household during the examined years, and the reference person is single or lives with the same partner during the whole period.

We further restrict the study to households who own their main residence during the whole period of analysis. The reason is that buying/selling a home is a very important financial decision which usually involves relevant changes in the households' balance sheet (see Figure 2). By restricting the sample in this way, we avoid our results to be driven

[6]Figure A.2 in Appendix A completes the picture by disentangling Figure 2 by wealth quintiles in all available years. We can see that debt related to the main residence is the most important component in the lower part of the wealth distribution regardless of the year under analysis, while the relevance of indebtedness associated to other real estate properties increases over the wealth distribution. It is also worthwhile to point out the falling share of personal loans along with the deleveraging process, which is common to all quintiles of the wealth distribution

[7]Due to the use of multiple imputation techniques, coefficients and standard errors throughout the paper are adjusted accordingly for a correct interpretation of the results. Standard errors are further adjusted using 999 replicate weights provided by the Bank of Spain to account for the stratification and clustering design of the survey. Results presented in the paper are obtained using Stata's *mi* command combined with *svy*.

[8]This restriction is related to our empirical strategy, which is explained below in detail.

by this extraordinary event in the households' life-cycle.[9]

Finally, in order to decrease the influence of outliers, we further exclude households having less than 5,000 euros of yearly non-financial income and more than 10 million euros net wealth. We end up with a total of 4,751 households in our econometric sample.

3.2 Empirical methodology

To assess the influence that different debt mechanisms exert on households' consumption, we estimate an equation such as:

$$\Delta\left(\frac{C_{h,t}}{Y_{h,t}}\right) = \alpha_0 + \alpha_1 \frac{Debt_{h,t-1}}{Y_{t-1}} + \alpha_2 \Delta\left(\frac{Debt_{h,t-1}}{Y_{h,t-1}}\right) + \alpha_3 \Delta\left(\frac{W_{h,t}}{Y_{h,t}}\right) + \alpha_4 \boldsymbol{X_{h,t-1}} + \epsilon_{h,t}, \quad (1)$$

where the dependent variable is the change in non-durable consumption (C) between periods $t-1$ and t, measured relative to households' h non-financial income (Y).[10] Analogously, $\frac{Debt_{h,t-1}}{Y_{t-1}}$ is the debt to income ratio in period $t-1$, $\Delta\left(\frac{Debt_{h,t-1}}{Y_{h,t-1}}\right)$ is the change in the debt to income ratio between periods $t-2$ and $t-1$, and $\Delta\left(\frac{W_{h,t}}{Y_{h,t}}\right)$ accounts for changes in the net wealth to income ratio between $t-1$ and t. $\boldsymbol{X}$ is a vector of control variables; ϵ is a standard disturbance term; and α_1 and α_2 are our parameters of interest. If the debt overhang hypothesis is correct, we expect α_1 to be negative. In contrast, if households' consumption is adjusting due to the spending normalization mechanism, we expect α_2 to be the one exerting a negative impact on households' consumption.[11]

The inclusion of changes in net wealth implies that we study the impact of debt on consumption beyond the wealth effect. In order to identify this relationship, $\boldsymbol{X}$ includes a rich set of controls. In particular, we follow Campos and Reggio (2015) by including lagged-levels of variables that affect the consumption profile of the household and first-differences of variables affecting the level of consumption.

To control for the consumption profile, we include households' characteristics such as size, number of members having a job, number of kids, and years they have been living in the main residence. We also include specific characteristics regarding the head of the household such as categorical variables accounting for 6 different age groups, employment status, health condition, education level, job skills, the presence of the partner in the household, gender, type of job contract, and the economic sector in which she or he

[9] In Appendix B, we show that our results are robust to softening this restriction.

[10] Note that $t-1$ refers to the previous survey wave (3 years before) and not to 1 calendar year prior to time t.

[11] The empirical analysis winsorizes $\Delta\left(\frac{C_{h,t}}{Y_{h,t}}\right)$, $\frac{Debt_{h,t-1}}{Y_{t-1}}$, $\Delta\left(\frac{Debt_{h,t-1}}{Y_{h,t-1}}\right)$, and $\Delta\left(\frac{W_{h,t}}{Y_{h,t}}\right)$ at the 1st and 99th percentiles within each imputation and year. For the sake of presentation, when we present our results, we ignore households subscript h.

works. We also control for their financial situation by including net wealth and income decile dummies.

Changes in the level of consumption are accounted for by including the first differences of households' size, number of members having a job, number of kids, changes in the reference's person health, a dummy indicating if the reference person retired between periods $t-1$ and t and, as already mentioned, the households' net wealth to non-financial income ratio.

To decrease the potential impact of confounding variables, we further include indicators on (i) the risk profile, (ii) credit and liquidity constraints, (iii) consumption of durable goods, (iv) income expectations, and (v) whether current income is above, below, or at the normal level in both t and $t-1$.[12] Not only these variables may be informative on the relevance of the channels they are associated with, but they should also help to isolate the impact of households' debt on consumption. The first variable focuses on households' propensity or aversion to take risks as a potential source of influence over the debt-consumption nexus. The second one accounts for the presence of credit or liquidity constraints, which could clearly exert a direct impact on household's consumption decisions during the examined period. Regarding the consumption of durable goods, it is possible that households are bound to increase their debt to acquire items such as cars or appliances, and this could end up affecting their future consumption path on non-durable goods. The fourth variable is included because household's debt and consumption may be simultaneously driven by future expectations on the state of the economy. Finally, it is important to account for the relative level of income because changes in consumption may be affected by permanent income shocks.

In our empirical analysis, we use the six available EFF waves covering the period 2002-2017. Given that equation (1) includes observations in $t-2$ and t, we create 4 different panels using households present in at least 3 consecutive survey waves: 2002-2008, 2005-2011, 2008-2014, and 2011-2017.

4 Results

In this Section, we exploit information on changes over the business cycle to assess how debt affects consumption. Examining this time variation should help us identify the different mechanisms at play, as debt overhang should be more relevant in a situation where households have high levels of leverage and asset prices are falling (i.e., in 2005-2011 and 2008-2014). We present some baseline results first, which are followed by a

[12] Table A.1 in Appendix A defines these indicators. Table A.2 in Appendix A presents summary statistics of all the variables used in our analysis.

further exploration on the existence of non-linearities, differences by type of debt, and other potential heterogeneities that underlie the varying debt-consumption nexus.

4.1 Baseline results

Table 1 displays our baseline results in four blocks corresponding to the evidence retrieved from the four panels we work with. Each block contains a comprehensive combination of specifications, whose results are reported in the different columns so as to check on the sensitivity of the baseline relationship between consumption and debt. Column [1] controls for changes in the wealth to income ratio and the level of debt. Column [2] further accounts for wealth and income deciles in $t-1$. Column [3] incorporates the rest of controls described in Section 3. The specification in column [4] includes all previous controls but considers past changes in debt instead of the level of debt in $t-1$. Finally, in our reference specification (column [5]), we still keep the previous controls and consider both the past changes and debt levels in $t-1$ to try to disentangle the relevant mechanism behind the debt-consumption nexus.

Given the time period of the dependent variable in each panel (the change in consumption in 2005-2008, 2008-2011, 2011-2014, and 2014-2017, respectively), we take the results in Panels A and D as broadly representative of an expansionary situation, while those in Panels B and C cover the Great Recession and its aftermath.[13]

One salient characteristic of the results throughout is the stability of the wealth coefficient, according to which 1-euro increase in wealth is to be systematically associated to 0.5-0.7 cents rise in consumption.[14] This stability contrasts with the results on the influence of debt.[15]

The level of debt is an important determinant of households' consumption decisions with an influence that varies over the business cycle. For example, Panel A covers an expansionary business phase in which the level of debt fails to exert a significant downward influence on households' consumption. This changes in Panels B to D, for which a varying

[13]Note that households that took part in the EFF 2008 were interviewed between the last quarter of 2008 and the first of 2009, with the Great Recession hitting hard the Spanish economy (see Figure 1.a).

[14]Changes in households' wealth are the result of both asset price variations and decisions on households' portfolio. While the former can be considered exogenous, the latter is negatively correlated with households' consumption. As a consequence, the estimated wealth effect must be considered a lower bound (see Trivin, 2021).

[15]In his comment on Dynan (2012), Atif Mian highlights that a high correlation between leverage and changes in wealth could be problematic regarding the estimation of an equation such as (1). Table A.3 in Appendix A shows the results from a different version of equation (1) where changes in wealth substitute changes in consumption as the dependent variable. These results show no significant relationship between the level of leverage in $t-1$ and changes in wealth from $t-1$ to t regardless of the period under analysis and the set of controls included in the regression. This suggests that the correlation between debt and wealth is a minor issue in our analysis and should not affect our results.

but consistent negative impact is found. In particular, we observe that a 1-euro increase in the level of debt in 2008 decreases households' consumption by 2.7 cents between 2008 and 2011. A similar impact is found in the following period (Panel C), where a 1-euro higher debt in 2011 is associated with 3.1 less cents in consumption. A negative impact of debt on consumption is also found for the last panel of our sample, which covers again an expansionary business cycle. In this case, a 1-euro increase in the level of debt in 2014 relates to a smaller, but still significant 1.2 cents decrease in consumption. Regarding the other debt component in the model, the lagged change in debt, not only it does not affect the impact of debt levels on consumption, but once we account for households' debt levels, it simply has no impact on consumption (columns [5] in all panels).

Altogether, we find evidence of debt having an effect on consumption beyond the wealth effect. This effect is compatible with the debt overhang hypothesis for a variety of reasons: (i) falling households' consumption is associated to the level of debt; (ii) the absence of a significant impact of debt in the expansion before the Great Recession, when Spanish households were much less indebted; and (iii) a larger effect during the recession, when coinciding with high levels of debt and a decline in asset prices and income. On the contrary, we find no evidence supporting that households behave according to a spending normalization process.

4.2 Non-linearities

Table 2 studies the existence of non-linearities in the consumption-debt relationship. Under the premise that debt overhang drives our results, we expect that the larger the households' leverage is the more they will tend to cut on consumption expenditures.

