

Beyond Consumption: Exploring Productive Borrowing in Household Finance

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Abstract

In the aftermath of the 2008 financial crisis, the conventional view of household debt in economic research has primarily associated it with consumption analyses at the macroeconomic level. This paper offers a novel perspective by disaggregating household borrowing into consumption and productive components at the micro-level. Using longitudinal data from the European Central Bank's Household Finance and Consumption Survey (HFCS), we examine how specific categories of household debt deemed productive—namely, real estate investments, education, business activities, and debt refinancing—affect household financial outcomes over time. Using a System Generalized Method of Moments (GMM) framework, our empirical analysis shows that a 10% increase in productive borrowing in the preceding period is associated with approximately a 0.33% rise in household income and a 9% increase in business wealth. In addition, the findings indicate that investments in additional real estate—such as rental income and property value appreciation—are the primary channels driving the income effects. This study highlights the importance of distinguishing between different debt types. Equating consumer loans with productive loans may underestimate households' wealth-generating capacities and diminish their active role within the economy.

Keywords: Household Production, Household Economics, Intertemporal

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1. Introduction

In the months following the 2008 global financial crisis, the role of private debt within the economy was completely reevaluated. While the lax provision of credit initially drove an expansion of the economy, the unsustainability of unchecked lending ultimately contributed to one of the most severe recessions in recent history. Ex-post studies have shown that rapid credit growth is a strong predictor of financial crises (Jordà et al., 2013; Schularick and Taylor, 2012; Jordà et al., 2014, 2015). Similarly, both Mian et al. (2015) and Lombardi et al. (2017) demonstrate that an increase in the household debt-to-GDP ratio tends to boost consumption and GDP in the short term, but has negative effects over the long term. More recently, Berisha and Meszaros (2018) find that rising household debt and income inequality tend to narrow yield spreads, which is another indicator of economic contraction.

In contrast, Gorton and Ordoñez (2016) theorize a “bad” and a “good” crisis: the former occurs when the productivity of leveraged investments declines, prompting stricter credit conditions and a faster economic downturn; the latter arises when improvements in investment quality counterbalance the drop in productivity, resulting in a reduction in credit but not in a crisis. This distinction underscores the importance of understanding the reasons for credit issuance. However, recent literature has largely treated household debt in aggregate, assuming that households borrow primarily to maintain high consumption levels. For example, Setterfield and Kim (2016) argue that households, not understanding the consequences of their behavior, borrow to emulate the consumption standards of wealthier families. Zabai (2017) suggests that a greater concentration of debt among poorer households can amplify consumption cuts at the macro level, and Fagereng and Halvorsen (2016) find that indebted households reduce consumption following sudden economic shocks. Similarly, Du Caju et al. (2023) show that households with a debt-service-to-income ratio greater than 30% cut back on consumption for precautionary reasons. On the other hand, Aladangady (2017) finds that credit-constrained households increase their consumption when more collateral, such as rising house prices, becomes available. In addition, Moore and Stockhammer (2018) identify real residential house prices as the most robust determinant of household debt. Finally, Baker (2018) suggests that

household debt has only a marginal effect on consumption when liquidity and access to credit are considered.

While these studies offer valuable insights into the effects of household debt on aggregate consumption, no research has yet broken down household debt by its purpose. According to [Gorton and Ordoñez \(2016\)](#)'s theory, this distinction is crucial, as credit used for productive investments does not necessarily lead to a financial crisis. Aggregating household debt assigns equal weight to credit used for productive investments and for consumption, thereby missing an important window into the financial behavior of households.

Moreover, the existing literature has not examined how these loans affect households' financial performance. In the aftermath of the 2008 financial crisis, attention has largely focused on macroeconomic trends, while neglecting, among other things, both the human and productive aspects of household finance. As reported by [Mason \(2018\)](#), the vast majority of US households do not borrow to sustain consumption, but to finance assets expected to generate future income or equivalent benefits. Failing to recognize the potential of this revenue-generating channel could lead to overlooking an important dynamic within the economy.

Using data from the European Central Bank's Household Finance and Consumption Survey (HFCS), we identify four categories of households' productive loans: (1) purchasing additional real estate, (2) education, (3) starting a new business, and (4) debt refinancing. Our hypothesis is that these types of loans enhance household income and wealth generated by a family's professional activity over the long term. To test this, we employ the System Generalized Method of Moments (GMM), which addresses the endogeneity inherent in the dynamics of these models.

The results support the initial hypothesis. Over time, productive investments lead to an increase in both household income and business wealth. Specifically, a 10% increase in productive loans at time $t - 1$ is associated with an approximate 0.33% rise in income in the following period t . Meanwhile, the same amount of debt invested in family business activities at time $t - 1$ corresponds to about a 9% increase in family business wealth in the next period. In addition, the decomposition of productive borrowing indicates that the most significant effect on income stems from loans used to purchase properties that are not primary residences, implying that the main increase occurs through the channel of rental income generation or land appreciation.

This study makes three contributions to the academic literature. First,

it provides the first empirical analysis that breaks down household debt into its distinct usage components. Unlike existing literature, this paper adopts a micro perspective on borrowing that uncovers wealth creation patterns that traditional analyses have overlooked. This idea emphasizes the need to move beyond viewing households solely as consumers of goods and instead recognize them as key strategic players in society. Households are not just focused on consumption, rather they are also actively engaged in generating new wealth, a process that can be achieved also through access to credit. In this respect, the paper contributes new empirical evidence to the field of household finance by using recent longitudinal data to study the within-household effects of productive loans across several European countries. This represents an innovative take on the management of family finances that no previous study has ever explored.

The remainder of the paper is structured as follows: Section 2 introduces the dataset and the main variables analyzed. Section 3 outlines the model specification, while Section 4 discusses the results obtained. Finally, Section 5 concludes the paper with a summary of the main contributions and suggestions for future research.

2. Data and Descriptive Statistics

2.1. Data Source

The dataset used for this analysis is the Household Finance and Consumption Survey (HFCS)¹, a series of interviews conducted roughly every three years that examine the consumption behaviors and financial management practices of European households. As shown in Table 1, four waves of interviews are available so far — the first of which began in 2009 and concluded in 2011 across 15 European countries. Over time, the number of participating countries has grown, and by 2022, the survey had reached approximately 330,000 households.

¹European Central Bank: Household Finance and Consumption Survey (HFCS).
https://www.ecb.europa.eu/stats/ecb_surveys/hfcs/html/index.en.html. Accessed 02 March 2025

Table 1: Overview of HFCS Survey Waves

Survey Wave	Survey Period	N. of Countries	Households Obs.
First Wave	2009-2011	15	68,627
Second Wave	2013-2015	20	84,611
Third Wave	2017-2018	22	91,242
Fourth Wave	2020-2022	22	83,162
Total			327,642

A subset of the overall sample appears in every interview, allowing us to construct a panel dataset that tracks changes in the variables reported by the same household over time. This sub-sample is shown in Table 2. The analysis in this paper is based on approximately 16,500 households across five euro-zone countries: Germany (1,216 households), Italy (1,129 households), Spain (809 households), Cyprus (623 households), and Belgium (335 households).

