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Household debt persistence and its drivers: Evidence from cross-country growth heterogeneity

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Abstract

Household indebtedness has been a major policy concern since the 2008 financial crisis. In the current context, understanding the drivers of household debt is a more pressing issue than ever, as they affect economic stability and resilience. The aim of the paper is to examine the determinants of household debt using a comprehensive dataset spanning 36 countries and the period from 2012 to 2022. We employ dynamic panel regression models to explore the drivers of household indebtedness. Our results indicate that the Consumer Confidence Index positively influences household debt across all samples, while the COVID-19 pandemic reduced debt levels. Similarly, bank policies that tighten lending standards reduce household debt, whereas greater credit availability encourages borrowing. On the other

Keywords

- household debt
- consumer confidence
- bank lending policy
- life expectancy
- labour force
- COVID-19

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hand, a larger working-age population appears to reduce consumer indebtedness, while life expectancy contributes to its growth. This highlights the complex role of consumption-oriented explanations in shaping borrowing behaviour.

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Introduction

The fierce surge in household debt has been one of the main issues of interest to policymakers, especially after 2008 (Aziz et al., 2024). Household borrowing relative to disposable income between 2000 and 2023 grew substantially in almost all OECD-reporting countries, with Germany the sole exception. The ratio reached a record value in Norway (over 250%), while Lithuania experienced the most rapid expansion at over 1300% (OECD, n.d.). Understanding household financial performance and its determinants is essential for three reasons. Firstly, household debt and the ability to service the obligations affect institutions' profitability, capital and liquidity and, indirectly, financial stability. Indeed, as demonstrated by Ho et al. (2016), the problem of excessive household indebtedness is established to have initiated economic slowdown and financial crises. This is confirmed by Romão and Barradas (2024), who argue that Portuguese households' indebtedness played a crucial role in the recent sovereign debt crisis. Moreover, Barbaglia et al. (2024) conclude that regions in which household leverage increased more rapidly experienced more severe declines in output and employment. Secondly, debt-fuelled consumption affects GDP (Radulescu et al., 2019). Thirdly, as debt servicing consumes an increasing share of household spending, the possibility of achieving the expected standard of living is reduced, which generates adverse social effects and radicalisation of political choices. The problem of dynamic household debt growth impacts both advanced economies and emerging markets (Abd Samad et al., 2020). However, the most highly indebted households are in countries where incomes are typically high, and housing market boom-bust cycles have occurred (Demertzis et al., 2020). For these reasons, and to ensure that over-indebtedness does not escalate (Frigerio et al., 2020), it is important to identify the determinants of household indebtedness. Household financial behaviour and conditions can be predicted using objective criteria (such as macroeconomic fundamentals, societal structural variables, bank credit policy, and the quality of institutions and regulations) and subjective indicators, such as consumer confidence (Kłopocka, 2017).

Our study aims to explore the determinants impacting household indebtedness, emphasising the dichotomy of channels of influence (supply-side or demand-side variables). To fill a research gap identified in the literature, particular attention is paid to the role of the factors that may have most significantly influenced household decisions in recent years, namely consumer confidence approximated by the Consumer Confidence Index (CCI). This is due to the suspicion that escalating geopolitical risks may have distorted the impact of economic sentiment on household debt. Additionally, we analyse the COVID-19 pandemic and consumption-oriented variables related to demographic structure. Therefore, the article aims to verify the relevance and direction of these variables' impact on household debt.

In our view, consumer confidence stands out as one of the most intriguing and pivotal research areas, particularly given its debated role in shaping future economic activity. Consumer confidence is found to be a determinant of consumption (Acuña et al., 2020; Campelo et al., 2020; Mynaříková & Pošta, 2023), GDP (Chua & Tsiaplias, 2009; Matošec & Obuljen Zoričić, 2019), stock returns (Rojo-Suárez & Alonso-Conde, 2020), property investment of households (Khan et al., 2026), housing prices' connectedness (Balcilar et al., 2024), and savings (Kłopocka & Górka, 2021). Demirel and Seyfettin (2017) identify a bidirectional causality relationship between consumer confidence and consumption expenditure, industrial production and inflation, along with a unidirectional relationship between the level of confidence and the unemployment rate.

Our study investigates the determinants of household debt using a comprehensive dataset of 36 countries worldwide from 2012 to 2022. This period covers important economic shifts, including recovery from the post-subprime crisis, the prolonged period of low interest rates and non-standard monetary policy measures (Wierzbowska, 2021), housing market fluctuations, rising income inequality, major policy interventions, and the disruptive effects of the COVID-19 pandemic (Karkowska et al., 2023), followed by an increase in inflation and interest rate hikes. To explore the significance of household indebtedness determinants, we employ dynamic panel regression models using Generalised Method of Moments (GMM) estimators. These allow us to track variable dynamics while accommodating individual heterogeneity and reducing potential estimation biases.

Our approach is novel in taking into account how life expectancy at birth and working participation ratio impact on household debt. It is also the first study to examine COVID-19's influence on the relationship between consumer confidence and household debt, disaggregated by economies with low and high GDP per capita. The results provide new insights into the determinants of household debt. In particular, the COVID-19 period was associated with lower debt levels. Moreover, it was found that the impact of consumer confidence on household debt is relatively greater in countries with comparably higher GDP per capita growth.

The remainder of this article is structured as follows. Section 1 reviews the literature and develops hypotheses. Section 2 describes the data and methodology employed in the empirical research. Section 3 presents and discusses the main results, and Section 4 provides robustness checks. The last section summarises and presents the main conclusions and policy implications.