To conduct this analysis, we substitute the debt variables in equation (1) for categorical debt variables defined as follows: $DEBT_{t-1}$ is a dummy that takes value 1 if the household has outstanding debts; HDI^{50}_{t-1} is a dummy accounting for households with a debt to non-financial income ratio above the median of households having debts; and HDI^{75}_{t-1} is a dummy accounting for the top quartile within the distribution of households having outstanding debts. With HDI^{50}_{t-1} and HDI^{75}_{t-1}, we aim to account specifically for households that are in the upper part of the debt distribution. In addition, $\Delta\frac{DEBT_{t-1}}{Y_{t-1}} < 0$ and $\Delta\frac{DEBT_{t-1}}{Y_{t-1}} > 0$ indicate if households' debt has increased or decreased (with respect to the reference situation in which debt is held constant) between period $t-2$ and $t-1$.

The simple fact of being indebted is in general not relevant as a determinant of household consumption, with only one exception when not accounting for previous changes in debt in Panel A (2002-2008). Thereafter (i.e., for the next two panels, B and C, in which the situation was of high and relatively stable debt levels), we observe a larger negative impact on consumption the larger households' indebtedness levels are. Hence, from a dif-

Table 1: Baseline results

	Panel A: 2002-2008					Panel B: 2005-2011				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.007	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.007	–0.008	–0.010		–0.002	–0.015	–0.021	–0.028		–0.027
	(0.012)	(0.012)	(0.012)		(0.015)	(0.008)*	(0.008)**	(0.009)***		(0.009)***
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$				–0.014	–0.013				–0.010	–0.003
				(0.012)	(0.014)				(0.008)	(0.008)
Constant	–0.004	–0.099	–0.148	–0.165	–0.163	0.016	–0.049	0.180	0.099	0.176
	(0.012)	(0.044)**	(0.109)	(0.108)	(0.110)	(0.010)*	(0.034)	(0.094)*	(0.093)	(0.095)*
Observations	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653
	Panel C: 2008-2014					**Panel D: 2011-2017**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.006	0.005	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.022	–0.029	–0.034		–0.031	–0.011	–0.012	–0.013		–0.012
	(0.008)***	(0.008)***	(0.009)***		(0.011)***	(0.005)**	(0.005)**	(0.006)**		(0.006)*
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$				–0.023	–0.006				–0.009	–0.005
				(0.010)**	(0.011)				(0.007)	(0.007)
Constant	0.042	–0.028	0.272	0.142	0.262	–0.049	–0.092	0.161	0.087	0.156
	(0.012)***	(0.050)	(0.098)***	(0.094)	(0.101)***	(0.012)***	(0.053)*	(0.111)	(0.102)	(0.110)
Observations	954	954	954	954	954	1008	1008	1008	1008	1008
Wealth FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Income FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls.

ferent angle than in Section 4.1, our results confirm that the negative relationship between debt and consumption is tighter the larger the level of indebtedness is.

A close look at the coefficients sheds light on the strengthened negative association between debt and consumption. During the crisis (Panels B and C for 2005-2011 and 2008-2014) household debt levels above the median are associated to a fall in consumption. This fall becomes more intense as the crisis persists, with a drop in consumption evolving from -5.5 cents to a range between -8.1 and -8.9 cents (columns [3] and [4] in Panels B and C). When the recovery starts (panel 2011-2017), this range diminishes to an interval between -6.0 and -7.8 cents (columns [3] and [4] in Panel D). When we turn to households at the top quartile of the debt distribution, we find again that high levels of debt are associated with declines in consumption only since the Great Recession. In this case, however, the initial impact is almost twice the one observed for households above the median of the debt distribution (-9.4 cents, as shown in columns [5] and [6] in Panel B). Then, there is a steep increase to a range between -11.5 and -12.2 cents (columns [5] and [6] in Panel C), and a subsequent rapid fall to a non-significant effect (columns [5] and [6] in Panel D).

Interestingly, we observe that households that increased their debt in the previous period experience larger consumption declines during expansions. In particular, for the panel 2002-2008, households increasing their debt between 2002 and 2005 show a larger decrease in consumption which attains more than 6 cents (columns [4] and [6], Panel A). Something similar is observed for the period 2011-2017 with an impact estimated between 4.6 (non-significant) and 8.8 cents (columns [2] and [4], Panel D).

Overall, these findings are compatible with the debt overhang hypothesis driving our results in periods characterized by decreasing asset prices and high leverage, while they do not discard that the spending normalization hypothesis may play a role in expansionary periods. In addition, it is worth noting that in 2005-2011 households that had deleveraged during the previous years experienced an increase in consumption. This result highlights the varying relationship between debt and consumption over the business cycle.[16]

4.3 Type of debt

In this section, we classify households' debt according to the purpose for which it is granted. The "real component" (or "real debt"), $\frac{Debt^{real}}{Y}$, contains all debts associated to

[16]Throughout the paper, we use the debt to income ratio as a measure of leverage for two reasons: (i) it is a measure of total households' debt and (ii) it shares the denominator with the other variables of interest in equation (1), which facilitates the interpretation of the coefficients. Appendix B shows that our results are robust to two alternative measures of leverage: debt service to income, and loan to value. The latter is defined as the ratio of total debt to the value of the main residence. We further show that neither the inclusion in the sample of households who rent nor those not owning the same main residence during the whole period alters our results.

Table 2: Non-linearities

	Panel A: 2002-2008						Panel B: 2005-2011					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
DEBT_{t-1}	–0.053	–0.008					–0.015	–0.029				
	(0.026)**	(0.038)					(0.021)	(0.031)				
HDI^{50}_{t-1}			–0.049	–0.020					–0.054	–0.056		
			(0.033)	(0.036)					(0.025)**	(0.027)**		
HDI^{75}_{t-1}					–0.071	–0.046					–0.095	–0.094
					(0.047)	(0.048)					(0.035)***	(0.037)**
$\frac{DEBT_{t-1}}{Y_{t-1}} < 0$		–0.032		–0.033		–0.034		0.049		0.042		0.038
		(0.032)		(0.028)		(0.028)		(0.030)		(0.023)*		(0.023)*
$\frac{DEBT_{t-1}}{Y_{t-1}} > 0$		–0.068		–0.065		–0.062		0.010		0.011		0.010
		(0.046)		(0.034)*		(0.032)*		(0.038)		(0.028)		(0.027)
Constant	–0.142	–0.139	–0.137	–0.132	–0.138	–0.127	0.111	0.099	0.145	0.130	0.157	0.141
	(0.109)	(0.109)	(0.111)	(0.112)	(0.107)	(0.108)	(0.093)	(0.093)	(0.095)	(0.095)	(0.094)*	(0.094)
Observations	1136	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653	1653
	Panel C: 2008-2014						**Panel D: 2011-2017**					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
DEBT_{t-1}	–0.029	0.008					–0.032	0.019				
	(0.028)	(0.039)					(0.027)	(0.039)				
HDI^{50}_{t-1}			–0.089	–0.081					–0.078	–0.060		
			(0.036)**	(0.036)**					(0.032)**	(0.035)*		
HDI^{75}_{t-1}					–0.122	–0.115					–0.027	–0.004
					(0.049)**	(0.049)**					(0.037)	(0.039)
$\frac{DEBT_{t-1}}{Y_{t-1}} < 0$		–0.024		–0.006		–0.013		–0.036		–0.016		–0.024
		(0.037)		(0.028)		(0.028)		(0.032)		(0.026)		(0.027)
$\frac{DEBT_{t-1}}{Y_{t-1}} > 0$		–0.066		–0.020		–0.019		–0.088		–0.046		–0.070
		(0.049)		(0.035)		(0.033)		(0.045)*		(0.036)		(0.034)**
Constant	0.145	0.147	0.199	0.199	0.206	0.210	0.107	0.121	0.141	0.155	0.103	0.128
	(0.095)	(0.095)	(0.095)**	(0.096)**	(0.096)**	(0.097)**	(0.105)	(0.105)	(0.106)	(0.107)	(0.106)	(0.109)
Observations	954	954	954	954	954	954	1008	1008	1008	1008	1008	1008
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. $DEBT_{t-1}$ is a dummy that takes value 1 if the household has any outstanding debt. HDI^{50}_{t-1} is a dummy accounting for households with a debt to non-financial income ratio above the median of households having any debt. HDI^{75}_{t-1} is a dummy accounting for the top quartile within the distribution of households having an outstanding debt. $\frac{DEBT_{t-1}}{Y_{t-1}} < 0$ and $\frac{DEBT_{t-1}}{Y_{t-1}} > 0$ indicate if households' debt has decreased or increased between period $t-2$ and $t-1$.

the purchases of real estate assets, while the "financial component" (or "financial debt"), $\frac{Debt^{fin}}{Y}$, includes the leverage associated to all remaining debts: secured loans, personal loans, credit card balances, and other debts.

There are several reasons why the response of consumption expenditures to the level of debt may be different across these types of debt. First, financial debts, such as overdrafts or credits related to households' consumption, are inherently cancelled more easily than real debt products. Second, financial debt is relatively less important in magnitude than real debt (as shown in Figure 2). Third, real debt, such as 20- and 30- year mortgages, is likely to entail extra costs if the consumer wants to payback the principal in advance. Finally, real debt is more predictable in the sense that its longer maturity allows it to be naturally internalized in inter-temporal household consumption decisions.

As Table 3 shows, our baseline results are robust for the two debt components along the four examined periods. During the 2002-2008 expansion, there is no evidence of a debt level effect on consumption no matter the type of debt considered (Panel A). This is in contrast with the significant influence of both real and financial debt during the crisis in 2005-2011 and 2008-2011 (Panels B and C), with consumption being more sensitive to financial debt during the first crisis period. In response to a rise in financial debt, consumption goes down by 7.5 cents in 2005-2011 (column [5] in Panel B), while in 2008-2011 this impact is only significant when previous changes in debt are not accounted for, in which case consumption declines by 4.6 cents (column [3] in Panel C). Regarding real debt, we find a persistent decline in consumption that amounts to 2.0 and 2.6 cents during the crisis periods (column [5] in Panels B and C, respectively) and 1.3 cents in the last expansionary period (Panel D). As in our previous results, changes in households' debt in past periods are not relevant in determining consumption once we control for the level of debt.

These results indicate that households with larger levels of financial debt decrease consumption more intensively than households with larger levels of real debt, and add to our previous findings to establish that both the quantity of debt and its composition matters: not only consumption decreases more than proportionally the larger households' leverage is, but also the larger is the share of financial debt they hold relative to real debt.