Table 2: Countries with Panel Component

Country	First Wave	Second Wave	Third Wave	Fourth Wave	Total
Belgium	335	335	335	335	1,340
Cyprus	623	623	623	623	2,492
Germany	1,216	1,216	1,216	1,216	4,864
Spain	809	809	809	809	3,236
Italy	1,129	1,129	1,129	1,129	4,516
Total	4,112	4,112	4,112	4,112	16,448

To account for minor discrepancies in data collection timing across countries, variables are adjusted for inflation using the Harmonised Index of Consumer Prices (HICP). Additionally, to reduce the impact of item non-response, the HFCS provides five imputed values for each missing entry based on observable variables, resulting in five complete datasets. The following subsection introduces the dependent variables of the analysis.

2.1.1. Dependent variables

Household income (*HH_Income*) is one of the two dependent variables of this study. The variable represents the household's annual gross income, equalized using the modified OECD equivalence scale to facilitate comparisons among families of different sizes and compositions. Specifically, total

gross annual household income (*Income*) is divided by the number of economically active household members (*Econ_Active*), that is, those who provide labor for the production of goods and services during a specified reference period². The resulting equation is the following:

$$HH_Income = \frac{Income}{Econ_Active}. \quad (1)$$

To address any skewness present in the data, all monetary variables are transformed using the Inverse Hyperbolic Sine (IHS) function. As suggested by [Pence \(2006\)](#), IHS transformations handle zero and negative values effectively, compressing high values while preserving the distribution's shape. This transformation is particularly useful in wealth research and has become standard practice in the literature ([Causa et al., 2019](#)).

To assess the impact of productive loans on household entrepreneurial activity over time, the second dependent variable in our analysis is *BusinessWealth*. This variable is defined as the sum of the following components:

- **Value of real estate property used for business activities**, calculated as the product of the household's ownership share and the current property value;
- **Net value of self-employment businesses**, determined by subtracting associated liabilities from the business assets;
- **Value of non self-employment private businesses**, representing the household's share in non-publicly traded enterprises.

These components reflect the household wealth accumulated through entrepreneurial ventures, enabling us to assess how the productive loans have contributed to its growth.

[Fig. 1](#) examines households' movements across business wealth quintiles. The transition matrix reveals considerable change in business wealth over time. Specifically, households in the lowest quintile in 2011 (Q1) exhibit notable upward mobility, with 25% transitioning to the 4th quintile and 8.3% reaching the 5th quintile. Similarly, households in the 2nd quintile see 24.3% moving up to Q4 and 5.4% entering the highest quintile. At

²International Labour Organization (ILO), <http://laborsta.ilo.org/applv8/data/c1e.html>.

the same time, downward mobility from the top quintile is less pronounced; for instance, households in the 5th quintile in 2011 largely maintain their position, with 67.8% remaining at the top and 25.4% moving down to Q4. These results indicate that while there is substantial overall upward mobility, wealth concentration at the top persists over the study period. The next section introduces the explanatory variables used to identify these movements: *ProductiveLoans*.

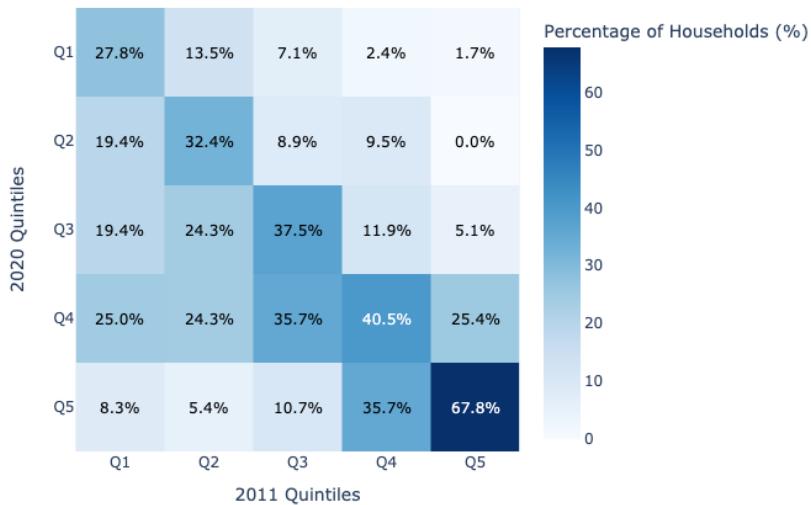


Fig. 1: Households' Business Wealth Quintile Transitions (2011-2020)

2.1.2. Productive loans

Productive loans are central to this paper's argument. Unlike consumption debt, productive loans have the potential to enhance a household's economic condition over time. The HFCS identifies four categories of debt that households may incur, each represented as a binary variable (1 = Yes, 0 = No):

1. Mortgages or loans using Household Main Residence (HMR) as collateral.

2. Mortgages or loans using other property as collateral.
3. Non-collateralized loans.
4. Private loans.

When a household opens one of these credit lines, the interviewer asks for both the primary and secondary purposes behind the debt. The HFCS lists nine possible motivations for taking out loans: (1) to purchase or construct the HMR, (2) to purchase other real estate, (3) to refurbish or renovate the residence, (4) to buy a vehicle or other means of transport, (5) to finance a business or professional activity, (6) to consolidate or refinance debts, (7) for education purposes, (8) to cover living expenses or other purchases, and (9) other. To construct the *ProductiveLoans* variable, we selected four of these purposes: (2) purchase other real estate, (3) refurbish or renovate the residence, (6) consolidate or refinance debts, and (7) for education purposes. Each of these loan purposes offers an opportunity to enhance a household's economic condition over time, although the benefits may manifest at different intervals. For instance, purchasing additional properties can allow a household to earn rental income or benefit from property redevelopment, while refurbishing a residence may lead to an increase in its value. In addition, refinancing debt can enable a household to secure better interest rates or more favorable terms, thereby improving its current financial status. Finally, investments in human capital can produce future returns that more than offset the cost of the debt incurred ([Card, 1999](#); [Avery and Turner, 2012](#); [Barrow and Malamud, 2015](#)).

Fig. 2 illustrates the average total amount of productive loans across countries. Cyprus and Germany display nearly identical averages of €158.4k and €152.9k, respectively. Spain comes in third with an average of €137.5k, followed by Belgium at €104.1k and Italy at €74.3k.