1. Theoretical background, literature review and hypotheses development

1.1. Household indebtedness and consumption— theoretical framework

In outlining the theoretical background for considering the rationale for household indebtedness, reference should be made to the life-cycle hypothesis developed by Modigliani and Brumberg (1954). It assumes that a household's consumption level exceeds its current income during youth. This gap is filled by consumer credit, the repayment of which is supposed to come from income increasing in the future. Thus, the 'life-cycle' hypothesis (LCH) assumes that people take on credit when they are younger and pay it off as they age (Comelli, 2021). The support for the LCH is Friedman's (1957) permanent income hypothesis (PIH), according to which the consumers make purchasing decisions based not on current but on projected levels of disposable income. In contrast, Ando and Modigliani (1963), referring to an earlier version of the LCH, argue that many people dissave when young, accumulate wealth in middle age, and consume in retirement. The LCH and PIH thus consider indebtedness a tool for smoothing consumption over the household life cycle.

1.2. Taxonomy of household debt determinants

The determinants of the ratio of household debt to GDP, disposable income or net worth, can be classified into demand- and supply-side factors (Coletta et al., 2019). A separate variable that influences households' decisions regarding borrowing (demand-side factor) and lending policy (supply-side factor) is a crisis, particularly a pandemic crisis (Mamatzakis et al., 2023; Yue et al., 2020). Moreover, macroeconomic determinants affect both the demand for and supply of loans granted to households (Dumitrescu et al., 2022).

1.3. Model of state and consumer confidence

A cross-country comparative analysis of household debt reveals how debt levels are influenced by the model of the state (its commitment to social objectives), and also the structure of society. The first theme concerns the impact of consumer confidence on household debt, as shown by Gholipour et al. (2023), who analysed data from 35 OECD countries and established that higher levels of government economic support increased consumer confidence. The functioning of the state and the extent to which the idea of the welfare state is implemented directly impact consumer finance and, indirectly, household indebtedness. The welfare state facilitates rational life planning by stabilising their financial expectations and reducing their risk aversion. Paradoxically, this is why higher indebtedness rates are recorded in Scandinavian countries (OECD, n.d.). In such countries with social-democratic and liberal welfare models, the legal framework affects household debt, which is higher than in conservative and Eastern European welfare states (Coletta et al., 2019). Moreover, Johnston et al. (2020) suggest that states which protect borrowers from income and employment insecurity (which strengthens consumer confidence) are associated with higher household indebtedness. In contrast, liberal economies have comparatively lower household indebtedness. Growth of welfare expenditures affects the increase in household indebtedness, which is confirmed by Aziz et al. (2024), Abd Samad et al. (2023), Coletta et al. (2019), as well as Moore and Stockhammer (2018). Divergence in household debt across countries is a function of the welfare state's orientation toward old-age provisions and the insider/outsider cleavage in the labour market (Comelli, 2021).

The opposite relationship is indicated by Hu (2024), who identifies financial welfare retrenchment as a key factor affecting an upsurge in household leverage, echoing Moore and Stockhammer (2018), who suggest that the rolling back of the welfare state drives household indebtedness. Pan (2023) examines the effects of populism on household debt in 30 countries and documents how left-wing populism diminishes household debt by reducing household consumption while right-wing populism diminishes household debt by increasing public debt. Both types of populism decrease household debt by reducing lenders' willingness to lend.

1.4. Consumer confidence among demand-driven factors of household interest in borrowing

Gric et al. (2022) differentiate between rational (driven by macroeconomic fundamentals), and irrational (excessive) consumer sentiment, which re-

flects households' optimism or pessimism in addition to rationally derived beliefs. Household indebtedness is influenced by the extent to which changes in rational factors translate into current and future, strictly subjective, households' perceptions of their ability to service debt. Nowzohour and Stracca (2017) state that economic sentiment may be used to describe how economic agents view future economic developments. Economic sentiment covers two opposing dimensions, i.e. confidence and uncertainty (van der Wielen & Barrios, 2021).

Empirical studies indicate that economic sentiment and, in particular, consumer confidence have a significant impact on household debt. Analysing data from 15 European countries over the period 2003–2019, Gric et al. (2022) demonstrate a significantly positive role of sentiment as a determinant of household debt on top of the economic fundamentals. Rubaszek and Serwa (2014) document how the household credit-to-GDP ratio depends on both individual income uncertainty and persistence. Referring to the Polish market, Kłopocka (2017) highlights the predictive power of both composite and component consumer confidence indexes for household saving and borrowing, while Lamdin (2008) links changes in consumer sentiment to subsequent changes in revolving credit utilisation. Consumer confidence impacts not only the level of household debt but also the quality of debt servicing; Wadud et al. (2020) demonstrate how improved current consumer sentiment significantly induces lower mortgage, credit card and automobile loan defaults.

Higher certainty regarding the amount and stability of income strengthens consumer confidence, which in turn expands household debt. This leads us to hypothesise that:

H1: A higher consumer confidence index leads to increased household borrowing.

1.5. Structural and social determinants of the demand on household borrowing

Referring to LCH and PIH, it can be argued that the dynamics and size of household indebtedness depend on the structure of the population, its income and age stratification, and the level of financial education.

Among the structural factors, income inequality comes to the fore. It positively correlates with household debt (Iacoviello, 2008; Moore & Stockhammer, 2018; Rutendo & Marozva, 2023; Stockhammer & Wildauer, 2017). Focusing on the Portuguese market, Romão and Barradas (2024) demonstrate the importance of consumption-oriented variables, including the degree of personal income inequality, households' labour income, and the fraction of the work-

ing-age population. These factors are highly interrelated. For instance, a relatively large working-age population renders the labour market more competitive, thereby suppressing households' labour income and, in turn, credit-worthiness. Conversely, non-working young people are debt-free due to strict credit constraints, while the non-working elderly population tend to spend their savings (Moore & Stockhammer, 2018). In turn, baby boomers exhibit a relatively relaxed attitude toward indebtedness, especially compared with other generations (Cynamon & Fazzari, 2008). Furthermore, while a larger working population exerts a positive and significant influence on household debt (Aziz et al., 2024), this effect reverses if it is accompanied by rising unemployment, which typically leads to a decline in household debt (Dumitrescu et al., 2022; Meng et al., 2013). Assuming *ceteris paribus* that an expanding labour force may result in pressure to reduce income or an increase in unemployment, the following hypothesis is tested:

H2: An increase in the fraction of the working-age population is accompanied by a decrease in household debt.