4.4 Heterogeneities

So far, we have assumed that every household adjusts consumption homogeneously in response to debt. In this Section, we try to shed light on the mechanisms behind the debt-consumption nexus by relaxing this assumption and explore the existence of hetero-

Table 3: Type of debt

	Panel A: 2002-2008					**Panel B: 2005-2011**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.007	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$	–0.016	–0.018	–0.029		0.003	–0.040	–0.050	–0.063		–0.075
	(0.030)	(0.030)	(0.028)		(0.047)	(0.022)*	(0.022)**	(0.022)***		(0.025)***
$\frac{Debt^{real}_{t-1}}{Y_{t-1}}$	–0.006	–0.008	–0.008		–0.010	–0.013	–0.020	–0.026		–0.020
	(0.015)	(0.015)	(0.016)		(0.018)	(0.009)	(0.009)**	(0.010)***		(0.010)**
$\Delta\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$				–0.032	–0.035				–0.007	0.012
				(0.028)	(0.048)				(0.015)	(0.015)
$\Delta\frac{Debt^{real}_{t-1}}{Y_{t-1}}$				–0.003	0.002				–0.022	–0.016
				(0.013)	(0.015)				(0.011)**	(0.011)
Constant	–0.003	–0.097	–0.150	–0.161	–0.151	0.018	–0.047	0.179	0.101	0.167
	(0.012)	(0.044)**	(0.109)	(0.108)	(0.110)	(0.010)*	(0.034)	(0.093)*	(0.092)	(0.093)*
Observations	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653
	Panel C: 2008-2014					**Panel D: 2011-2017**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.006	0.005	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$	–0.041	–0.045	–0.046		–0.038	–0.014	–0.012	–0.010		–0.019
	(0.022)*	(0.021)**	(0.023)**		(0.045)	(0.020)	(0.020)	(0.020)		(0.024)
$\frac{Debt^{real}_{t-1}}{Y_{t-1}}$	–0.017	–0.026	–0.031		–0.026	–0.011	–0.012	–0.014		–0.013
	(0.009)*	(0.010)***	(0.011)***		(0.012)**	(0.005)**	(0.006)**	(0.007)**		(0.007)*
$\Delta\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$				–0.035	–0.009				0.007	0.017
				(0.020)*	(0.040)				(0.027)	(0.032)
$\Delta\frac{Debt^{real}_{t-1}}{Y_{t-1}}$				–0.025	–0.010				–0.010	–0.007
				(0.012)**	(0.013)				(0.007)	(0.008)
Constant	0.040	–0.031	0.256	0.138	0.244	–0.049	–0.091	0.163	0.092	0.166
	(0.012)***	(0.050)	(0.102)**	(0.095)	(0.103)**	(0.012)***	(0.053)*	(0.112)	(0.101)	(0.111)
Observations	954	954	954	954	954	1008	1008	1008	1008	1008
Wealth FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Income FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$, $\frac{Debt^{real}_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt^{real}_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls.

geneities across different households' and debt characteristics.[17]

To do so, we estimate a version of equation (1) such as:

$$\Delta\left(\frac{C_{h,t}}{Y_{h,t}}\right) = \beta_0 + \beta_1 \frac{Debt_{h,t-1}}{Y_{t-1}} * Z_{h,t-1} + \beta_2 \Delta\left(\frac{Debt_{h,t-1}}{Y_{h,t-1}}\right) + \beta_3 \Delta\left(\frac{W_{h,t}}{Y_{h,t}}\right) + \beta_4 \boldsymbol{X_{h,t-1}} + \beta_5 \frac{Debt_{h,t-1}}{Y_{t-1}} + \beta_6 Z_{h,t-1} + \varepsilon_{h,t}, \tag{2}$$

where Z represents the set of variables for which we study the presence of heterogeneities, and β_1 is our variable of interest as it accounts for the existence of differences in the debt-consumption relationship due to Z. We will also pay attention to β_5, which represents the effect of the level of debt when $Z = 0$.

4.4.1 Household characteristics

Following the theoretical predictions of the literature, we first study the role played by income expectations, credit constraints, risk propensity, and consumption of durable goods.

We start by considering the possibility that the negative relationship between debt and consumption is shaped by households' income perspectives. In such case, the existence of positive expectations would lead them to decrease consumption by less than otherwise for a given debt level. To obtain empirical evidence on the effect of income expectations, we interact the level of debt with two dummies, one that selects households that in $t-1$ were expecting larger future income, and another one that selects households whose income expectations went down between $t-1$ and t.

Another possibility is that highly leveraged households are forced to decrease consumption in economic downturns on account of the increasing difficulties they face to access new credit. To assess the role played by credit and liquidity constraints we interact the level of debt with a dummy variable that takes value 1 if the household had problems either getting a new loan or paying back an existing one in the years before $t-1$. We further check the relevance of liquidity constraints in a more general way by interacting debt with the two groups of households most likely affected by such constraints in $t-1$: (i) households belonging to the bottom three income deciles; and (ii) households with a net financial wealth smaller than two months of non-financial income.

Next, we consider the investment risk profile of the household's head, as households with heterogenous beliefs may deliberately choose to load up on idiosyncratic risk that they are more optimistic about (Mian et al., 2013). Hence, for the impact of risk prefer-

[17] In view of the previous results, which identify the level of debt as the main driver in the debt-consumption nexus, from now on we focus our analysis on this variable.

ences, we interact the households' debt level with a dummy indicating if the household's bread winner is willing to take financial risks when investing.

Finally, we test if the acquisition of durable goods at $t-1$ is related to changes in households' consumption as suggested by the spending normalization hypothesis.[18]

It is also possible that changes in precautionary saving motives affect households' decisions. Unfortunately, the data used does not allow an explicit measure of precautionary savings, although this should be partly embodied in variables such as income expectations and being at the bottom of the income distribution.

Table 4 shows some interesting results. First of all, we do not find that households facing credit or liquidity constraints react in a different way than non-constrained households. As this result holds regardless of the period of analysis, the lack of access to new credit does not appear as a critical determinant of the negative debt-consumption relationship. For the specific period of 2005-2011, we find that low-income families reduce their consumption by 2.7 cents further than non-low-income households (column [4] in Panel B). Although this result could be related to liquidity or credit constraints, the lack of significance of our explicit proxy seems to point to other factors, among which is the possibility that low-income households have larger precautionary saving motives. Moreover, the fact that credit constraints are not found relevant aligns well with the behavior of more optimistic households (i.e., households with larger income expectations), for which debt levels did not affect consumption either, when the crisis arrived. The fact that this behavior can only be identified for the 2005-2011 panel, when the crisis first struck, reinforces our belief that consumption responses are more related to households' perceptions about the nature of the crisis than to access to credit itself.

We also find that financial risk preferences have a relevant impact on the debt-consumption nexus, as households whose reference person is willing to take risks decrease their consumption in response to the level of debt by 2.9 and 4.7 additional cents, respectively, during the recession periods (column [6] in Panels B and C). This result is compatible with various explanations. For example, it could signal the relevance of households' portfolio composition in determining consumption, as further exposure to risk investments may be relevant to shape consumption patterns during the crisis.[19] In addition, this result could be partially explained by credit constraints affecting more this group, as they have a higher propensity to resort to financial products than households that are relatively more risk-averse. Table A.4 in Appendix A provides descriptive evidence comparing households' characteristics between the two groups showing that households that are willing to take financial risks have a larger share of their wealth invested in financial assets and

[18] The notes in Table 4 provide further information on the variables used in this Section.

[19] See Zhang et al. (2021), who show how different risk attitudes deliver different consumption outcomes as they affect the way households smooth consumption intertemporally.

are less likely to have suffered from credit and liquidity constraints recently. We need to acknowledge, however, that these situations are to some extent driven by the fact that riskier households are wealthier than non-riskier households with twice the net wealth, on average, regardless of the period under consideration.[20] Interestingly, we also observe that riskier households have much larger debts across the different panels, which seems to indicate that the larger decrease in consumption from these households is closely related to the non-linear relationship between debt and consumption examined in Section 4.2.

Regarding the effect of extraordinary expenditures on durable goods, we observe that the level of debt has a significant contribution in cutting back consumption only in 2002-2008 for households that bought a durable good in $t-1$ (column [7] in Panel A). The timing of this result makes it compatible with the spending normalization hypothesis highlighted by Andersen et al. (2016).

4.4.2 Debt characteristics

Given that debts related to real assets have more persistent effects on consumption (as shown in Section 4.3) and in view that loans related to the acquisition of the main residence have the largest share on total loans (as shown in Figure 2) in this section we look at how loan's characteristics affect household consumption, paying particular attention to those related to the main residence. For the sake of space, the results are displayed in the Appendix (Tables A.5–A.8), while here we discuss the main findings.

First, we focus on characteristics related to the most important outstanding loan used to buy the main residence. Accordingly, as presented in the corresponding columns, we consider [1] the fact of having an outstanding loan on the main residence; [2] its annual interest rate; and [3] the type of interest rate (fixed or variable). Second, we turn to all outstanding loans related to the acquisition of the main residence. In particular on: [4] weighted years to maturity; and [5] pending amount as a share of the initial loan. Third, we consider a specific characteristic related to [6] the share of pending total debt subject to a fixed interest rate. The expansive monetary policies followed by the ECB in the aftermath of the Great Recession dropped nominal interest rates. This situation had the potential to create relevant asymmetries in debt' repayments (for a given level of debt) across households with debt shares more or less subject to fixed or variable interest rates (Jappelli and Scognamiglio, 2018). Finally, we also check as a proxy of speculators, whether households buying and/or selling properties in recent years that were not their main residence had a different consumption reaction. We thus consider: [7] whether the

[20] Given that we consider riskier households the ones that are willing to take some risk in financial investments and that financial assets are mostly concentrated in wealthier households, it comes as no surprise that riskier households are richer than non-riskier ones.