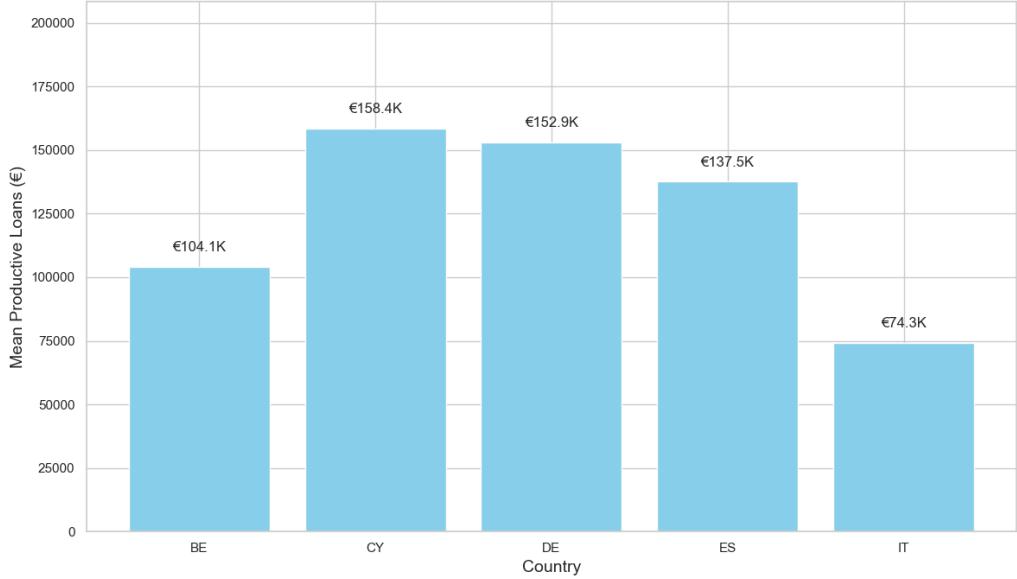


Fig. 2: Mean of Productive Borrowing by Country

The next subsection introduces the loans related to business wealth growth: *BusinessLoans*.

2.1.3. Business Loans

The explanatory variable used to measure changes in the financial health of family businesses over time is the amount of debt owed for the purpose of "financing a business or a professional activity". This variable captures the scale of borrowing dedicated to entrepreneurial activities at time $t - 1$, allowing for an analysis of its long-term impact on *BusinessWealth*.

In particular, Fig. 3 shows the distribution of the IHS-transformed total amount of loans across business wealth quintiles. The distribution displays the expected pattern, with higher borrowing amounts observed in the upper quintiles. However, the presence of notable peaks in loan amounts attributed to lower quintiles suggests that even households in the poorer categories engage in borrowing for business purposes.

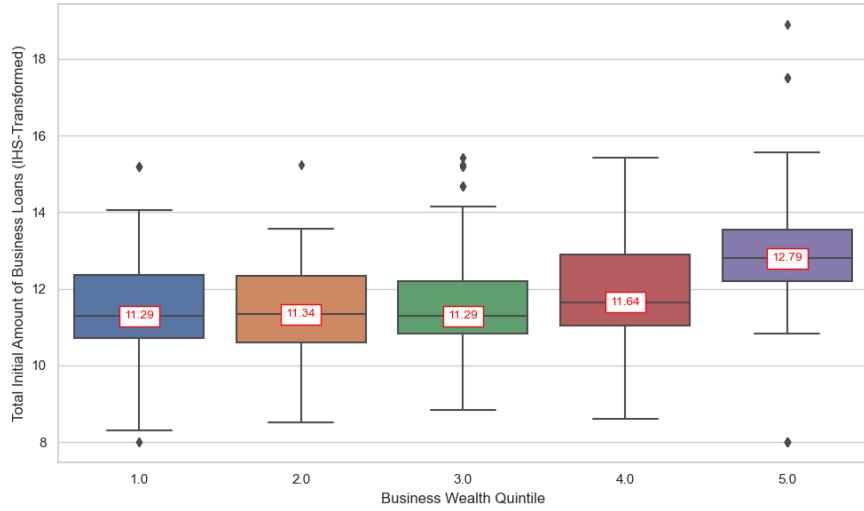


Fig. 3: Distribution of Business Loans by Business Wealth Quintile

Given the substantial mobility observed in Figure 1 — where 33.3% of households belonging to the lowest quintile in 2011 moved to the top two quintiles by 2020 — it is plausible that high levels of business loans in the lower quintiles are contributing to these upward movements. This suggests that even at lower levels of wealth, households may use borrowing as a tool for wealth creation, which could explain their transition to higher wealth quintiles over time.

Table 3 presents summary statistics for all variables used in the estimations. Monetary variables are multiply imputed to address item non-response using stochastic imputation: for each missing entry, five values are provided, yielding five complete datasets. Finally, demographic controls are defined with reference to the household reference person, following the [UNECE \(2011\)](#) guidelines.³

³The reference person is uniquely determined by applying the following sequential cri-

Table 3: Descriptive Statistics

Variable	N	Mean	SD	Min	Max
Wealth & Income					
Household Income (€)	16,448	35,060	72,305	-965,000	5,032,353.5
Household Size	16,448	2.61	1.30	1	10
Net Wealth (€)	16,448	860,160	6,268,202	-57,325,272	355,300,000
Business Wealth (€)	16,448	294,916	5,456,191	0	350,000,000
Debt-to-Income Ratio	16,445	137.9	6221.6	0	981,019
Credit Constrained	14,024	0.05	0.217	0	1
Loans					
Productive Loans (€)	16,416	20,831	214,686	0	60,000,000
Business Loans (€)	16,416	6,145	292,432	0	80,000,000
Demographics					
Age	16,448	59.0	14.1	19	100
Female	16,252	0.29	0.46	0	1
Education	16,237	3.40	1.46	0	6
Labour Status	16,438	2.49	1.47	1	5
Marital Status	16,248	2.34	1.07	1	5

3. Model Specification

The analysis examines how different types of borrowing—particularly productive loans and business loans—affect household income and business wealth outcomes, respectively. Given its effectiveness in handling dynamic panel models, the estimation method chosen for this analysis is the System GMM. Potential concerns arising from alternative models, such as Ordinary Least Squares (OLS) or Fixed-Effects (FE), regard the simultaneity bias—as households with higher incomes could be able to access larger amounts of credits—and the omitted variable bias, where unobserved household traits may affect the results. System GMM addresses both issues by accounting for household heterogeneity and mitigating reverse causality through the use of lagged endogenous regressors as internal instruments. The resulting models are as follows:

$$HH_Income_{it} = \alpha + \beta_1 ProductiveLoans_{it-1} + \mathbf{X}_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (2)$$

Where:

- $ProductiveLoans_{it-1}$: Amount of productive loans owed at time $t - 1$ by household i .
- \mathbf{X}_{it} : Vector of control variables, including demographic characteristics (e.g., household size, education, age, gender, labor status, etc.), and economic factors such as lagged household net wealth and income.
- μ_i : Country fixed effects to account for unobservable, time-invariant differences across countries.
- τ_t : Time-fixed effects to control for period-specific shocks or trends affecting all households.
- ϵ_{it} : Error term.

teria: first, a partner in a de facto or registered marriage with dependent children; then, a partner in such a union without dependent children; next, a lone parent with children; if none of these apply, the person with the highest income; and finally, the oldest individual in the household.