An analysis of consumer credit across 23 EU countries for 1997–2014 (Borowski et al., 2017) indicates the population share of young people and the level of society's education as variables positively associated with household indebtedness. The importance of the population's age structure is also highlighted by Moore and Stockhammer (2018), while Ho et al. (2016) reveal that working and retirement populations in the total population affect household leverage. This corresponds with the findings of Piovarci (2021), who emphasises the negative impact of age on debt, noting how an ageing population coincides with a contraction in debt. This conclusion confirms earlier studies by Farinha (2003) and Kim (2025), who note that young people mainly incur debt in connection with the purchase of a home.

Long and Feng (2024) challenge this consensus, arguing that there is a negative correlation between a decline in the dependency ratio, a deterioration in household solvency, and an overall decline in the real income of older people. These empirical discrepancies often result from differences in the samples used; for example, in countries with welfare-state characteristics, the impact of age on debt is weak or non-existent (Dumitrescu et al., 2022). Higher life expectancy leads to a greater propensity to take on debt, which should be linked to a change in creditworthiness assessment standards (taking into account a longer repayment period), greater borrower optimism about the possibility of stretching debt repayment over a relatively longer period, as well as debt-financed investments aimed at ensuring a certain standard of living after retirement. Considering the above, we assume that:

H3: Life expectancy at birth is positively associated with household indebtedness.

1.6. Factors determining the supply of credit to households

The supply of credit to households is positively correlated with financial development, which indicates the level of competition of the financial sector (Abd Samad et al., 2020; Aziz et al., 2024). Romão and Barradas (2024) conclude that a process of financialisation that is associated with financial development contributes to the growth of households' indebtedness. The multiplicity of lending institutions and intensifying competition among them leads to looser requirements being placed on borrowers, which contributes to the growth of debt. A similar effect is produced by the relaxing of regulatory standards (Abd Samad et al., 2023) and banking supervision frameworks Borowski et al. (2017). Credit volumes are relatively lower in countries with supervision integrated into the central bank. This means that the political independence of the supervisory authority restricts access to consumer credit. The degree of competition is impacted by concentration, which indirectly affects the supply of credit to households, as (Borowski et al., 2017). Based on the above findings, we assume that:

H4: Bank policies that tighten lending standards reduce household debt, while greater credit availability encourages borrowing.

1.7. COVID-19 and household indebtedness

Household demand for debt is procyclical and subject to macroeconomic trends (Borowski et al., 2017). Nofsinger (2012), by examining household behaviour before, during, and immediately after the subprime crisis, argues that this demand exacerbates the boom/bust economic cycle. In boom times, households increase indebtedness and decrease savings, while in bust times, households repay debt and save more, which drags on an already sluggish economy. Taylor and McNabb (2007) provide evidence of the procyclicality of consumer confidence and its role in predicting downturns. Debt depends not only on life cycles and business cycles, but it is also shaped (through changes in consumer confidence) by pandemic threats and the geopolitical situation. Teresiene et al. (2021) show that the COVID-19 pandemic did not affect the consumer confidence index in the Eurozone, whereas in the United States and China, the impact was negative. At the same time, Guo et al. (2022) document increased household borrowing behaviours during COVID-19, while Yue et al. (2020) suggest the opposite trend. Based on a survey among Polish citizens during the COVID-19 pandemic, Kurowski and Malinowska-Misiąg (2024) conclude that financial literacy significantly

increases households' borrowing intentions. Since data horizon is too short to assess the impact of geopolitical phenomena, we test only the hypothesis relating to the impact of COVID-19:

H5: COVID-19 decreases household borrowing.

1.8. The impact of macroeconomic variables on household debt

As mentioned, macroeconomic variables affect both demand and supply of household debt. The effect of interest rates on debt levels is not clear-cut. While Aziz et al. (2024) and Dumitrescu et al. (2022) demonstrate the positive effect of interest rates for household debt, Abd Samad et al. (2023) and Moore and Stockhammer (2018) suggest the opposite effect. Emiris and Koulischer (2023) document that less constrained and wealthier households increase their borrowing most when interest rates fall, while Rubaszek and Serwa (2014) show that the household credit to GDP ratio depends on the lending-deposit interest rate spread. Interest rates are most often a function of inflation, with increases resulting in suppressed household indebtedness, as shown by Aziz et al. (2024), Dumitrescu et al. (2022), Abd Samad et al. (2020), and Coletta et al. (2019).

Among the variables identified in empirical studies as affecting household indebtedness, unemployment and housing prices are relatively frequently mentioned. Unemployment is associated with a decline in satisfactory creditworthiness and is usually compounded by reduced disposable income. For this reason, it leads to lower household debt (Abd Samad et al., 2020; Aziz et al., 2024; Coletta et al., 2019; Dumitrescu et al., 2022). In turn, the rise of residential property prices results in growth of household debt (Abd Samad et al., 2020; Aziz et al., 2024; Coletta et al., 2019; Dumitrescu et al., 2022; Moore & Stockhammer, 2018; Romão & Barradas, 2024; Stockhammer & Wildauer, 2017). This is due to the need to take on increasing amounts of debt to buy a home, allocate more to debt servicing, and supplement current income with consumer loans. Marire (2024) proves that the coexistence of a 'house price boom' and the 'low policy rate' explains the substantial increase in household leverage.

The impact of residential property prices on household debt is also distorted by different models of residential property use in individual countries in terms of share of owned and rented flats (Augustyniak et al., 2013), differences in national housing policies based on support for long-term rentals or mortgage subsidies (Podlińska & Bogusz, 2025), as well as varying degrees of quantita-

tive restrictions on mortgage markets (Eerola et al., 2022), and the growing influence of institutional investors on housing prices (Banti & Phylaktis, 2025).