Table 4: Heterogeneities

	Panel A: 2002-2008							Panel B: 2005-2011						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	0.003	–0.003	–0.004	0.009	0.001	–0.013	0.034	–0.034	–0.027	–0.025	–0.021	–0.024	–0.018	–0.031
	(0.016)	(0.018)	(0.016)	(0.016)	(0.020)	(0.016)	(0.022)	(0.010)***	(0.009)***	(0.010)**	(0.011)*	(0.012)*	(0.012)	(0.014)**
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–0.012	–0.012	–0.013	–0.015	–0.013	–0.012	–0.009	–0.003	–0.003	–0.003	–0.003	–0.003	–0.002	–0.003
	(0.015)	(0.015)	(0.015)	(0.014)	(0.014)	(0.015)	(0.014)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
$\frac{Debt_{t-1}}{Y_{t-1}} * Expect^L_{t-1}$	–0.020							0.039						
	(0.023)							(0.019)**						
$\frac{Debt_{t-1}}{Y_{t-1}} * \downarrow Expect_t$		0.003							0.001					
		(0.020)							(0.018)					
$\frac{Debt_{t-1}}{Y_{t-1}} * Constraints_{t-1}$			0.025							–0.011				
			(0.026)							(0.018)				
$\frac{Debt_{t-1}}{Y_{t-1}} * Y^{Low}_{t-1}$				–0.031							–0.027			
				(0.022)							(0.015)*			
$\frac{Debt_{t-1}}{Y_{t-1}} * \frac{W^{fin\,Low}_{t-1}}{Y_{t-1}}$					–0.006							–0.009		
					(0.022)							(0.015)		
$\frac{Debt_{t-1}}{Y_{t-1}} * Risk_{t-1}$						0.024							–0.029	
						(0.023)							(0.015)**	
$\frac{Debt_{t-1}}{Y_{t-1}} * Durable_{t-1}$							–0.048							0.007
							(0.025)*							(0.015)
Constant	–0.157	–0.179	–0.171	0.044	–0.177	–0.168	–0.194	0.161	0.169	0.158	0.380	0.154	0.138	0.153
	(0.111)	(0.115)	(0.118)	(0.144)	(0.118)	(0.118)	(0.119)	(0.096)*	(0.098)*	(0.098)	(0.115)***	(0.100)	(0.100)	(0.099)
Observations	1136	1136	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653	1653	1653

Table 4 (cont.): Heterogeneities

	Panel C: 2008-2014							Panel B: 2011-2017						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[1]	[2]	[3]	[4]	[5]	[6]	[7]
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.029	–0.031	–0.030	–0.032	–0.037	–0.019	–0.028	–0.014	–0.014	–0.015	–0.005	–0.008	–0.014	–0.018
	(0.012)**	(0.012)***	(0.011)***	(0.011)***	(0.013)***	(0.010)*	(0.012)**	(0.007)*	(0.007)**	(0.007)**	(0.008)	(0.008)	(0.007)**	(0.008)**
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–0.006	–0.005	–0.006	–0.006	–0.007	–0.008	–0.006	–0.005	–0.005	–0.005	–0.003	–0.004	–0.005	–0.005
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)	(0.011)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
$\frac{Debt_{t-1}}{Y_{t-1}} * Expect^L_{t-1}$	–0.006							0.007						
	(0.016)							(0.011)						
$\frac{Debt_{t-1}}{Y_{t-1}} * \downarrow Expect_t$		–0.003							0.008					
		(0.019)							(0.010)					
$\frac{Debt_{t-1}}{Y_{t-1}} * Constraints_{t-1}$			–0.003							0.011				
			(0.020)							(0.012)				
$\frac{Debt_{t-1}}{Y_{t-1}} * Y^{Low}_{t-1}$				0.004							–0.018			
				(0.017)							(0.012)			
$\frac{Debt_{t-1}}{Y_{t-1}} * \frac{W^{fin\ Low}_{t-1}}{Y_{t-1}}$					0.011							–0.009		
					(0.015)							(0.011)		
$\frac{Debt_{t-1}}{Y_{t-1}} * Risk_{t-1}$						–0.047							0.009	
						(0.018)***							(0.012)	
$\frac{Debt_{t-1}}{Y_{t-1}} * Durable_{t-1}$							–0.006							0.014
							(0.015)							(0.009)
Constant	0.254	0.234	0.237	0.519	0.242	0.211	0.244	0.155	0.139	0.136	0.424	0.125	0.132	0.119
	(0.100)**	(0.102)**	(0.106)**	(0.125)***	(0.106)**	(0.102)**	(0.108)**	(0.109)	(0.111)	(0.114)	(0.136)***	(0.113)	(0.113)	(0.112)
Observations	954	954	954	954	954	954	954	1008	1008	1008	1008	1008	1008	1008
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. $Expect^L_{t-1}$ is a dummy that takes value 1 if households expect their future income to be larger in the future. $\downarrow Expect_t$ is a dummy indicating that households have decreased their income expectations between $t-1$ and t. $Constraints_{t-1}$ accounts for households credit and liquidity constraints as defined in Table A.1 in Appendix A. Y^{Low}_{t-1} and $\frac{W^{fin\ Low}_{t-1}}{Y_{t-1}}$ account, respectively, for households belonging to the bottom 3 income deciles and with a net financial wealth smaller than 2 months of non-asset income. $Risk_{t-1}$ indicates if the reference person is willing to take take financial risks when investing as defined in Table A.1 in Appendix A. $Durable_{t-1}$ takes value 1 if households bought a durable good as defined in Table A.1 in Appendix A.

household acquired other real estate properties between $t-2$ and $t-1$ or owns more than three other real estate properties; and [8] whether the household sold at least one real estate property in the year before $t-1$ in addition to meeting [7].[21]

The first interesting result is that none of these characteristics seem to be the main driver of the negative debt-consumption relationship. In other words, if we focus on the impact of debt when $Z = 0$ (e.g., β_5 in equation (2)), the results are qualitatively the same as the ones obtained in Section 4.1. This suggests that the more persistent impact on consumption of real estate related debt is inherent to that type of debt.

Notwithstanding the absence of relevant heterogeneities related to the loans dedicated to buy the main residence, for the panel 2008-2014 we observe that (i) households without fixed interest rate loans in 2011 decrease their consumption by 2.7 cents for every extra euro of debt; and (ii) this response reaches 5.5 cents if the household has 100% of its debt under a fixed interest rate (column [6] in Table A.7). Hence, in a context where the interest rates have fallen and households with flexible interest rate loans automatically enjoy this decline, every 10 percentage points of larger exposure to fixed interest rates decreases consumption by 0.028 further cents.

All in all, our results suggest that the decline in consumption associated to high levels of debt is not explained by specific characteristics of the loans, and that the previous differences observed between financial and real estate assets are inherent to those specific debts. However, we also observe that changes in the interest rates associated to those debts could have important effects on households' consumption decisions.

5 Conclusions

The Great Recession spurred a large body of literature trying to understand the role that household balance sheets play on consumption decisions. Although some recent papers have empirically found a negative relation between debt and consumption, the underlying mechanisms are still unclear. One strand of the literature claims that the negative relationship is due to a debt overhang causing households to reduce consumption due to a combination of high levels of debt along with a decreasing value of their assets. Another strand of literature, however, has argued that this negative relationship is not due to a causal effect, but rather to a spurious correlation. Under this last reasoning, households may get indebted to fund extraordinary increases in consumption due, for example, to easy access to credit or to the acquisition of durable goods. As a consequence, the negative relationship between debt and consumption is only related to the normalization of

[21] The specific definition of the variables included in the analysis can be found in the notes of Tables A.5–A.8 in Appendix A.

households' expenditure in the following period.

In this paper, we have studied the debt-consumption nexus in Spain in the pre- and post-Great Recession years. Spain is a very interesting case study because households' leverage skyrocketed along the development of a real estate bubble in the years preceding the economic recession. The situation in the aftermath of the Great Recession was characterized by high leverage and falling values of households' assets. It is in this context that the debt level contributes to decrease consumption beyond the wealth effect. In contrast, past accumulation of debt fails to exert a negative effect on consumption and leads our findings to support the debt overhang hypothesis.

We further found evidence of non-linearities, with more indebted households decreasing more intensively their consumption, and faster consumption adjustment in response to debt that is not-related to the acquisition of real estate assets. This last result is compatible with the enhanced easiness to cancel out this kind of debt not only because of its economic feasibility, but also because it is technically straightforward. Finally, when we analyzed potential heterogeneities, we found no evidence that credit constraints played an important role in the reaction of consumption to the level of debt.

Our findings imply that policies aimed at relieving households from their high leverage in recessive periods should be useful to foster aggregate consumption. However, because of the close relationship between debt and asset prices during the expansionary phase of the cycle, policies preventing households from attaining such high leverage are likely to be even more efficient.

Importantly, the heterogeneous results observed across countries highlights the critical role of the policy maker in identifying the origins of the crisis, as policies facing a debt overhang problem would be efficient in the case of a household debt-driven recession, while they could have little impact if the recession was mainly originated by other factors.

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APPENDIX A: Supplementary tables and figures

Table A.1: Definition of selected variables

Variable	Definition
Risk	Our categorical variable takes value 1 if households describe themselves as willing to run on any kind of risk in the expectation of obtaining the corresponding profit, 0 otherwise.
Constraints	A household is considered constrained if: i) in the last two years they did not ask a credit because they think it would be turned down, ii) in the last two years they have been denied a loan, iii) in the last two years they have been granted a loan for an amount less than that they requested, or iv) in the last twelve months the household have had financial difficulties which resulted in the delay of the payment of any debt.
Level of income	The variable takes value: i) 0 if households define their current level of income as normal, ii) 1 if households define their current level of income as higher than usual, and iii) 2 if they define their current income as lower than usual.
Income expectations	Our categorical variable takes value: i) 0 if households expect their future income to be the same as at present, ii) 1 if households expect their future level of income to be higher than at present, and iii) 2 if they expect a future income lower than at present.
Durables	Our categorical variable takes value 1 if in the last twelve months the household has: i) carried any refurbishment work on the main residence, ii) bought any furnishings, fittings or appliances for its real estate properties, iii) bought any new cars, or iv) bought any means of transport (excluding cars).