This model examines the dynamic effect of productive loans on household income, as past investments are hypothesized to yield positive financial returns at time t . System GMM is implemented using the two-step estimation method, with standard errors clustered at the household level to account for within-group correlation. The business wealth model is specified as follows:

$$BusinessWealth_{it} = \alpha + \beta_1 BusinessLoans_{it-1} + \mathbf{X}_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (3)$$

Where:

- $BusinessLoans_{it-1}$: Amount of business loans owed at time $t - 1$ by household i .
- \mathbf{X}_{it} : Vector of control variables, including demographic characteristics (e.g., household size, education, age, gender, marital status), and economic factors such as lagged household business wealth and income.
- μ_i : Country fixed effects to account for unobservable, time-invariant differences across countries.
- τ_t : Time-fixed effects to control for period-specific shocks or trends affecting all households.
- ϵ_{it} : Error term.

Here, the focus shifts to the impact that loans used exclusively for family professional activities have on business wealth over time. The hypothesis is that, when wisely invested, this type of debt can improve a household's economic conditions over time. As in the income model, System GMM is used with the two-step method and clustered standard errors at the household level. The next section presents the results of the models.

4. Estimation Results

This section presents the results from various models. The first part examines the effect of productive debt on household income using three estimation techniques—OLS, FE, and System GMM—to compare the robustness of the findings across methods. Next, this relationship is analyzed through country-specific models to highlight variations in results across countries. Finally, a decomposition of productive debt identifies which channel of

leveraged investment has the greatest impact on household income over the observed period.

The second part conducts a similar analysis, focusing on the effect of business loans on family business wealth. As before, the robustness of the findings is tested using OLS, FE, and System GMM, along with country-specific models for each country in the analysis.

4.1. Impact of Productive Borrowing on Household Income

This subsection examines the effect of productive loans on household income. Table 4 shows the results across three estimation methods — OLS, FE, and System GMM — to assess the consistency of the findings. Given its ability to address biases arising from simultaneity and omitted variables, the primary interpretation rests on the System GMM model.

Overall, productive loans have a positive effect in all models, although they do not reach statistical significance in the FE model. In particular, the GMM estimates show that a 10% increase in productive debt in the previous period is associated with a 0.33% increase in current income. This suggests that past productive leveraged investments contribute to long-term income growth as the investments yield returns over time. In addition, net family wealth is a significant driver of income growth: a 10% higher net wealth in the previous period is associated with a 0.44% increase in income in the subsequent period.

Family size has the opposite effect, as households with more members tend to have lower income per household, while households facing difficulties accessing credit—indicated by the variable *CreditConstrained*—struggle to improve their economic position. The same is true for those in the *Unemployed*, *Retired*, and *Other* (e.g., students, social services, permanently disabled, etc.) labour status.

Conversely, households with higher levels of education report significantly higher incomes compared to those with only a primary school education, while *Age* shows the standard inverted-U pattern, where at initial increases in income correspond declines represented by Age^2 .

Table 4: Estimations of Productive Loans on Household Income

Variable	OLS	FE	GMM
Productive Loans _{t-1}	0.0106*** (0.0023)	0.0032 (0.0033)	0.0328*** (0.0090)
Household Income _{t-1}	0.2153*** (0.0337)	-0.2547*** (0.0535)	0.0704 (0.0510)
Net Wealth _{t-1}	0.0200*** (0.0030)	0.0060* (0.0036)	0.0438*** (0.0092)
Household Size _t	-0.0625*** (0.0120)	-0.0329 (0.0249)	-0.0601*** (0.0178)
Age	0.0214*** (0.0063)	0.0565*** (0.0129)	0.0188** (0.0076)
Age ²	-0.000126** (0.000055)	-0.000484*** (0.000123)	-0.000108* (0.000064)
Female	-0.0644** (0.0281)	-0.1789*** (0.0568)	-0.0617* (0.0332)
Debt Ratio	-0.00005** (0.00002)	-0.00004** (0.00002)	0.00005 (0.00008)
Credit Constrained	-0.1514*** (0.0459)	-0.0247 (0.0579)	-0.1243** (0.0562)
Education (ref. Primary)			
Lower Secondary	0.0335 (0.0533)	-0.0726 (0.0993)	0.0370 (0.0614)
Upper Secondary	0.2770*** (0.0411)	0.0875 (0.1172)	0.2770*** (0.0506)
Tertiary	0.5585*** (0.0462)	0.1852 (0.1211)	0.5855*** (0.0620)
Marital Status (ref. Single)			
Married	0.1306*** (0.0408)	0.1953** (0.0956)	0.0858* (0.0480)
Consensual Union	0.1097 (0.1179)	0.0302 (0.1839)	0.2066 (0.1375)
Widowed	0.1313** (0.0623)	0.1462 (0.1062)	0.1225* (0.0678)
Divorced	-0.0309 (0.0557)	0.0169 (0.0978)	-0.0034 (0.0629)
Labour Status (ref. Employee)			
Self-employed	-0.0091 (0.0399)	0.0254 (0.0831)	-0.0114 (0.0445)
Unemployed	-0.8959*** (0.1069)	-0.3443*** (0.1149)	-1.1857*** (0.1824)
Retired	-0.3512*** (0.0361)	-0.2982*** (0.0598)	-0.3382*** (0.0436)
Other	-0.8044*** (0.0861)	-0.5884*** (0.1308)	-0.8672*** (0.1025)
Constant	7.4723*** (0.3596)	11.8280*** (0.6136)	8.8155*** (0.4729)
Country controls	Yes	Yes	Yes
Year controls	Yes	Yes	Yes
Observations	11,023	11,023	11,021
Portmanteau Test			0.2847
Fully-collapsed Portmanteau Test			0.1130
Sargan-Hansen Test (2-step)			0.5029
Sargan-Hansen Test (3-step)			0.4782

Notes: The dependent variable is Household Income_t. Standard errors are clustered at the household level and reported in parentheses. All estimates have been multiply imputed. Monetary variables have been transformed using the Inverse Hyperbolic Sine (IHS) function. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

The post-estimation test results indicate no issues with autocorrelation in the errors, as both Portmanteau tests return p-values above the standard significance thresholds. Additionally, the Sargan-Hansen tests for over-identification suggest that the instruments are valid, further supporting the robustness of the System GMM estimates. The next section breaks down the results across countries.