Both Coletta et al. (2019) and Borowski et al. (2017) point to a positive impact of economic growth on household debt, while Moore and Stockhammer (2018) conclude that growth leads to a reduction in household debt. Dumitrescu et al.'s study (2022) used a sample comprising 26 OECD countries for the period of 2002q1–2020q4, and demonstrates how economic growth leads to lower household debt, although this effect decreases as the level of household debt increases.

Despite the ambiguous effect of GDP on household indebtedness, the strong consensus that consumer confidence is positively associated with household indebtedness leads us to test the hypothesis:

H6: The impact of the consumer confidence index on household borrowing is more pronounced in countries with higher GDP per capita growth.

2. Data and methodology

This study investigates the determinants of household debt using a dataset of 36 countries worldwide from 2012 to 2022. This period is crucial for studying household borrowing because it encompasses significant economic shifts, including post-2008 crisis recovery, the debt crisis across the Mediterranean countries, prolonged low interest rates, housing market changes, and technological advancements in financial services. The decade in question also saw growing income inequality, major policy interventions, and the disruptive effects of the COVID-19 pandemic, followed by a surge in inflation and interest rate hikes. These events provide a unique context for understanding how households respond to economic cycles, financial innovations, and regulatory changes, offering valuable insights into borrowing behaviour and financial stability.

Table 1 summarises the composition of the research sample and reports country-level averages for three key variables: household debt as a share of net disposable income (DEBTH), gross domestic savings to GDP (DOMSAVINGS), and labour force participation (LABOURFORCE). The sample displays substantial cross-country heterogeneity in household indebtedness. Debt levels are particularly high in several advanced economies, most notably Denmark (262%) and the Netherlands (261%), followed by Norway (235%), Switzerland (216%), and Australia (206%), while markedly lower values are observed in emerging economies such as Mexico (22%), Russia (31%), Colombia (46%), and Brazil (48%).

Table 1. Descriptive statistics by country (averages for 2012–2022)

Countries	Debth	Domsavings	Labourforce
Australia	206.3	26.26	67.47
Austria	91.46	27.91	56.38
Belgium	112.87	25.09	29.96
Brazil	48.95	17.37	55.46
Canada	182.09	22.52	64.86
Chile	69.6	24.38	33.53
Colombia	46.76	15.51	48.90
Czechia	70.7	32.96	30.30
Denmark	262.48	28.98	60.03
Estonia	81.12	29.67	42.16
Finland	138.49	22.89	52.52
France	123.35	22.29	35.50
Germany	96.21	27.36	50.77
Greece	109.94	10.17	24.67
Hungary	48.32	29.74	30.39
Ireland	171.53	53.75	48.50
Italy	88.16	20.95	26.22
Japan	114.23	24.29	45.58
Korea	168.75	35.05	27.12
Latvia	47.15	21.39	38.02
Lithuania	50.79	22.24	34.75
Luxembourg	177.61	50.63	31.58
Mexico	22.91	19.59	44.64
Netherlands	261.9	30.79	70.84
New Zealand	117.65	23.12	62.34
Norway	235.95	36.64	56.68
Poland	58.54	23.04	33.45
Portugal	130.66	17.45	33.43
Russia	31.01	30.28	35.53
Slovak Republic	73.9	24.15	30.30
Slovenia	56.29	27.1	35.09
Spain	113.66	22.41	34.00
Sweden	183.06	28.8	54.48
Switzerland	216.04	36.32	67.24
United Kingdom	151.53	16.65	55.93
United States	109.66	18.12	55.15

Source: own elaboration.

Savings rates also vary widely, ranging from relatively low levels in countries such as Greece (10.1%) to very high levels in Ireland (53.7%) and Luxembourg (50.6%), suggesting differences in domestic funding capacity and household balance-sheet behaviour. Labour force participation is highest in the Netherlands (70.8%), Australia (67.4%), and Switzerland (67.2%), whereas it is notably lower in several European countries (e.g., Italy 26.2%, Belgium 29.9%). Overall, Table 1 highlights strong between-country variation in the outcome variable (DEBTH) and in potential explanatory factors, providing a useful backdrop for the subsequent empirical analysis of the determinants of household indebtedness. Table 2 with descriptive statistics shows substantial heterogeneity in the panel. Household indebtedness (DEBTH) varies widely, indicating that some country-year observations are highly leveraged relative to disposable income. By contrast, consumer sentiment (CCI) is tightly clustered around its mean, suggesting relatively limited variation in confidence over the sample. Bank solvency conditions, proxied by BANKCAP, implies meaningful differences in capitalisation across banking systems. CREDIT displays one of the widest ranges, consistent with large differences in financial depth and private-sector leverage across countries. Within this, domestic credit to the private sector is included as a macro-financial control capturing the overall depth of financial intermediation and credit availability in the economy. Although household debt constitutes one component of private-sector credit, the variable is broader in scope, as it also includes credit extended to firms and other private-sector entities. Its inclusion therefore allows us to control for the general credit environment in which household indebtedness evolves. Domestic savings (DOMSAVINGS) also show notable dispersion, pointing to heterogeneity in domestic funding capacity. LABOURFORCE varies considerably, while LIFEEXPECTANCY is comparatively stable but still heterogeneous across countries.

Table 2. Descriptive statistics

Variable	Observations	Mean	Standard deviation	Min	Max
DEBTH	396	4.63	0.6	2.92	5.69
CCI	362	4.6	0.02	4.51	4.65
BANKCAP	351	7.45	2.09	4	15.05
CREDIT	365	94.73	44.86	24.93	221.13
DOMSAVINGS	384	26.35	8.89	6.72	64.1
LABOURFORCE	384	44.38	13.6	20.72	81.76
LIFEEXPECTANCY	384	79.94	3.16	69.75	84.56
GDPGROWTH	384	2	3.3	-11.17	24.48

Source: own elaboration.