Table A.2: Descriptive statistics: Baseline sample

		2002-2008	2005-2011	2008-2014	2011-2017
	Monetary variables (mean)				
	Net total wealth$_{t-1}$	666,560	715,190	687,764	814,363
	Non-durable consumption$_{t-1}$	16,376	16,660	16,689	18,442
	Non-financial income$_{t-1}$	38,468	42,623	39,752	39,634
	Total debt$_{t-1}$	24,495	28,245	34,822	37,813
	Real assets debt$_{t-1}$	16,963	22,441	28,975	32,070
	Financial assets debt$_{t-1}$	7,532	5,804	5,847	5,743
	Variables used in our baseline model (mean)				
	$\Delta \frac{C_t}{Y_t}$	0.002	-0.006	0.017	-0.060
	$\Delta \frac{W_t}{Y_t}$	1.432	-1.801	-0.830	0.104
	$\frac{Debt_{t-1}}{Y_{t-1}}$	0.590	0.697	0.934	1.120
	$\Delta \frac{Debt_{t-1}}{Y_{t-1}}$	0.085	-0.157	0.025	-0.173
	Households composition				
	Δ #Size$_t$	-0.186	-0.126	-0.107	-0.112
	#Size$_{t-1}$	2.854	2.758	2.634	2.683
	Δ # Working adults$_t$	-0.112	-0.141	-0.107	-0.054
	# Working adults$_{t-1}$	1.024	1.021	0.921	0.950
	Δ #Kids$_t$	-0.086	-0.074	-0.052	-0.072
	#Kids$_{t-1}$	0.364	0.356	0.358	0.376
	Partner$^*_{t-1}$	0.811	0.785	0.761	0.778
	Reference person characteristics				
	Male$^*_{t-1}$	0.681	0.618	0.618	0.683
Age groups$_{t-1}$	25-34*	0.021	0.023	0.020	0.019
	35-44*	0.137	0.132	0.136	0.127
	45-54*	0.201	0.226	0.204	0.201
	55-64*	0.230	0.228	0.211	0.229
	65-74*	0.283	0.238	0.242	0.262
	$\geq$75*	0.128	0.153	0.187	0.162
Labor market$_{t-1}$	Employed*	0.428	0.426	0.410	0.450
	Unemployed*	0.024	0.045	0.069	0.080
	Retired*	0.394	0.362	0.408	0.377
	Inactive*	0.154	0.166	0.113	0.092
	Good health$^*_{t-1}$	0.727	0.725	0.711	0.734
	Δ Good health$^*_t$	-0.036	-0.050	-0.010	-0.077
Education$_{t-1}$	Terciary*	0.270	0.281	0.309	0.382
	Secondary*	0.223	0.234	0.238	0.244
	Primary or lower*	0.507	0.485	0.453	0.374
	Observations	1,136	1,653	954	1,008

		2002-2008	2005-2011	2008-2014	2011-2017
	High Skills$^*_{t-1}$	0.320	0.257	0.288	0.398
	Become retired$^*_t$	0.062	0.088	0.075	0.070
Job contract$_{t-1}$	No contract*	0.572	0.574	0.590	0.550
	Permanent contract*	0.273	0.287	0.274	0.267
	Fixed-term contract*	0.046	0.042	0.027	0.042
	Self-employed worker*	0.109	0.097	0.109	0.142
Job sector$_{t-1}$	No sector*	0.572	0.574	0.590	0.550
	Agriculture*	0.023	0.026	0.017	0.031
	Industry*	0.063	0.051	0.035	0.057
	Construction*	0.037	0.041	0.024	0.029
	Service*	0.305	0.309	0.334	0.333
	Other controls				
	# Years in the main residence$_t$	25.8	26.7	26.2	26.3
Level of income$_t$	Normal*	0.648	0.562	0.587	0.611
	Higher than usual*	0.062	0.080	0.075	0.080
	Lower than usual*	0.290	0.358	0.338	0.309
Level of income$_{t-1}$	Normal*	0.669	0.626	0.539	0.558
	Higher than usual*	0.075	0.079	0.081	0.077
	Lower than usual*	0.256	0.295	0.380	0.366
	Risk$^*_t$	0.208	0.182	0.193	0.250
	Risk$^*_{t-1}$	0.264	0.217	0.196	0.233
	Constraints$^*_t$	0.052	0.090	0.108	0.083
	Constraints$^*_{t-1}$	0.052	0.062	0.093	0.118
Income expectations$_t$	The same*	0.692	0.622	0.692	0.613
	Higher*	0.139	0.123	0.150	0.196
	Lower*	0.169	0.254	0.157	0.191
Income expectations$_{t-1}$	The same*	0.622	0.678	0.591	0.648
	Higher*	0.254	0.160	0.152	0.183
	Lower*	0.124	0.162	0.256	0.169
	Durables$^*_t$	0.506	0.519	0.462	0.565
	Durables$^*_{t-1}$	0.592	0.532	0.495	0.487
	Observations	1,136	1,653	954	1,008

Source: Spanish Survey of Households Finance (*Encuesta Financiera de las Familias*).

Notes: Monetary variables expressed in 2011 euros. * denotes categorical variables and their descriptive statistics represent shares. $\Delta \frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta \frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta \frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year.

Table A.3: Correlation debt vs changes in wealth

	Panel A: 2002-2008			**Panel B: 2005-2011**		
	[1]	[2]	[3]	[1]	[2]	[3]
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.322	–0.695	1.137	–0.508	–0.878	–0.777
	(0.847)	(0.842)	(1.003)	(0.596)	(0.567)	(0.695)
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–1.728	–1.307	–2.692	–0.634	–0.216	–0.258
	(0.925)*	(0.959)	(1.018)***	(0.564)	(0.569)	(0.577)
Constant	1.769	–3.419	–2.300	–1.546	–2.930	–4.857
	(0.814)**	(1.972)*	(6.569)	(0.679)**	(1.517)*	(5.755)
Observations	1136	1136	1136	1653	1653	1653
	Panel C: 2008-2011			**Panel D: 2011-2017**		
	[1]	[2]	[3]	[1]	[2]	[3]
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.082	–0.734	–0.806	–0.083	–0.481	–0.904
	(0.693)	(0.703)	(0.827)	(0.441)	(0.466)	(0.614)
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–1.226	–0.622	–0.864	–0.986	–0.542	–0.262
	(0.831)	(0.813)	(0.799)	(0.753)	(0.666)	(0.659)
Constant	–0.722	–5.323	–3.948	0.028	1.845	13.190
	(0.820)	(2.185)**	(5.918)	(1.314)	(2.447)	(7.846)*
Observations	954	954	954	1008	1008	1008
Wealth FE	No	Yes	Yes	No	Yes	Yes
Income FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

Notes: The dependent variable is the change in the ratio of net total wealth to non-asset income. $\Delta\frac{W_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls.

Table A.4: Characteristics by risk profile

	2002-2008		2005-2011		2008-2014		2011-2017	
	Risk=0	Risk=1	Risk=0	Risk=1	Risk=0	Risk=1	Risk=0	Risk=1
Non-durable consumption$_{t-1}$	14,539	21,505	15,441	21,058	14,695	24,876	15,976	26,554
Net total wealth$_{t-1}$	508,199	1,108,646	579,066	1,206,549	554,332	1,235,820	620,586	1,451,764
Total debt$_{t-1}$	17,779	43,246	24,707	41,016	28,609	60,342	34,692	48,078
Financial assets debt$_{t-1}$	4,263	16,659	5,002	8,700	4,597	10,982	4,689	9,211
Real assets debt$_{t-1}$	13,516	26,587	19,705	32,317	24,012	49,361	30,004	38,866
$\frac{Debt_{t-1}}{Y_{t-1}}$	0.495	0.857	0.659	0.834	0.898	1.084	1.127	1.097
$\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$	0.138	0.204	0.116	0.162	0.157	0.127	0.107	0.201
$\frac{Debt^{real}_{t-1}}{Y_{t-1}}$	0.320	0.567	0.509	0.596	0.710	0.891	0.989	0.843
Constraints$_{t-1}$	0.038	0.010	0.029	0.021	0.068	0.027	0.065	0.052
Wealth composition (shares at $t-1$)								
Housing	0.692	0.513	0.686	0.489	0.631	0.464	0.597	0.368
Other properties	0.210	0.292	0.211	0.333	0.227	0.318	0.249	0.354
Equities	0.014	0.058	0.011	0.044	0.020	0.075	0.027	0.089
Bonds	0.002	0.005	0.003	0.006	0.002	0.004	0.002	0.004
Mutual funds	0.013	0.040	0.007	0.023	0.009	0.030	0.012	0.055
Pension funds	0.014	0.034	0.017	0.029	0.020	0.035	0.025	0.049
Saving accounts	0.022	0.024	0.034	0.046	0.043	0.033	0.043	0.043
Deposits	0.030	0.030	0.029	0.025	0.038	0.033	0.037	0.030
Other	0.001	0.004	0.003	0.005	0.009	0.008	0.008	0.009
Observations	837	299	1294	359	767	187	773	235

Notes: Households' wealth composition is divided in 9 components due to the structure of the survey. We first calculate wealth shares at the household level and then we compute the group specific averages. In this way, we focus on differences in households' wealth composition regardless differences in the level of wealth. $\frac{Debt_{t-1}}{Y_{t-1}}$, $\frac{Debt^{fin}_{t-1}}{Y_{t-1}}$, and $\frac{Debt^{real}_{t-1}}{Y_{t-1}}$ are winsorized at the 1st and 99th percentiles within each imputation and year.

Table A.5: Debt characteristics: 2002-2008

	[1] Z = Loans	[2] $Z = r$	[3] Z = Fixed r	[4] Z =# Years	[5] Z = % Mort. rem.	[6] Z = % Fixed r	[7] Z = Spec1	[8] Z = Spec2
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	0.004	–0.001	–0.001	0.008	0.013	0.000	–0.006	–0.006
	(0.016)	(0.017)	(0.015)	(0.016)	(0.015)	(0.015)	(0.017)	(0.017)
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–0.016	–0.011	–0.010	–0.016	–0.019	–0.010	–0.013	–0.013
	(0.015)	(0.016)	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)
$\frac{Debt_{t-1}}{Y_{t-1}} * Z_{t-1}$	–0.012	–0.003	–0.078	–0.002	–0.054	–0.027	0.016	0.016
	(0.033)	(0.009)	(0.052)	(0.001)*	(0.039)	(0.033)	(0.021)	(0.021)
Constant	–0.161	–0.173	–0.171	–0.172	–0.168	–0.167	–0.156	–0.155
	(0.111)	(0.110)	(0.110)	(0.114)	(0.113)	(0.111)	(0.111)	(0.111)
Observations	1136	1136	1136	1136	1136	1136	1136	1136
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. Loans takes value 1 if the household has at least 1 outstanding loan related to the acquisition of the main residence. r is the annual interest rate on the main outstanding loan related to the acquisition of the main residence. Fixed r takes value 1 if the main outstanding loan related to the acquisition of the main residence has a fixed interest rate. # Years indicates the years to maturity of the credits related to the acquisition of the main residence (weighted by the value of the loan). % Mort. rem. is the amount pending repayment of loans related to the acquisition of the main residence (as a share of the initial amount of the loan). % Fixed r is the amount pending repayment of loans with a fixed rate (as a share of the total debt). Spec1 indicates if the household has acquired other real estate properties between $t-2$ and $t-1$ or owns more than 3 other real estate properties. Spec2 further takes value 1 if Spec1 is equal to 1 and if the household sold at least one real estate property in the year before $t-1$.