4.1.1. Country-Specific Analysis: Household Income

This section examines the impact of productive loans on household income across the countries. As shown in Table 5, the results are largely consistent with those obtained from the aggregated sample. Notably, Germany exhibits the most substantial returns, with a 10% productive investment yielding a 0.28% increase in household income over time. Cyprus and Belgium attain comparable outcomes, while Spain and Italy results do not reach statistical significance.

The control variables exhibit a behavior analogous to previous estimates, and post-estimation tests confirm the models' validity only for those countries reporting significant estimates.

The following section further decomposes the impact of each type of debt on household income, identifying the main channels through which the positive effect materializes.

Table 5: GMM Estimations of Productive Loans on Household Income by Country

Variable	Belgium	Cyprus	Germany	Italy	Spain
Productive Loans _{t-1}	0.0193* (0.0106)	0.0247* (0.0136)	0.0279* (0.0152)	0.0075 (0.0272)	0.0660 (0.0462)
Household Income _{t-1}	0.1690*** (0.0478)	0.0487 (0.0999)	0.0020 (0.0215)	0.0510 (0.0858)	-0.1179 (0.1512)
Net Wealth _{t-1}	0.0377** (0.0158)	0.0249* (0.0150)	0.0550*** (0.0111)	0.0780** (0.0302)	0.0576*** (0.0211)
Household Size _t	-0.0961*** (0.0227)	-0.0592* (0.0315)	-0.0294 (0.0221)	-0.1092*** (0.0379)	-0.1692*** (0.0479)
Age	0.0102 (0.0199)	0.0489*** (0.0149)	0.0167* (0.0098)	0.0085 (0.0184)	0.0182 (0.0259)
Age ²	-0.0001 (0.0002)	-0.000387*** (0.000141)	-0.000126 (0.000088)	-0.000010 (0.000145)	-0.000072 (0.000223)
Female	-0.0135 (0.0433)	-0.0914 (0.0668)	-0.0494 (0.0402)	-0.1057 (0.0826)	0.0566 (0.1387)
Debt Ratio	0.0672 (0.1369)	-0.000055 (0.000054)	0.000004 (0.000113)	-0.007215 (0.006399)	-0.000153 (0.000126)
Credit Constrained	-0.2671 (0.3242)	-0.0783 (0.0919)	-0.0638 (0.1053)	0.3802 (0.6751)	-0.2680** (0.1174)
Education (ref. Primary)					
Lower Secondary	-0.0559 (0.0940)	0.2606** (0.1036)	0.2315 (0.2340)	0.2835*** (0.1077)	0.0145 (0.1644)
Upper Secondary	0.0270 (0.0895)	0.2327*** (0.0847)	0.3707* (0.2215)	0.4788*** (0.1088)	0.4303*** (0.1352)
Tertiary	0.2472** (0.1004)	0.7384*** (0.1118)	0.6488*** (0.2209)	0.9164*** (0.1123)	0.7951*** (0.1751)
Marital Status (ref. Single)					
Married	0.1486 (0.0924)	0.3115 (0.1985)	0.1330** (0.0640)	0.1966* (0.1151)	0.1985 (0.1481)
Consensual Union	0.1772 (0.1407)	0.3271 (0.3251)	0.4380 (0.2358)	—	0.5649** (0.2357)
Widowed	0.1122 (0.0957)	0.2777 (0.2328)	0.1353* (0.0768)	0.3611* (0.1877)	-0.0413 (0.1638)
Divorced	-0.0972 (0.1450)	0.0562 (0.2128)	0.0397 (0.0855)	0.0869 (0.1441)	-0.0638 (0.1778)
Labour Status (ref. Employee)					
Self-employed	-0.0648 (0.0902)	-0.2270*** (0.0671)	0.0699 (0.0819)	0.0268 (0.1119)	0.2150* (0.1213)
Unemployed	-0.7005*** (0.1801)	-0.8403*** (0.2615)	-0.5916*** (0.1587)	-0.5972 (1.2420)	-0.7329*** (0.1883)
Retired	-0.3424*** (0.0665)	-0.2727** (0.1181)	-0.3173*** (0.0610)	-0.1650* (0.0943)	-0.3933*** (0.1456)
Other	-0.4695 (0.3459)	-1.5209*** (0.4430)	-0.9918*** (0.2236)	-0.6958*** (0.2242)	-0.5570** (0.2234)
Constant	8.5369*** (0.7847)	7.7550*** (0.7742)	9.5545*** (0.3670)	8.3471*** (1.2366)	10.1954*** (1.5758)
Year controls	Yes	Yes	Yes	Yes	Yes
Observations	1,005	1,869	3,632	2,092	2,423
Portmanteau Test	0.1727	0.3887	0.2571	—	0.0062
Fully-collapsed Portmanteau Test	0.5480	0.3394	0.8767	—	0.0016
Sargan-Hansen Test (2-step)	0.1403	0.2357	0.9458	0.1354	0.5701
Sargan-Hansen Test (3-step)	0.0943	0.0953	0.7542	0.0876	0.4054

Notes: The dependent variable is Household Income_t. Standard errors are clustered at the household level and reported in parentheses. All estimates have been multiply imputed. Monetary variables have been transformed using the Inverse Hyperbolic Sine (IHS) function. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.1.2. Decomposed Effects of Productive Borrowing

This sub-section examines the decomposed effects of productive borrowing on household income. In particular, productive borrowing is broken down by its various credit lines—namely, real estate loans, education loans, and refinancing loans—and the effect of each on household income is evaluated. The analysis is conducted using parametric regression models, and the results include the Controlled Direct Effects (CDE), the Natural Indirect Effects (NIE), and the Total Effects (TE) for each type of debt. The CDE captures the effect of productive debt while controlling for each credit line, whereas the NIE reflects the individual effect of each mediator (i.e., real estate, education, and refinancing) on household income. Finally, the TE represents the sum of these two effects.

Table 6 presents the results of the causal mediation analysis. In line with previous GMM estimates, the TE indicates a positive and significant effect of productive debt on income across all specifications. In particular, a 10% increase in productive debt is associated with a 0.24% increase in income. However, the analysis also reveals important differences. Notably, the NIE for education contributes negatively to household income. This finding suggest that—as demonstrated by Black et al. (2023)—education debt takes longer to yield a return on investment, potentially due to delays in employment that postpone the realization of education’s potential. In addition, while refinancing can provide short-term relief through reduced interest rates and lower monthly payments, it does not lead to significant income benefits.