Table 3 reports pairwise correlations (with p-values in parentheses) between household indebtedness and the main explanatory variables. DEBTH is strongly and positively correlated with CREDIT (0.66) and LIFEEXPECTANCY (0.67), and also shows a sizeable positive association with LABOURFORCE (0.57). These patterns suggest that higher household debt tends to coincide with deeper credit markets, stronger labour market participation, and higher levels of socioeconomic development, as measured by life expectancy. DEBTH is also moderately positively correlated with DOMSAVINGS (0.36), indicating that more indebted economies in the sample are not necessarily low-saving economies, consistent with cross-country heterogeneity in financial structures and balance sheets.

Table 3. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) DEBTH	1.000							
(2) CCI	−0.016 (0.766)	1.000						
(3) BANKCAP	−0.485 (0.000)	0.194 (0.000)	1.000					
(4) CREDIT	0.659 (0.000)	−0.100 (0.035)	−0.501 (0.000)	1.000				
(5) DOMSAVINGS	0.362 (0.000)	0.191 (0.000)	0.142 (0.003)	0.005 (0.918)	1.000			
(6) LABOURFORCE	0.570 (0.000)	0.035 (0.464)	−0.183 (0.000)	0.375 (0.000)	0.093 (0.047)	1.000		
(7) LIFEEXPECTANCY	0.669 (0.000)	0.000 (0.994)	−0.414 (0.000)	0.424 (0.000)	0.139 (0.002)	0.315 (0.000)	1.000	
(8) GDPGROWTH	0.006 (0.908)	0.307 (0.000)	0.232 (0.000)	−0.171 (0.000)	0.323 (0.000)	0.044 (0.346)	−0.108 (0.019)	1.000

Notes: *p*-values in parentheses.

Source: own elaboration.

Based on the review of the theory and previous empirical evidence (Abd Samad et al., 2020; Dumitrescu et al., 2022), we estimate a dynamic specification to account for the strong persistence observed in household indebtedness. The baseline model is as Equation (1):

$$DEBTH_{i,t} = \beta_0 DEBTH_{i,t-1} + \beta' X_{i,t} + \delta_2 COVID_t + \lambda_i t + \varepsilon_{i,t} \quad (1)$$

where $DEBTH_{i,t}$ denotes household debt as a percentage of household and NPISH net disposable income in country i and year t . $DEBTH_{i,t-1}$ is the lagged dependent variable, included to capture the persistence of household indebtedness. $X_{i,t}$ is a vector of control variables, including CCI, BANKCAP, CREDIT, DOMSAVINGS, LABOURFORCE, LIFEEXPECTANCY, and GDPGROWTH. Accordingly, β denotes the vector of coefficients associated with these control variables. $COVID_t$ is a dummy variable equal to 1 for the pandemic period and 0 otherwise. In the baseline specification, the COVID-related dummy equals 1 for 2019–2022 and 0 otherwise. We use this broader window not to suggest that the pandemic started in 2019 in economic terms, but to capture the full pandemic-related disturbance period, including the pre-pandemic year immediately preceding the shock and the subsequent years of economic disruption. The year 2019 is therefore treated as part of the transition window rather than as a pandemic year per se. This broader definition allows us to account for anticipatory changes, early uncertainty, and adjustment processes in household indebtedness around the COVID-19 shock. λ_i denotes country fixed effects, which control for unobserved time-invariant country-specific heterogeneity, while $\varepsilon_{i,t}$ is the idiosyncratic error term. The definitions, calculation methods and data sources for all variables used in the empirical analysis are summarised in the Appendix. To account for the dynamic nature of household indebtedness and potential endogeneity concerns, we employ dynamic panel Generalised Method of Moments (GMM) estimators following Arellano and Bond (1991) and the system-GMM extensions developed by Arellano and Bover (1995) and Blundell and Bond (1998). In this framework, the model is estimated using internally generated instruments: lagged levels of endogenous (or pre-determined) variables serve as instruments for the equation in first differences, and lagged first differences serve as instruments for the equation in levels (system GMM). This approach mitigates endogeneity, controls for unobserved heterogeneity, and improves efficiency when variables are persistent. Robust (heteroskedasticity-consistent) standard errors are reported.

Instrument validity and model diagnostics are assessed using standard GMM post-estimation tests. The Hansen test of overidentifying restrictions evaluates the joint validity of the instrument set; failure to reject the null supports instrument exogeneity (as reflected by the reported p-values). We also report the Arellano–Bond tests for serial correlation in the differenced residuals. As expected in dynamic differenced models, AR(1) is typically present, while the key requirement for consistency is the absence of a second-order serial correlation. Accordingly, the AR(2) test results (insignificant p-values) support the assumption of no second-order autocorrelation in the differenced errors, implying no serial correlation in the level error term and hence consistent GMM estimates.

3. Results

Our study analyses the determinants of household indebtedness by examining the factors that influence it through both supply-side and demand-side channels. To provide a deeper and more nuanced understanding, we further refine the analysis by categorising these determinants into distinct groups, thereby shedding light on the various forces shaping household debt. Table 4 presents four nested specifications. Column (1) includes persistence (lagged DEBTH) and CCI. Column (2) adds banking- and macro-variables (BANKCAP, CREDIT, DOMSAVINGS). Column (3) further augments the model with labour market participation and demographic development (LABOURFORCE, LIFEEXPECTANCY). Column (4) introduces the COVID dummy to capture the pandemic-period shift in household debt dynamics. The validity of the dynamic system GMM estimations is assessed using standard post-estimation diagnostic tests. Firstly, the Arellano–Bond tests indicate statistically significant first-order serial correlation in the differenced residuals (AR(1)), which is expected in dynamic panel models after first-differencing. Importantly, the test for second-order serial correlation (AR(2)) is insignificant across all specifications, supporting the use of lagged levels as valid instruments. Secondly, the Hansen test of over-identifying restrictions does not reject the null hypothesis of instrument validity in any specification, suggesting that the instrument set is jointly exogenous. Overall, these diagnostics support the consistency of the estimators and the appropriateness of the chosen instrument set.