Table A.6: Debt characteristics: 2005-2011

	[1] Z = Loans	[2] $Z = r$	[3] Z = Fixed r	[4] Z =# Years	[5] Z = % Mort. rem.	[6] Z = % Fixed r	[7] Z = Spec1	[8] Z = Spec2
$\Delta\frac{W_t}{Y_t}$	0.006	0.006	0.006	0.007	0.007	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.036	–0.034	–0.027	–0.030	–0.031	–0.023	–0.034	–0.033
	(0.013)***	(0.013)***	(0.009)***	(0.013)**	(0.013)**	(0.010)**	(0.012)***	(0.012)***
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–0.002	–0.002	–0.003	–0.001	–0.001	–0.003	–0.003	–0.003
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
$\frac{Debt_{t-1}}{Y_{t-1}} * Z_{t-1}$	0.013	0.002	0.002	–0.001	–0.013	–0.033	0.014	0.014
	(0.016)	(0.003)	(0.044)	(0.001)	(0.020)	(0.022)	(0.017)	(0.017)
Constant	0.146	0.158	0.174	0.138	0.139	0.182	0.182	0.181
	(0.095)	(0.094)*	(0.094)*	(0.095)	(0.095)	(0.095)*	(0.094)*	(0.094)*
Observations	1653	1653	1653	1653	1653	1653	1653	1653
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. Loans takes value 1 if the household has at least 1 outstanding loan related to the acquisition of the main residence. r is the annual interest rate on the main outstanding loan related to the acquisition of the main residence. Fixed r takes value 1 if the main outstanding loan related to the acquisition of the main residence has a fixed interest rate. # Years indicates the years to maturity of the credits related to the acquisition of the main residence (weighted by the value of the loan). % Mort. rem. is the amount pending repayment of loans related to the acquisition of the main residence (as a share of the initial amount of the loan). % Fixed r is the amount pending repayment of loans with a fixed rate (as a share of the total debt). Spec1 indicates if the household has acquired other real estate properties between $t-2$ and $t-1$ or owns more than 3 other real estate properties. Spec2 further takes value 1 if Spec1 is equal to 1 and if the household sold at least one real estate property in the year before $t-1$.

Table A.7: Debt characteristics: 2008-2014

	[1] Z = Loans	[2] $Z = r$	[3] Z = Fixed r	[4] Z =# Years	[5] Z = % Mort. rem.	[6] Z = % Fixed r	[7] Z = Spec1	[8] Z = Spec2
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.043	–0.044	–0.028	–0.047	–0.044	–0.027	–0.029	–0.026
	(0.014)***	(0.013)***	(0.012)**	(0.013)***	(0.014)***	(0.012)**	(0.012)**	(0.012)**
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–0.004	–0.003	–0.006	–0.002	–0.004	–0.006	–0.006	–0.005
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
$\frac{Debt_{t-1}}{Y_{t-1}} * Z_{t-1}$	0.024	0.008	–0.024	0.001	0.029	–0.028	–0.006	–0.012
	(0.017)	(0.004)*	(0.015)	(0.001)*	(0.021)	(0.016)*	(0.016)	(0.016)
Constant	0.210	0.213	0.273	0.183	0.194	0.270	0.259	0.254
	(0.099)**	(0.099)**	(0.101)***	(0.097)*	(0.099)*	(0.102)***	(0.101)**	(0.102)**
Observations	954	954	954	954	954	954	954	954
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

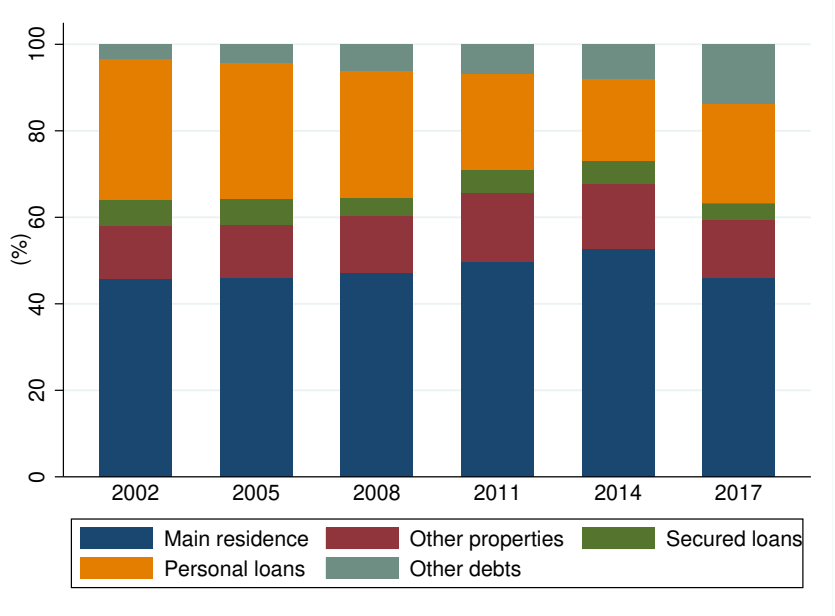
Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. Loans takes value 1 if the household has at least 1 outstanding loan related to the acquisition of the main residence. r is the annual interest rate on the main outstanding loan related to the acquisition of the main residence. Fixed r takes value 1 if the main outstanding loan related to the acquisition of the main residence has a fixed interest rate. # Years indicates the years to maturity of the credits related to the acquisition of the main residence (weighted by the value of the loan). % Mort. rem. is the amount pending repayment of loans related to the acquisition of the main residence (as a share of the initial amount of the loan). % Fixed r is the amount pending repayment of loans with a fixed rate (as a share of the total debt). Spec1 indicates if the household has acquired other real estate properties between $t-2$ and $t-1$ or owns more than 3 other real estate properties. Spec2 further takes value 1 if Spec1 is equal to 1 and if the household sold at least one real estate property in the year before $t-1$.

Table A.8: Debt characteristics: 2011-2017

	[1] Z = Loans	[2] $Z = r$	[3] Z = Fixed r	[4] Z =# Years	[5] Z = % Mort. rem.	[6] Z = % Fixed r	[7] Z = Spec1	[8] Z = Spec2
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.010	–0.012	–0.014	–0.007	–0.011	–0.011	–0.011	–0.011
	(0.010)	(0.008)	(0.006)**	(0.008)	(0.009)	(0.006)*	(0.007)*	(0.007)*
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$	–0.006	–0.006	–0.005	–0.006	–0.005	–0.005	–0.005	–0.005
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
$\frac{Debt_{t-1}}{Y_{t-1}} * Z_{t-1}$	–0.000	0.002	0.019	–0.000	–0.002	–0.008	–0.001	–0.001
	(0.012)	(0.003)	(0.017)	(0.000)	(0.015)	(0.025)	(0.013)	(0.013)
Constant	0.170	0.166	0.166	0.187	0.160	0.154	0.149	0.151
	(0.115)	(0.110)	(0.110)	(0.114)	(0.115)	(0.110)	(0.112)	(0.112)
Observations	1008	1008	1008	1008	1008	1008	1008	1008
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

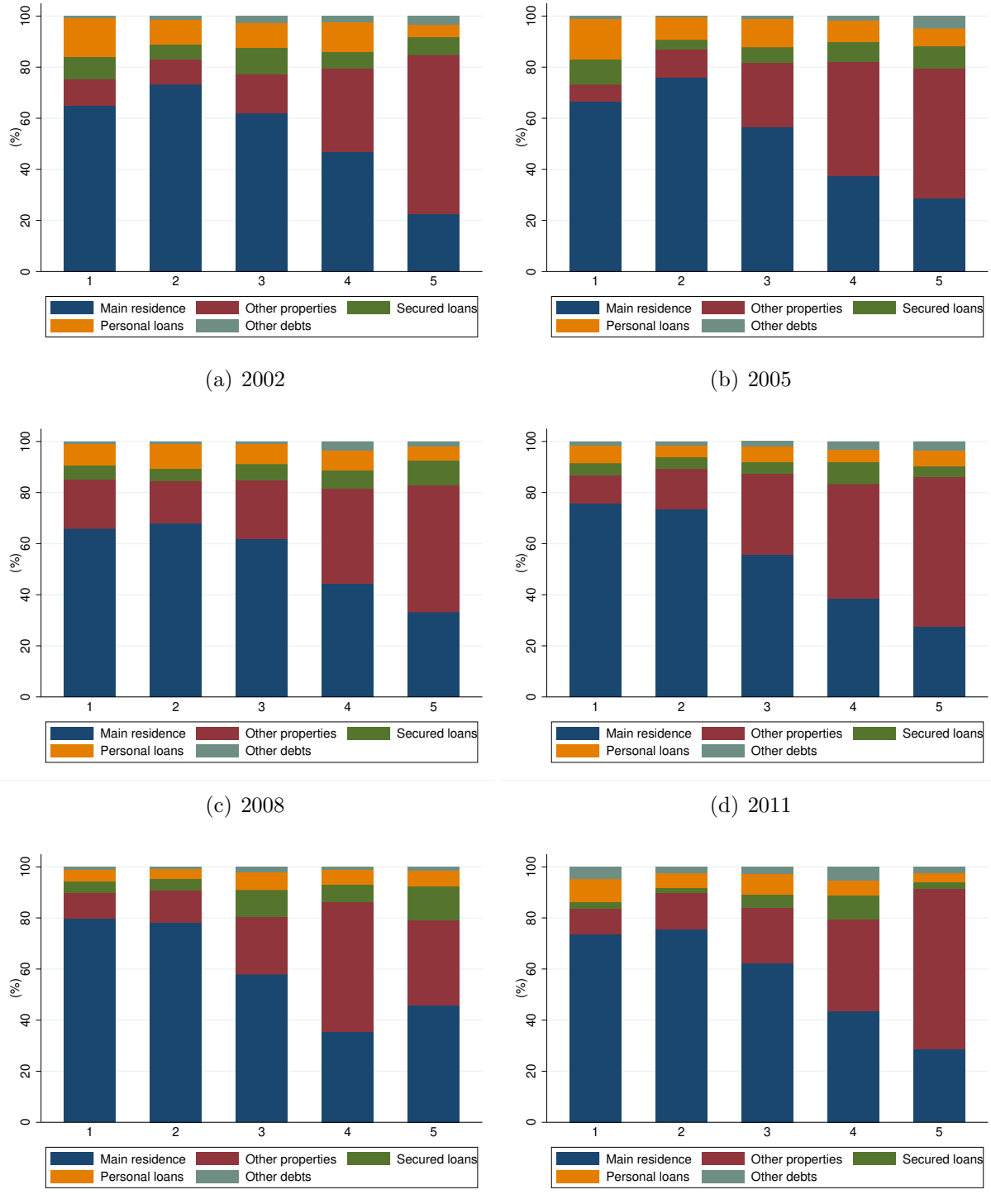
Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. Loans takes value 1 if the household has at least 1 outstanding loan related to the acquisition of the main residence. r is the annual interest rate on the main outstanding loan related to the acquisition of the main residence. Fixed r takes value 1 if the main outstanding loan related to the acquisition of the main residence has a fixed interest rate. # Years indicates the years to maturity of the credits related to the acquisition of the main residence (weighted by the value of the loan). % Mort. rem. is the amount pending repayment of loans related to the acquisition of the main residence (as a share of the initial amount of the loan). % Fixed r is the amount pending repayment of loans with a fixed rate (as a share of the total debt). Spec1 indicates if the household has acquired other real estate properties between $t-2$ and $t-1$ or owns more than 3 other real estate properties. Spec2 further takes value 1 if Spec1 is equal to 1 and if the household sold at least one real estate property in the year before $t-1$.