Table 6: Mediated Results for Productive Borrowing on Income

Debt Type	CDE (Controlled Direct Effect)	NIE (Natural Indirect Effect)	TE (Total Effect)
Real Estate Debt	0.0123*** (0.0043)	0.0117*** (0.0035)	0.0240*** (0.0025)
Education Debt	0.0278*** (0.0027)	-0.0038*** (0.0009)	0.0240*** (0.0025)
Refinancing Debt	0.0248*** (0.0026)	-0.0008 (0.0008)	0.0240*** (0.0025)

Notes: The analysis is conducted using the *paramed* package, implementing causal mediation analysis via parametric regression models. CDE represents the controlled direct effect of productive borrowing on income. NIE represents the natural indirect effect via the corresponding debt type. TE is the total effect, combining both direct and indirect effects. All estimates have been multiply imputed. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

In contrast, the NIE for real estate debt is positive and significant at the 1% level. This suggests that leveraged investments in additional real estate are the primary driver of increases in household income—potentially through rental income generation or property value appreciation.

These findings complement the results from the System GMM models

and highlight the importance of distinguishing between different debt types when analyzing the broader economic effects of household borrowing.

The next section studies the long-term impact of business loans on household business wealth.

4.2. Impact of Productive Borrowing on Business Wealth

This sub-section presents the results obtained from the business wealth model. The analysis focuses on the impact that the amount of loans taken to finance a business or professional activity has on the financial viability of the business. Table 7 displays the results across three estimation methods—OLS, FE, and System GMM—to compare the robustness of the findings. GMM estimates reveal that a 10% increase in business debt in period $t - 1$ is associated with an 8.8% increase in the total value of family businesses in the subsequent period. These findings support the initial hypothesis that well-calibrated investments, enabled by access to credit, can improve household financial conditions over time. The control variables largely behave as expected: the *Age* variable shows an inverted-U pattern, where at initial increases in wealth correspond declines represented by Age^2 . Higher education is also a significant factor in business wealth accumulation. Unlike in the income model, *HouseholdSize* contributes positively to business wealth, while the *Female* variable indicates that female respondents are associated with lower business wealth.

Finally, post-estimation tests confirm the validity of the model: Portmanteau tests indicate no issues with autocorrelation in the errors, and the Sargan-Hansen tests suggest that the instruments used in the GMM model are valid. The next section explores the respective estimates across countries.

Table 7: Estimations of Business Loans on Business Wealth

Variable	OLS	FE	GMM
Business Loans $_{t-1}$	0.0803*** (0.0254)	0.0360 (0.0282)	0.8885*** (0.2450)
Business Wealth $_{t-1}$	0.6169*** (0.0130)	-0.181*** (0.0168)	0.1885 (0.1804)
Household Income $_{t-1}$	0.0775** (0.0338)	-0.0037 (0.0282)	0.2581*** (0.0974)
Household Size $_t$	0.2594*** (0.0366)	0.4387*** (0.0792)	0.3133*** (0.1065)
Age	0.0698*** (0.0177)	0.1418*** (0.0338)	0.0055 (0.0672)
Age 2	-0.0006*** (0.0001)	-0.0013*** (0.0003)	-0.00007 (0.0006)
Female	-0.2162*** (0.0763)	-0.1225 (0.1447)	-0.3176*** (0.1054)
Education (ref. Primary)			
Lower Secondary	0.0905 (0.1015)	-0.2844 (0.1891)	0.2933* (0.1536)
Upper Secondary	0.3063*** (0.0980)	-0.1165 (0.2580)	0.6402*** (0.1944)
Tertiary	0.6019*** (0.1089)	-0.1865 (0.2926)	1.2060*** (0.2859)
Marital Status (ref. Single)			
Married	-0.1248 (0.1069)	-0.0963 (0.2921)	0.0912 (0.1776)
Consensual Union	-0.6420* (0.3369)	-0.2316 (0.4431)	-1.2007** (0.5033)
Widowed	0.0546 (0.1199)	-0.3091 (0.2975)	0.0352 (0.1693)
Divorced	-0.0735 (0.1289)	0.0330 (0.3054)	-0.0060 (0.1976)
Constant	-3.1656*** (0.6407)	-2.077** (1.0386)	-3.5564 (2.5436)
Country controls	Yes	Yes	Yes
Year controls	Yes	Yes	Yes
Observations	12,310	12,310	12,309
Portmanteau Test			0.2239
Fully-collapsed Portmanteau Test			0.0952
Sargan-Hansen Test (2-step)			0.8229
Sargan-Hansen Test (3-step)			0.8337

Notes: Clustered standard errors are reported in parentheses. All estimates have been multiply imputed. The dependent variable is Business_Wealth $_t$. All monetary variables have been transformed using the Inverse Hyperbolic Sine (IHS) function. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.2.1. Country-Specific Analysis: Business Wealth

Table 8 illustrates how the effectiveness in boosting family business wealth of loans taken for professional activities varies by country. These estimates are influenced by smaller sample sizes in some countries, as fewer families incur debt for this purpose compared to the aggregate sample. Notably, Italy and Cyprus produce results consistent with previous findings: a 10% increase in debt used to finance a business corresponds to a 0.9% and 0.43% rise in business wealth, respectively. In Germany and Spain, although the trends align with initial expectations, the results lack statistical significance. Conversely, Belgium shows an opposite trend, but its findings are also not statistically significant. Additionally, post-estimation tests fail for countries with insignificant results, indicating issues with the model's validity in those cases.

Overall, where the GMM models pass the tests, the results reinforce the positive role of business-related borrowing in enhancing business wealth, supporting the hypothesis that investments financed by debt contribute to long-term wealth accumulation. The next section concludes the paper by summarizing its main contributions and suggesting directions for future research.