First, lagged household debt strongly impacts the current level of household debt. The lagged coefficients range between 0.8 and 0.9, and are statistically significant at the 1% level, confirming the strong persistence of the household debt and the inherent difficulties in reducing it rapidly. The Consumer Confidence Index also positively influences household debt across all samples. The result confirms observations from previous literature (e.g., Gric et al., 2022; Kłopocka, 2017) and our first hypothesis (H1), suggesting that when consumers feel optimistic about the economy, they are more likely to take on debt, possibly to finance consumption or investments.

A higher bank capital-to-asset ratio is associated with lower household debt levels. In contrast, a higher level of domestic credit to the private sector as a percentage of GDP generally means higher household debt, thus confirming our fourth hypothesis (H4), that bank policies that tighten lending standards reduce household debt while greater credit availability encourages borrowing. Higher bank capital ratios typically signal lower credit availability, and often reflect restrictive regulatory or supervisory policies that limit debt. These findings align with those obtained by Abd Samad et al. (2023) and Borowski et al. (2017). On the other hand, domestic credit to the private sector indicates the overall availability of credit in the economy, which can facilitate household borrowing.

Table 4. Regression results of determinants of household debt

Variables	(1) Debth	(2) Debth	(3) Debth	(4) Debth
DEBTH (−1)	0.917*** (0.002)	0.850*** (0.003)	0.815*** (0.010)	0.792*** (0.015)
CCI	0.063*** (0.002)	0.104*** (0.003)	0.031*** (0.008)	0.012 (0.011)
BANKCAP		−0.004*** (0.001)	−0.005*** (0.001)	−0.006*** (0.001)
CREDIT		0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
DOMSAVINGS		0.001*** (0.000)	0.001 (0.001)	0.001 (0.001)
LABOURFORCE			0.000 (0.000)	−0.000 (0.000)
LIFEEXPECTANCY			0.006*** (0.001)	0.009*** (0.001)
GDPGROWTH				0.000 (0.000)
COVID				−0.005*** (0.001)
Observations	327	327	327	327
Number of countries	36	36	36	36
Hansen statistic	33.40	30.62	26.90	23.73
<i>p</i> -value	0.638	0.634	0.723	0.784
AR test statistic	−2.416	−2.231	−2.172	−2.086
<i>p</i> -value	0.0157	0.0257	0.0299	0.0370
AR(2) test statistic	−1.176	−1.150	−1.199	−1.360
<i>p</i> -value	0.240	0.250	0.230	0.174

Note: Standard errors are in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: own elaboration.

Higher gross domestic savings affect household debt positively. This suggests that higher credit availability and lower vulnerability to economic shocks that stem from higher savings in the economy are important determinants of household indebtedness. Regarding demographics, the labour force participation rate does not influence household debt significantly, whereas

longer life expectancy is statistically significantly associated with higher debt. Consequently, while we do not find confirmation for our second hypothesis (H2), the third hypothesis—relating to life expectancy at birth positively contributing to household indebtedness—is confirmed. The absence of a significant effect of the labour force participation rate suggests that the size of the active labour force alone does not necessarily translate into higher household borrowing. This aligns with studies indicating that labour-market expansion may be offset by factors such as income pressure, unemployment risk, or credit constraints (Dumitrescu et al., 2022; Meng et al., 2013). In contrast, the positive and statistically significant relationship between life expectancy and household debt supports the life-cycle perspective: longer expected lifetimes extend the potential repayment horizon, improve perceived creditworthiness, and encourage borrowing to smooth consumption and finance investments aimed at maintaining living standards in retirement.

Finally, the COVID-19 dummy is negative and statistically significant in equation (4), confirming our fifth hypothesis (H5). It seems that during the pandemic, crisis households actively prioritised reducing debt. This observation is consistent with the literature stating that debt tends to increase in boom periods and decrease in bust periods (e.g., Nofsinger, 2012).

The result indicating the negative impact of COVID-19 on household debt is also in line with explanations given by the behavioural dimension: capacity to decide, perception of value, and relations to others (Biddle, 2021). The pandemic affects the capacity to decide due to complexity and uncertainty that intensify loss aversion. Consequently, heightened risk aversion naturally deterred individuals from increasing debt. The pandemic also strengthened the influence of other consumers' behaviour and the perception of reality on consumer decisions, often at the expense of individualism and rationality in the decision-making process. Furthermore, fear of the pandemic caused a significant shift in consumer spending patterns towards increased consumption of necessities at the expense of non-necessities. The magnitude of this shift depended heavily on personality traits, perceived economic stability, and self-justifications for purchasing (Cannito et al., 2021; Di Crosta et al., 2021). Moreover, job insecurity and life uncertainty prevented consumers from purchasing goods whose value exceeds their current payment capabilities (Chirumbolo et al., 2021). Our results on a negative impact of COVID-19 on household debt are consistent with this trend, as debt is mainly used to finance non-necessities. This is corroborated by Nigatu et al. (2022), who indicate that during the pandemic, only 17.5% of respondents experienced an increase in debt, with a significant determinant of this increase being the deterioration in their mental health.

Table 5 reports dynamic system GMM estimates for two GDP-per-capita-growth sub-samples: Panel A includes observations with above-average GDP per capita growth, while Panel B includes observations with GDP per capita

Table 5. Household debt: high- vs. low-GDP-growth countries

	Panel A: High GPD per capita growth				Panel B: Low GPD per capita growth			
Variables	(1) Debth	(2) Debth	(3) Debth	(4) Debth	(1) Debth	(2) Debth	(3) Debth	(4) Debth
DEBTH (-1)	0.943*** (0.001)	0.871*** (0.006)	0.865*** (0.017)	0.840*** (0.024)	1.004*** (0.003)	0.921*** (0.009)	0.790*** (0.033)	0.804*** (0.033)
CCI	0.041*** (0.000)	0.119*** (0.005)	0.067*** (0.017)	0.056* (0.030)	0.010*** (0.002)	0.054*** (0.006)	-0.085*** (0.019)	-0.065 (0.045)
BANKCAP		-0.015*** (0.001)	-0.011*** (0.002)	-0.017*** (0.002)		-0.008*** (0.001)	-0.001 (0.001)	-0.001 (0.001)
CREDIT		0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)		0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
DOMSAVINGS		0.002*** (0.000)	0.001 (0.001)	0.001* (0.001)		0.001** (0.000)	0.002 (0.001)	0.002 (0.002)
LABOURFORCE			-0.003** (0.001)	-0.003 (0.002)			-0.003*** (0.001)	-0.002*** (0.001)
LIFEEXPECTANCY			0.005*** (0.001)	0.008** (0.004)			0.015*** (0.002)	0.012*** (0.004)