Figure A.1: Debt composition: Weighted average of households' shares



Notes: The debt composition is obtained as the weighted average of household-specific debt shares. Cross-sectional weights are provided by the Bank of Spain following the 2011 Census so as to provide representative statistics at the national level. To calculate the debt composition we include only households with outstanding debts."Main residence" accounts for outstanding debts from loans used to purchase the main residence, "Other properties" represents loans used to purchase other real estate properties different from the main residence, "Secured loans" are outstanding debts from mortgages and other secured loans not related to the purchase of real estate assets, "Personal loans" indicates outstanding debts from personal loans, and "Other debts" covers all other debts that do not fit into the above classifications such as credit card debts, deferred payments, or loans from friends or family.
Source: Encuesta Financiera de las Familias, EFF.

Figure A.2: Debt composition by quintile



(a) 2002

(b) 2005

(c) 2008

(d) 2011

(e) 2014

(f) 2017

Notes: Debt shares are obtained after computing the weighted average of the different debt components. Cross-sectional weights are provided by the Bank of Spain following the 2011 Census so as to provide representative statistics at the national level. Households are divided into 5 quintiles based on their net wealth. "Main residence" accounts for outstanding debts from loans used to purchase the main residence, "Other properties" represents loans used to purchase other real estate properties different from the main residence, "Secured loans" are outstanding debts from mortgages and other secured loans not related to the purchase of real estate assets, "Personal loans" indicates outstanding debts from personal loans, and "Other debts" covers all other debts that do not fit into the above classifications such as credit card debts, deferred payments, or loans from friends or family.
Source: Encuesta Financiera de las Familias, EFF.

APPENDIX B: Robustness

Table B.1: Baseline results: Including non-homeowners

	Panel A: 2002-2008					**Panel B: 2005-2011**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.013	–0.016	–0.015		–0.002	–0.016	–0.021	–0.025		–0.023
	(0.010)	(0.010)	(0.010)		(0.013)	(0.007)**	(0.007)***	(0.007)***		(0.008)***
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$				–0.019	–0.018				–0.014	–0.005
				(0.011)*	(0.014)				(0.007)**	(0.008)
Constant	–0.010	–0.202	–0.174	–0.179	–0.178	0.017	–0.077	0.088	0.057	0.083
	(0.011)	(0.052)***	(0.117)	(0.118)	(0.118)	(0.009)*	(0.033)**	(0.080)	(0.079)	(0.080)
Observations	1361	1361	1361	1361	1361	1963	1963	1963	1963	1963
	Panel C: 2008-2014					**Panel D: 2011-2017**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.004	0.005	0.004	0.006	0.006	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{Y_{t-1}}$	–0.015	–0.022	–0.027		–0.023	–0.009	–0.011	–0.009		–0.007
	(0.008)*	(0.008)***	(0.009)***		(0.011)**	(0.005)**	(0.005)**	(0.006)		(0.006)
$\Delta\frac{Debt_{t-1}}{Y_{t-1}}$				–0.020	–0.009				–0.009	–0.006
				(0.009)**	(0.011)				(0.007)	(0.007)
Constant	0.035	–0.047	0.141	0.083	0.135	–0.047	–0.047	0.134	0.111	0.131
	(0.011)***	(0.045)	(0.106)	(0.106)	(0.106)	(0.011)***	(0.037)	(0.095)	(0.094)	(0.095)
Observations	1105	1105	1105	1105	1105	1204	1204	1204	1204	1204
Wealth FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Income FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls.

Table B.2: Non-linearities: Including non-homeowners

	Panel A: 2002-2008						Panel B: 2005-2011					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
DEBT_{t-1}	–0.052	0.004					–0.017	–0.017				
	(0.025)**	(0.036)					(0.019)	(0.030)				
HDI^{50}_{t-1}			–0.075	–0.049					–0.040	–0.032		
			(0.032)**	(0.034)					(0.023)*	(0.025)		
HDI^{75}_{t-1}					–0.089	–0.062					–0.093	–0.085
					(0.043)**	(0.044)					(0.031)***	(0.032)***
$\frac{DEBT_{t-1}}{Y_{t-1}} < 0$		–0.033		–0.022		–0.029		0.039		0.036		0.035
		(0.030)		(0.025)		(0.025)		(0.028)		(0.021)*		(0.021)*
$\frac{DEBT_{t-1}}{Y_{t-1}} > 0$		–0.082		–0.054		–0.061		–0.013		–0.012		–0.003
		(0.044)*		(0.032)*		(0.030)**		(0.035)		(0.026)		(0.024)
Constant	–0.179	–0.178	–0.166	–0.170	–0.181	–0.178	0.064	0.059	0.070	0.065	0.080	0.073
	(0.118)	(0.118)	(0.118)	(0.118)	(0.117)	(0.118)	(0.079)	(0.079)	(0.079)	(0.079)	(0.080)	(0.079)
Observations	1361	1361	1361	1361	1361	1361	1963	1963	1963	1963	1963	1963
	Panel C: 2008-2014						**Panel D: 2011-2017**					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
DEBT_{t-1}	–0.031	–0.015					–0.032	0.008				
	(0.026)	(0.037)					(0.024)	(0.034)				
HDI^{50}_{t-1}			–0.090	–0.090					–0.056	–0.036		
			(0.034)***	(0.033)***					(0.027)**	(0.030)		
HDI^{75}_{t-1}					–0.100	–0.095					–0.023	0.001
					(0.046)**	(0.047)**					(0.035)	(0.037)
$\frac{DEBT_{t-1}}{Y_{t-1}} < 0$		–0.002		0.003		–0.006		–0.018		–0.007		–0.013
		(0.035)		(0.026)		(0.026)		(0.030)		(0.025)		(0.025)
$\frac{DEBT_{t-1}}{Y_{t-1}} > 0$		–0.031		0.000		–0.012		–0.070		–0.047		–0.063
		(0.046)		(0.032)		(0.031)		(0.042)*		(0.032)		(0.030)**
Constant	0.081	0.080	0.102	0.101	0.111	0.112	0.120	0.130	0.119	0.130	0.117	0.129
	(0.107)	(0.108)	(0.106)	(0.106)	(0.106)	(0.107)	(0.095)	(0.095)	(0.094)	(0.095)	(0.096)	(0.096)
Observations	1105	1105	1105	1105	1105	1105	1204	1204	1204	1204	1204	1204
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. $DEBT_{t-1}$ is a dummy that takes value 1 if the household has any outstanding debt. HDI^{50}_{t-1} is a dummy accounting for households with a debt to non-financial income ratio above the median of households having any debt. HDI^{75}_{t-1} is a dummy accounting for the top quartile within the distribution of households having an outstanding debt. $\frac{DEBT_{t-1}}{Y_{t-1}} < 0$ and $\frac{DEBT_{t-1}}{Y_{t-1}} > 0$ indicate if households' debt has decreased or increased between period $t-2$ and $t-1$.

Table B.3: Baseline results: Debt service

	Panel A: 2002-2008					Panel B: 2005-2011				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.006	0.006	0.007	0.007	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$	–0.128	–0.144	–0.182		–0.052	–0.136	–0.186	–0.250		–0.225
	(0.089)	(0.089)	(0.093)*		(0.103)	(0.065)**	(0.067)***	(0.075)***		(0.076)***
$\Delta\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$				–0.233	–0.204				–0.144	–0.053
				(0.084)***	(0.091)**				(0.065)**	(0.065)
Constant	0.004	–0.094	–0.137	–0.177	–0.169	0.020	–0.048	0.177	0.105	0.171
	(0.012)	(0.044)**	(0.109)	(0.107)	(0.109)	(0.010)*	(0.034)	(0.093)*	(0.093)	(0.093)*
Observations	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653
	Panel C: 2008-2014					**Panel D: 2011-2017**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.006	0.005	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$	–0.282	–0.318	–0.343		–0.373	–0.171	–0.181	–0.203		–0.197
	(0.076)***	(0.075)***	(0.087)***		(0.093)***	(0.063)***	(0.062)***	(0.071)***		(0.072)***
$\Delta\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$				–0.114	0.062				–0.079	–0.018
				(0.094)	(0.093)				(0.068)	(0.069)
Constant	0.051	–0.029	0.216	0.121	0.227	–0.041	–0.085	0.166	0.081	0.164
	(0.012)***	(0.050)	(0.094)**	(0.094)	(0.095)**	(0.012)***	(0.050)*	(0.105)	(0.101)	(0.105)
Observations	954	954	954	954	954	1008	1008	1008	1008	1008
Wealth FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Income FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$, $\Delta\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. $\frac{Debt_{t-1}^{Serv}}{Y_{t-1}}$ represents the debt service to non-asset income ratio. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls.