Table 8: GMM Estimations of Business Loans on Business Wealth by Country

Variable	Belgium	Cyprus	Germany	Italy	Spain
Business Loans _{t-1}	-3.2065 (6.1856)	0.4283** (0.1785)	0.3214 (0.4011)	0.9061** (0.3587)	0.4409 (0.3049)
Business Wealth _{t-1}	0.8718*** (0.2906)	0.1041 (0.2323)	0.5294* (0.2999)	0.3957** (0.1761)	0.8236*** (0.1493)
Household Income _{t-1}	-0.0546 (0.1234)	0.3096* (0.1886)	0.1242 (0.1812)	0.1632** (0.0755)	-0.0087 (0.0738)
Household Size _t	0.1664 (0.2336)	0.3878* (0.2053)	0.1609 (0.1513)	0.2233* (0.1159)	-0.0440 (0.1365)
Age	0.0589 (0.2289)	0.1515 (0.1054)	0.1564* (0.0818)	-0.2506* (0.1362)	0.0665 (0.1467)
Age ²	-0.0005 (0.0018)	-0.0013 (0.0010)	-0.00145** (0.00070)	0.00188* (0.0011)	-0.00055 (0.0012)
Female	-0.1437 (0.2461)	-1.0412*** (0.3844)	0.0777 (0.1632)	-0.2002 (0.1400)	-0.1795 (0.1962)
Education (ref. Primary)					
Lower Secondary	-0.1855 (0.2684)	2.6879* (1.4206)	-0.1571 (0.3099)	0.1445 (0.1326)	0.3250 (0.2372)
Upper Secondary	0.0299 (0.2264)	0.9496 (0.6721)	-0.0794 (0.3055)	0.2829** (0.1332)	0.2464 (0.2807)
Tertiary	0.0378 (0.1989)	1.4875** (0.7501)	0.22295 (0.3575)	0.8777*** (0.2477)	0.5679 (0.3594)
Marital Status (ref. Single)					
Married	-0.5287 (0.5028)	-0.0381 (0.6194)	-0.0842 (0.2461)	0.0876 (0.2350)	0.4044 (0.2604)
Consensual Union	-0.9112** (0.4115)	-0.5599 (0.8391)	2.4876 (1.9589)	—	0.0940 (0.6901)
Widowed	-0.5357 (0.3629)	0.7644 (0.6949)	-0.0436 (0.2388)	0.0583 (0.2192)	0.4448 (0.2809)
Divorced	-0.4949* (0.2697)	-0.0509 (0.6121)	-0.2063 (0.2768)	0.1843 (0.3086)	0.3437 (0.3318)
Constant	-1.034 (7.3410)	-7.2835* (3.7047)	-5.2315 (3.2096)	6.1735 (3.9462)	-2.0246 (4.2261)
Year controls	Yes	Yes	Yes	Yes	Yes
Observations	1,005	1,869	3,632	3,377	2,426
Portmanteau Test	0.0251	0.4532	0.0408	0.6221	0.0002
Fully-collapsed Portmanteau Test	0.0847	0.3198	0.0198	0.3740	0.0000
Sargan-Hansen Test (2-step)	0.2824	0.1425	0.0299	0.1200	0.2794
Sargan-Hansen Test (3-step)	0.1640	0.1222	0.0299	0.1691	0.2822

Notes: Clustered standard errors are reported in parentheses. All estimates have been multiply imputed. The dependent variable is Household Income_t. All monetary variables have been transformed using the Inverse Hyperbolic Sine (IHS) function. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

5. Conclusion

The 2008 financial crisis led to a restructuring of the dynamics between financial institutions and individuals, with considerable variations among countries. Before the crisis, the European securitisation market was about three-quarters the size of U.S. issuance; by 2020, it had dropped to just 6%⁴. This reduction in the private sector's capacity is also reflected in the differing levels of household indebtedness between European and Anglo-Saxon nations. The aggregate euro area household debt-to-GDP ratio fell from roughly 64% at the peak in 2009 to about 52% of GDP by 2024⁵. In comparison, that of Australia and Canada stands at about 110% and 102%, respectively⁶. These figures suggest that the measures implemented to mitigate the risks of a new crisis have been partially successful, and caution now reigns supreme in European credit markets.

At the same time, the academic narrative on household debt has adapted to the current historical context. In the wake of the financial crisis, numerous studies have examined the effects of rapid credit growth on countries' economic stability (Jordà et al., 2013; Schularick and Taylor, 2012). The fear of another crisis has prompted several authors to investigate the impact of high levels of indebtedness on household consumption (Aladangady, 2017; Fagereng and Halvorsen, 2016), and its subsequent macroeconomic repercussions (Mian et al., 2015; Zabai, 2017). While these studies offer important insights, they overlook the possibility that household investments contribute to wealth accumulation over time. By treating household debt in aggregate, and assuming its sole purpose is to increase consumption, such studies fail to capture the wealth-generating potential of leveraged household investments.

Using data from the Household Finance and Consumption Survey (HFCS), this study aims to fill this gap by proposing an innovative interpretation

⁴European Stability Mechanism: Reviving securitisation in Europe for CMU. <https://www.esm.europa.eu/blog/reviving-securitisation-europe-cmu>. Accessed 10 March 2025

⁵European Central Bank: Euro area economic and financial developments by institutional sector. [⁶International Monetary Fund: Household debt, loans and debt securities. \[https://www.imf.org/external/datamapper/HH_LS@GDD/CAN/GBR/USA/DEU/ITA/FRA/JPN/VNM\]\(https://www.imf.org/external/datamapper/HH_LS@GDD/CAN/GBR/USA/DEU/ITA/FRA/JPN/VNM\). Accessed 10 March 2025](https://www.ecb.europa.eu/press/stats/ffi/html/ecb.eaefd_full2024q3~a6fab3ee62.en.html#:~:text=The%20household%20debt%2Dto%2Dincome,2023%20(see%20Chart%202). Accessed 10 March 2025</p></div><div data-bbox=)

of household debt. In particular, this study analyzes the effect of productive indebtedness—loans with future wealth-generating potential—on two key household economic variables: income and business wealth. The hypothesis is that, in the medium to long term, these investments yield benefits that exceed the cost of the debt incurred. To evaluate this proposition, we employ a System GMM model which effectively addresses endogeneity concerns through internal instrumental variables.

The results confirm our hypothesis. Specifically, household income increases by approximately 0.33% following a 10% increase in productive household debt in the previous period. Similarly, business wealth is positively affected by loans used to finance family professional activities, with increases of around 9% corresponding to a 10% higher loan amount. These outcomes vary among the countries analyzed: income improvements are evident in Belgium, Cyprus, and Germany, whereas business wealth shows significant positive results mainly in Cyprus and Italy. Furthermore, to identify the most effective transmission channel for boosting income, our causal mediation analysis reveals that loans taken out to purchase additional real estate have the greatest impact, suggesting that income increases primarily stem from higher rental revenue. In contrast, education loans likely require more time to exhibit their positive effects⁷, as do refinancing loans. Future research could benefit from longer time horizons and a greater number of data points, which would allow for more in-depth analyses across various population subgroups (e.g., by age or income bracket). Additionally, including more lags in the models might enhance our understanding of how responsive these outcomes are to changes in the temporal horizons. Nevertheless, we are convinced that this work provides significant contributions to the literature. This study is the first to propose an innovative framework that views households not merely as consumption units, but as economic actors that utilize their resources to improve their financial conditions over time.

Moreover, this is the first study to disaggregate household debt according to the purposes for which it is incurred. By attributing the same goals to consumption loans as to productive loans, previous research has effectively downplayed the household's productive capacity and its role in the economy. By utilizing micro-data from the HFCS, our work demonstrates how different categories of debt influence household economic variables, highlighting

⁷(Black et al., 2023) identifies a period of 10 years

wealth-generation channels that have been overlooked in aggregated debt analyses.