	Panel A: High GPD per capita growth				Panel B: Low GPD per capita growth			
Variables	(1) Debth	(2) Debth	(3) Debth	(4) Debth	(1) Debth	(2) Debth	(3) Debth	(4) Debth
GDPGROWTH				−0.000 (0.000)				−0.000 (0.000)
COVID				−0.011*** (0.003)				−0.008*** (0.001)
Observations	133	127	127	127	194	175	175	175
Number of countries	33	33	33	33	33	33	33	33
Hansen statistic	31.73	24.30	25.51	19.91	33.31	27.03	25.33	23.93
<i>p</i> -value	0.579	0.798	0.651	0.834	0.501	0.670	0.661	0.634
AR test statistic	−1.748	−1.619	−1.732	−1.769	−1.447	−1.287	−1.281	−1.288
<i>p</i> -value	0.0805	0.105	0.0834	0.0769	0.148	0.198	0.200	0.198
AR(2) test statistic	0.769	0.482	0.623	0.587	−1.496	−1.566	−1.537	−1.559
<i>p</i> -value	0.442	0.630	0.533	0.557	0.135	0.117	0.124	0.119

Note: Standard errors are in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: own elaboration.

growth at or below the sample average. Within each panel, columns (1)–(4) present progressively augmented specifications: column (1) includes the lagged dependent variable and CCI; column (2) adds BANKCAP, CREDIT, and DOMSAVINGS; column (3) further adds LABOURFORCE and LIFEEXPECTANCY; and column (4) additionally controls for the COVID dummy. Diagnostic tests support the validity of the GMM specifications. The Hansen test does not reject the hypothesis of instrument validity in any model, and the AR(2) test is consistently insignificant, indicating no evidence of second-order serial correlation in the differenced residuals.

In all cases, debt exhibits strong persistence. The consumer confidence index has a positive impact on household debt in most models, but its strength differs markedly between the subsamples. Consumer confidence affects debt more in countries with higher GDP per capita growth, confirming our hypothesis H6. Given the positive impact of GDP growth on household debt found in some studies (e.g., Coletta et al., 2019; Borowski et al., 2017) and results that consumer confidence is positively associated with household indebtedness, CCI might affect the debt more when GDP grows faster. GDP growth fuels consumer confidence in an optimistic outlook, which might strengthen the positive impact of confidence on debt.

Furthermore, in low-growth countries, the CCI coefficient turns negative in models (3) and (4), where labour force participation and life expectancy are added. This change should be interpreted with caution, as the additional controls may absorb some of the macroeconomic and life-cycle channels previously captured by consumer confidence. In particular, consumer confidence is likely to be correlated with labour-market conditions, income security, and demographic structure. In a low-growth environment, this residual confidence effect does not necessarily translate into higher borrowing; instead, households may remain cautious, face income constraints, or prefer balance-sheet adjustment despite improved sentiment. Thus, the negative coefficient may indicate that the positive debt-enhancing effect of confidence operates mainly through labour-market and demographic channels, rather than through consumer sentiment alone.

In both panels, GDPGROWTH is close to zero and statistically insignificant in model (4). This result may indicate that household debt dynamics are driven more strongly by structural financial conditions and the stock-adjustment process than by contemporaneous GDP growth. The finding is consistent across both high- and low-growth country groups, suggesting that the direct effect of current macroeconomic growth on household indebtedness is limited in the dynamic specification.

4. Robustness check

In the last step, we conduct robustness checks to verify whether the base-line findings are stable when the model is estimated using alternative specifications and estimation techniques. This helps mitigate concerns that the main results are driven by a particular estimator, instrument choice, or func-

Table 6. Robustness check: system GMM with time fixed effects

Variables	(1) Debth	(2) Debth
DEBTH (-1)	0.866*** (0.015)	0.772*** (0.028)
CCI	0.408* (0.246)	0.785** (0.328)
BANKCAP	-0.012*** (0.003)	-0.013*** (0.003)
CREDIT	0.001*** (0.000)	0.001*** (0.000)
DOMSAVINGS	0.003*** (0.001)	0.003*** (0.001)
LABOURFORCE		0.003*** (0.001)
LIFEEXPECTANCY		0.018*** (0.003)
Time Fixed Effects	YES	YES
Observations	302	302
Number of countries	33	33
Hansen statistic	15.33	16.28
<i>p</i> -value	0.999	0.754
AR test statistic	-2.311	-2.267
<i>p</i> -value	0.0208	0.0234
AR(2) test statistic	-1.295	-1.471
<i>p</i> -value	0.195	0.141

Note: Standard errors are in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: own elaboration.

tional form, and increases confidence in the inferred relationships between the determinants and household debt. The robustness checks in Tables 6 and 7 provide additional validation for the baseline findings by assessing alternative specifications and estimators while controlling for time fixed effects. Table 6 re-estimates the dynamic model using system GMM with year fixed effects. Table 7 complements this approach by estimating a conventional panel fixed-effects model with year fixed effects.

The results broadly confirm the observations made in the previous section. Household debt is highly persistent, consumer confidence is positively related with debt levels. Bank capitalisation lowers debt (though the relationship is not statistically significant in the case of fixed-effects model in Table 7), whereas domestic credit to private sector is positively associated with household debt. Gross domestic savings to GDP exhibit a positive correlation in Table 6 but become negative in Table 7. Longer life expectancy increases debt and an increase in the labour force participation rate also becomes positive when time fixed effects are included in GMM estimation.