Table B.4: Non-linearities: Debt service

	Panel A: 2002-2008						Panel B: 2005-2011					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.007	0.006	0.007	0.007	0.007	0.006	0.007	0.007	0.007	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
DEBT^{Serv}_{t-1}	–0.053	0.049					–0.012	–0.012				
	(0.026)**	(0.037)					(0.021)	(0.033)				
HDSI^{50}_{t-1}			–0.084	–0.037					–0.059	–0.059		
			(0.033)**	(0.035)					(0.025)**	(0.027)**		
HDSI^{75}_{t-1}					–0.091	–0.042					–0.151	–0.159
					(0.046)*	(0.048)					(0.036)***	(0.037)***
$\frac{DEBT^{Serv}_{t-1}}{Y_{t-1}} < 0$		–0.029		0.003		0.001		0.042		0.044		0.046
		(0.032)		(0.026)		(0.027)		(0.030)		(0.024)*		(0.023)**
$\frac{DEBT^{Serv}_{t-1}}{Y_{t-1}} > 0$		–0.148		–0.084		–0.090		–0.008		0.013		0.031
		(0.045)***		(0.032)**		(0.031)***		(0.039)		(0.027)		(0.025)
Constant	–0.141	–0.145	–0.139	–0.140	–0.159	–0.146	0.110	0.101	0.145	0.129	0.170	0.152
	(0.109)	(0.108)	(0.108)	(0.108)	(0.109)	(0.108)	(0.093)	(0.093)	(0.093)	(0.094)	(0.093)*	(0.093)
Observations	1136	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653	1653
	Panel C: 2008-2014						**Panel D: 2011-2017**					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.007	0.006	0.007	0.007	0.007	0.006	0.007	0.007	0.007	0.006	0.006	0.006
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
DEBT^{Serv}_{t-1}	–0.053	0.050					–0.012	–0.012				
	(0.026)**	(0.037)					(0.021)	(0.033)				
HDSI^{50}_{t-1}			–0.084	–0.036					–0.059	–0.059		
			(0.033)**	(0.035)					(0.025)**	(0.027)**		
HDSI^{75}_{t-1}					–0.090	–0.040					–0.152	–0.159
					(0.046)*	(0.048)					(0.036)***	(0.037)***
$\frac{DEBT^{Serv}_{t-1}}{Y_{t-1}} < 0$		–0.029		0.004		0.001		0.043		0.045		0.047
		(0.032)		(0.026)		(0.027)		(0.030)		(0.024)*		(0.023)**
$\frac{DEBT^{Serv}_{t-1}}{Y_{t-1}} > 0$		–0.150		–0.085		–0.091		–0.008		0.014		0.031
		(0.045)***		(0.032)***		(0.031)***		(0.039)		(0.027)		(0.025)
Constant	–0.142	–0.147	–0.141	–0.141	–0.160	–0.148	0.110	0.101	0.145	0.129	0.170	0.152
	(0.109)	(0.108)	(0.108)	(0.108)	(0.109)	(0.108)	(0.093)	(0.093)	(0.094)	(0.094)	(0.093)*	(0.094)
Observations	954	954	954	954	954	954	1008	1008	1008	1008	1008	1008
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. $DEBT^{Serv}_{t-1}$ is a dummy that takes value 1 if the household has a positive debt service. $HDSI^{50}_{t-1}$ is a dummy accounting for households with a debt service to non-financial income ratio above the median of households having any debt. $HDSI^{75}_{t-1}$ is a dummy accounting for the top quartile within the distribution of households having any debt service. $\frac{DEBT^{Serv}_{t-1}}{Y_{t-1}} < 0$ and $\frac{DEBT^{Serv}_{t-1}}{Y_{t-1}} > 0$ indicate if households' debt service has decreased or increased between period $t-2$ and $t-1$.

Table B.5: Baseline results: LTV

	Panel A: 2002-2008					Panel B: 2005-2011				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{A_{t-1}}$	0.051	0.018	0.004		0.028	–0.021	–0.080	–0.103		–0.122
	(0.058)	(0.063)	(0.067)		(0.074)	(0.051)	(0.058)	(0.062)*		(0.065)*
$\Delta\frac{Debt_{t-1}}{A_{t-1}}$				–0.037	–0.050				0.034	0.059
				(0.062)	(0.067)				(0.048)	(0.051)
Constant	–0.013	–0.105	–0.161	–0.167	–0.176	0.008	–0.056	0.140	0.107	0.153
	(0.012)	(0.044)**	(0.110)	(0.110)	(0.115)	(0.010)	(0.034)*	(0.096)	(0.092)	(0.096)
Observations	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653
	Panel C: 2008-2014					**Panel D: 2011-2017**				
	[1]	[2]	[3]	[4]	[5]	[1]	[2]	[3]	[4]	[5]
$\Delta\frac{W_t}{Y_t}$	0.006	0.005	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
$\frac{Debt_{t-1}}{A_{t-1}}$	–0.022	–0.084	–0.081		–0.103	–0.010	–0.023	–0.016		–0.034
	(0.033)	(0.039)**	(0.045)*		(0.058)*	(0.025)	(0.030)	(0.035)		(0.039)
$\Delta\frac{Debt_{t-1}}{A_{t-1}}$				–0.030	0.043				0.034	0.053
				(0.053)	(0.069)				(0.043)	(0.048)
Constant	0.025	–0.048	0.185	0.131	0.196	–0.059	–0.116	0.095	0.079	0.106
	(0.012)**	(0.050)	(0.100)*	(0.094)	(0.102)*	(0.012)***	(0.056)**	(0.108)	(0.102)	(0.108)
Observations	954	954	954	954	954	1008	1008	1008	1008	1008
Wealth FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Income FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. $\Delta\frac{C_t}{Y_t}$, $\frac{Debt_{t-1}}{A_{t-1}}$, $\Delta\frac{Debt_{t-1}}{A_{t-1}}$, and $\Delta\frac{W_t}{Y_t}$ are winsorized at the 1st and 99th percentiles within each imputation and year. $\frac{Debt_{t-1}}{A_{t-1}}$ represents the loan to value ratio defined as the ratio of total debt to the value of the main residence. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls.

Table B.6: Non-linearities: LTV

	Panel A: 2002-2008						Panel B: 2005-2011					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
LTV_{t-1}	–0.053	–0.020					–0.015	–0.055				
	(0.026)**	(0.037)					(0.021)	(0.032)*				
HLTV^{50}_{t-1}			–0.024	0.000					–0.034	–0.045		
			(0.031)	(0.032)					(0.026)	(0.028)		
HLTV^{75}_{t-1}					–0.071	–0.055					–0.062	–0.071
					(0.038)*	(0.038)					(0.032)*	(0.033)**
$\frac{LTV_{t-1}}{Y_{t-1}} < 0$		–0.033		–0.045		–0.042		0.047		0.024		0.019
		(0.032)		(0.029)		(0.028)		(0.030)		(0.023)		(0.023)
$\frac{LTV_{t-1}}{Y_{t-1}} > 0$		–0.051		–0.070		–0.056		0.061		0.031		0.028
		(0.045)		(0.034)**		(0.033)*		(0.040)		(0.028)		(0.027)
Constant	–0.142	–0.141	–0.148	–0.143	–0.146	–0.131	0.111	0.103	0.130	0.125	0.139	0.132
	(0.109)	(0.110)	(0.110)	(0.111)	(0.108)	(0.109)	(0.093)	(0.093)	(0.096)	(0.097)	(0.094)	(0.094)
Observations	1136	1136	1136	1136	1136	1136	1653	1653	1653	1653	1653	1653
	Panel C: 2008-2014						**Panel D: 2011-2017**					
	[1]	[2]	[3]	[4]	[5]	[6]	[1]	[2]	[3]	[4]	[5]	[6]
$\Delta\frac{W_t}{Y_t}$	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
LTV_{t-1}	–0.029	–0.006					–0.032	–0.010				
	(0.028)	(0.041)					(0.027)	(0.038)				
HLTV^{50}_{t-1}			–0.053	–0.046					–0.027	–0.019		
			(0.031)*	(0.035)					(0.030)	(0.033)		
HLTV^{75}_{t-1}					–0.045	–0.036					–0.001	–0.001
					(0.037)	(0.040)					(0.040)	(0.044)
$\frac{LTV_{t-1}}{Y_{t-1}} < 0$		–0.020		–0.020		–0.024		–0.038		–0.042		–0.044
		(0.037)		(0.030)		(0.030)		(0.032)		(0.028)		(0.027)
$\frac{LTV_{t-1}}{Y_{t-1}} > 0$		–0.036		–0.022		–0.033		–0.027		–0.028		–0.035
		(0.048)		(0.036)		(0.034)		(0.045)		(0.036)		(0.034)
Constant	0.145	0.149	0.176	0.181	0.158	0.168	0.107	0.114	0.102	0.122	0.082	0.112
	(0.095)	(0.095)	(0.097)*	(0.097)*	(0.097)	(0.097)*	(0.105)	(0.106)	(0.105)	(0.107)	(0.105)	(0.108)
Observations	954	954	954	954	954	954	1008	1008	1008	1008	1008	1008
Wealth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in the ratio of non-durable consumption to non-asset income. Standard errors in parentheses account for multiple imputations and complex survey design. * significant at 10%; ** significant at 5%; *** significant at 1%. Table A.2 in Appendix A displays the complete list of controls. LTV_{t-1} is a dummy that takes value 1 if the household has any outstanding debt. $HLTV^{50}_{t-1}$ is a dummy accounting for households with a loan to value ratio above the median of households having any debt. $HLTV^{75}_{t-1}$ is a dummy accounting for households in the loan to value top quartile conditional on having any debt. $\frac{LTV_{t-1}}{Y_{t-1}} < 0$ and $\frac{LTV_{t-1}}{Y_{t-1}} > 0$ indicate if households' loan to value has decreased or increased between period $t-2$ and $t-1$.