In conclusion, we believe this study represents an important first step toward a new interpretation of household debt. By emphasizing the purpose of debt and adopting a micro-level perspective, it opens new avenues for research on household finance and lays the groundwork for future studies on financial mobility.

Declarations

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Data availability: The dataset analyzed during the current study is available upon request to researchers at https://www.ecb.europa.eu/stats/ecb_surveys/hfcs/html/index.en.html.

References

- Aladangady, A., 2017. Housing wealth and consumption: Evidence from geographically linked microdata. *American Economic Review* 107, 3415–3446. doi:[10.1257/aer.20150491](https://doi.org/10.1257/aer.20150491).
- Avery, C., Turner, S., 2012. Student loans: Do college students borrow too much—or not enough? *Journal of Economic Perspectives* 26, 165–192. doi:[10.1257/jep.26.1.165](https://doi.org/10.1257/jep.26.1.165).
- Baker, S.R., 2018. Debt and the response to household income shocks. *Journal of Political Economy* 126, 1504–1557. URL: <https://www.jstor.org/stable/10.2307/26550504>, doi:[10.1086/698106](https://doi.org/10.1086/698106).
- Barrow, L., Malamud, O., 2015. Is college a worthwhile investment? *Annual Review of Economics* 7, 519–555. URL:

<http://dx.doi.org/10.1146/annurev-economics-080614-115510>,
doi:[10.1146/annurev-economics-080614-115510](https://doi.org/10.1146/annurev-economics-080614-115510).

Berisha, E., Meszaros, J., 2018. Household debt, expected economic conditions, and income inequality. International Journal of Finance & Economics 23, 283–295. URL: <https://doi.org/10.1002/ijfe.1616>, doi:[10.1002/ijfe.1616](https://doi.org/10.1002/ijfe.1616).

Black, S.E., Denning, J.T., Dettling, L.J., Goodman, S., Turner, L.J., 2023. Taking it to the limit: Effects of increased student loan availability on attainment, earnings, and financial well-being. American Economic Review 113, 3357–3400. doi:[10.1257/aer.20210926](https://doi.org/10.1257/aer.20210926).

Card, D., 1999. The causal effect of education on earnings, in: Ashenfelter, O., Card, D. (Eds.), Handbook of Labor Economics, Volume 3. Elsevier Science B.V., pp. 1802–1823. PII: S1573-4463(99)03011-4.

Causa, O., Woloszko, N., Leite, D., 2019. Housing, Wealth Accumulation and Wealth Distribution: Evidence and Stylized Facts. OECD Economics Department Working Papers No. 1588. Organisation for Economic Co-operation and Development (OECD). Paris, France. URL: <https://www.oecd.org/eco/workingpapers>.

Du Caju, P., Périlleux, G., Rycx, F., Tojerow, I., 2023. A bigger house at the cost of an empty stomach? the effect of households' indebtedness on their consumption: micro-evidence using belgian hfcs data. Review of Economics of the Household 21, 291–333. URL: <https://doi.org/10.1007/s11150-022-09605-x>, doi:[10.1007/s11150-022-09605-x](https://doi.org/10.1007/s11150-022-09605-x).

Fagereng, A., Halvorsen, E., 2016. Debt and household consumption responses. Norges Bank Working Paper URL: <https://www.norges-bank.no/en/news-events/news-publications/Papers/Working-papers/2016/2016-10/>.

Gorton, G., Ordoñez, G., 2016. Good Booms, Bad Booms. NBER Working Paper Series 22008. National Bureau of Economic Research. URL: <http://www.nber.org/papers/w22008>.

Jordà, Ó., Schularick, M., Taylor, A.M., 2013. When credit bites back. Journal of Money, Credit and Banking 45. Received October 16, 2012; accepted in revised form June 6, 2013. C© 2013 The Ohio State University.

- Jordà, Ó., Schularick, M., Taylor, A.M., 2014. The Great Mortgaging: Housing Finance, Crises, and Business Cycles. NBER Working Paper 20501. National Bureau of Economic Research. Cambridge, MA. URL: <http://www.nber.org/papers/w20501>. working Paper in the NBER Working Paper Series.
- Jordà, Ó., Schularick, M., Taylor, A.M., 2015. Betting the house. Journal of International Economics 96, S2–S18. URL: <http://dx.doi.org/10.1016/j.jinteco.2014.12.011>, doi:[10.1016/j.jinteco.2014.12.011](https://doi.org/10.1016/j.jinteco.2014.12.011).
- Lombardi, M., Mohanty, M., Shim, I., 2017. The real effects of household debt in the short and long run. BIS Working Papers URL: <https://ssrn.com/abstract=2906555>.
- Mason, J.W., 2018. Income distribution, household debt, and aggregate demand: A critical assessment. Levy Economics Institute of Bard College Working Paper URL: https://www.levyinstitute.org/pubs/wp_897.pdf.
- Mian, A.R., Sufi, A., Verner, E., 2015. Household debt and business cycles worldwide. National Bureau of Economic Research Working Paper URL: <http://www.nber.org/papers/w21581>.
- Moore, G.L., Stockhammer, E., 2018. The drivers of household indebtedness reconsidered: An empirical evaluation of competing arguments on the macroeconomic determinants of household indebtedness in oecd countries. Journal of Post Keynesian Economics 41, 547–577. URL: <https://doi.org/10.1080/01603477.2018.1486207>, doi:[10.1080/01603477.2018.1486207](https://doi.org/10.1080/01603477.2018.1486207).
- Pence, K., 2006. The role of wealth transformations: An application to estimating the effect of tax incentives on saving. The B.E. Journal of Economic Analysis & Policy 5. doi:[10.1515/1538-0645.1430](https://doi.org/10.1515/1538-0645.1430). available at: <http://dx.doi.org/10.1515/1538-0645.1430>.
- Schularick, M., Taylor, A.M., 2012. Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870–2008. American Economic Review 102, 1029–1061. URL: <http://dx.doi.org/10.1257/aer.102.2.1029>, doi:[10.1257/aer.102.2.1029](https://doi.org/10.1257/aer.102.2.1029).

- Setterfield, M., Kim, Y.K., 2016. Debt servicing, aggregate consumption, and growth. Structural Change and Economic Dynamics 36, 22–33. URL: <https://doi.org/10.1016/j.strueco.2015.10.002>, doi:10.1016/j.strueco.2015.10.002.
- UNECE, 2011. Canberra Group Handbook on Household Income Statistics. Second edition ed., United Nations, New York and Geneva. URL: <https://unece.org/statistics/publications/canberra-group-handbook-household-income-statistics-second-edition>.
- Zabai, A., 2017. Household debt: Recent developments and challenges. BIS Quarterly Review December 2017, 39–52. URL: <https://ssrn.com/abstract=3082582>.