Table 7. Robustness check: two-way panel fixed effects model

Variables	(1) Debth	(2) Debth
CCI	0.840*** (0.261)	0.935*** (0.260)
BANKCAP	-0.002 (0.004)	-0.003 (0.004)
CREDIT	0.006*** (0.000)	0.006*** (0.000)
DOMSAVINGS	-0.006** (0.002)	-0.004* (0.002)
LABOURFORCE		-0.006*** (0.002)
LIFEEXPECTANCY		0.005 (0.008)
Time Fixed Effects	YES	YES
Observations	332	332
Number of countries	33	33
R-squared	0.522	0.536
F-statistic	22.27	20.42

Note: Standard errors are in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: own elaboration.

Conclusions

This article studies the determinants of household indebtedness in 36 countries worldwide over the period 2012–2022, with a focus on the role of consumer confidence. We examine the overall relationship and pay special attention to the impact of the COVID-19 pandemic and consumption-oriented demographic variables in shaping the link between consumer confidence and household debt. For the analysis, we employ dynamic panel regression models using GMM estimators, and we additionally conduct robustness checks using alternative model specifications and estimators, including fixed-effects panel regressions with time effects, to confirm that the main findings are not driven by a particular empirical approach.

Our results provide novel evidence on the determinants of household indebtedness. Consumer confidence positively influences household debt, suggesting that an optimistic outlook on the economy makes households more likely to take on debt, for instance, to finance consumption or investments. At the same time, the COVID-19 pandemic lowered the debt levels in line with the literature claiming that debt decreases during significant downturns (e.g., Nofsinger, 2012).

The positive impact of consumer confidence on household indebtedness is also confirmed in regressions where we divide countries based on GDP per capita growth rate. This impact is stronger in countries with higher GDP per capita growth. The findings highlight the contextual nature of the consumer confidence-household indebtedness relationship, emphasising the importance of macroeconomic factors such as growth in shaping borrowing behaviour. Consequently, these insights can inform policymakers seeking to balance economic growth and financial stability, as the drivers and effects of consumer confidence on debt accumulation vary across different economic contexts.

Household debt is highly persistent, with past debt levels significantly influencing present levels. The high degree of persistence indicates that past borrowing strongly influences current debt levels, reflecting the long-term nature of financial commitments. Continuous monitoring of debt level trends is essential to safeguard financial stability and ensure resilience in the post-pandemic recovery period.

Household indebtedness is also affected by sectoral, macroeconomic and demographic variables. Expanded domestic credit to the private sector as a percentage of GDP drives household debt upwards, while a higher bank capital-to-asset ratio lowers household debt levels. Higher domestic savings, indicating higher credit availability are also key determinant of household indebtedness. The results for labour force participation are less robust and should therefore be interpreted with caution, as the coefficient is not statistically significant in the main model. By contrast, life expectancy at birth

is more consistently associated with higher household indebtedness, which suggests that demographic and life-cycle factors may play a role in shaping household borrowing.

The empirical results provide a few important implications. Firstly, consumer confidence may serve as an important predictor of household borrowing behaviour alongside economic fundamentals and thus should be considered by policymakers for forecasting indebtedness and predicting policy effects.

Secondly, the persistence of household indebtedness indicates that debt is difficult to reduce in a short period of time and thus policymakers should carry out prudent policies, closely monitoring the situation and intervening early when signs of rapid deterioration appear. However, this task might be complicated by unpredictable events such as the COVID-19 pandemic, which cause sudden changes in debt levels. Such a possibility reinforces the imperative for prudent policies in 'normal' times.

This study has several limitations. Firstly, the analysis focuses on a dataset of 36 countries, which, despite its breadth, may not fully capture the diverse economic, cultural, and institutional factors influencing household debt in other regions. Secondly, the study primarily examines aggregate household debt, which may obscure heterogeneity across income groups, age cohorts, or other demographic factors. Thirdly, while the dataset accounts for major global events like the COVID-19 pandemic and inflation surges, it may not adequately capture country-specific shocks or policy responses. Lastly, data constraints may affect the precision and completeness of the analysis, particularly regarding informal borrowing and unregulated financial activities. These limitations highlight the need for further research to validate and extend the findings across broader contexts and datasets.

Possible future studies could include expanding the possible determinants of household indebtedness to include ones related to implementing new technologies in lending. Furthermore, detailed research on the channels through which the COVID-19 pandemic affected how consumer confidence and some macroeconomic variables impact on household debt would bring more insight into debt dynamics, and in turn, might help in policy preparation for future crises.

Appendix

Variables and data sources

Variable abbreviation	Variable name	Definition	Role in the model	Data source
DEBTH	Household debt	Household debt expressed as a percentage of household and non-profit institutions serving households (NPISH) net disposable income.	Dependent variable	OECD
CCI	Consumer Confidence Index	Index measuring consumers' expectations and perceptions regarding the general economic situation, household financial conditions, unemployment, and savings capacity.	Control variable	OECD
BANKCAP	Bank capital to assets ratio	Ratio of bank capital to total bank assets.	Control variable	World Bank Global Financial Development Database
CREDIT	Domestic credit to private sector	Domestic credit provided to the private sector, expressed as a percentage of GDP.	Control variable	World Bank World Development Indicators
DOMSAVINGS	Gross domestic savings	A share of national income not used for final consumption expenditure as percentage of GDP.	Control variable	World Bank World Development Indicators
LABOUR-FORCE	Labour force participation rate	The percentage of economically active population in the total population aged 15 and above.	Control variable	World Bank World Development Indicators
LIFE-EXPECTANCY	Life expectancy at birth	Average number of years a newborn is expected to live.	Control variable	World Bank World Development Indicators
GDPGROWTH	GDP growth	Annual percentage growth rate of gross domestic product.	Control variable	World Bank World Development Indicators
COVID	Pandemic-related adjustment window	Dummy variable equal to 1 for the years 2019–2022 and 0 otherwise.	Period dummy	Authors' construction

Source: own elaboration.

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