ISSN 2669-2481 / eISSN 2669-249X

VILNIUS TECH
Vilnius Gediminas Technical University

BUSINESS, MANAGEMENT AND ECONOMICS ENGINEERING

2026
Volume 24
Issue 2
Pages 242–254

https://doi.org/10.3846/bmee.2026.25198

MACROECONOMIC DETERMINANTS OF PRIVATE CREDIT IN EU MEMBER STATES: EVIDENCE FROM A 27-COUNTRY PANEL

Simona DAUGĖLAITĖ, Lina GARŠVIENĖ, Kristina MATUZEVIČIŪTĖ ✉, Dovilė RUPLIENĖ

Institute of Regional Development, Šiauliai Academy, Vilnius University, Šiauliai, Lithuania

Article History:
- received 31 October 2025
- accepted 26 February 2026

Abstract. *Purpose* – This study examines the macroeconomic determinants of private credit in European Union (EU) member states, focusing on interest rates, inflation, unemployment, household income and expenditure, and housing prices. It aims to identify key drivers of household borrowing and assess how macroeconomic conditions shape credit dynamics across the EU.

Research methodology – The analysis covers 27 EU countries over the period 2001–2023 and applies panel-data econometric techniques, including ordinary least squares, fixed-effects, and random-effects models, to examine linear and nonlinear relationships.

Findings – The results show that interest rates exert the strongest negative effect on private credit volumes. The gap between household expenditure and income is positively and significantly associated with household debt, indicating increased reliance on borrowing when consumption growth outpaces income growth. By contrast, housing prices, unemployment, and the nonlinear effects of the expenditure-income gap are not statistically significant.

Research limitations – Data availability limits the scope of cross-country comparison.

Practical implications – Policymakers should prioritise interest rate management, income growth, and labour market stability to support sustainable household indebtedness.

Originality/Value – The study complements existing research by incorporating the expenditure-income gap as an additional perspective on household borrowing in the EU.

Keywords: private credit, inflation, housing prices, interest rates, European Union.

JEL Classification: E51, G21, G51, C23.

✉Corresponding author. E-mail: *kristina.matuzeviciute-balciuniene@sa.vu.lt*

1. Introduction

Household indebtedness has been increasing in many countries worldwide. However, each country must establish a well-functioning financial system that supports and accelerates economic growth. Private credit is often used as a long-term tool to tackle social and economic issues, including poverty reduction. Nevertheless, concerns persist about whether households can meet their financial obligations sustainably and responsibly. This capacity depends on several factors, including the level of indebtedness, household income, expenditure, interest rates, and the specific terms of loan agreements. In recent years, housing, land, and other real estate asset prices have increased rapidly, leading to a growing number of households and firms borrowing. In 2024, the average private credit-to-GDP ratio across European Union countries was 43.85%. Northern and Western European countries, such as Denmark, Sweden, the Netherlands, and Germany, have historically maintained high levels of household indebtedness.

Copyright © 2026 The Author(s). Published by Vilnius Gediminas Technical University

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Household debt levels in the European Union have been rising rapidly, heightening the risk of insolvency. In recent periods, interest rates and housing prices, household expenditures, and other financial pressures have continued to rise. According to the Bank of Lithuania (Lietuvos bankas, 2024), overall trends indicate that demand for new loans, particularly for non-financial corporations and housing, has been consistently declining for more than a year, while demand for consumer and other types of loans has ceased to grow. Several authors, including Romão and Barradas (2020), Dumitrescu et al. (2022), Mohamed et al. (2020), and Abd Samad et al. (2020), among others, have examined the determinants of household debt, which include inflation, housing prices, investment levels, interest rates, unemployment, household expenditures, working-age population share, GDP, economic growth, wages, age structure, and credit supply.

However, there is a lack of comprehensive studies that specifically analyse household debt across EU member states, and a noticeable gap persists in methodological diversity in this area of research. Moreover, limited attention has been given to the determinants that significantly influence the volume of household loans. These factors are closely linked to the population's overall well-being and quality of life. Whether a borrower's average monthly income is sufficient to cover loan repayments depends on a range of economic factors, such as inflation, interest rates, and expenditure levels. Consequently, household borrowing behaviour is likely shaped by expectations of rising living costs, an increased financial burden from existing commitments, and persistent economic uncertainty.

This paper aims to evaluate the macroeconomic factors that influence private credit in EU member states. In order to achieve the objectives outlined above, the following hypotheses have been formulated: (1) rising interest rates are causing a decline in private credit; (2) rising unemployment reduces private credit; (3) inflation growth reduces private loans; (4) a wider gap between household expenditure and income growth increases household indebtedness to cover this deficit; (5) the rise in housing prices is driving the growth in household loans.

2. Literature review: macroeconomic determinants of private credit

The rapid increase in household debt raises significant concerns for national policymakers, as household debt continues to rise. The dynamics of household credit have attracted considerable scholarly attention in recent years, particularly following the global financial crisis of 2008–09, which highlighted the potential risks associated with excessive borrowing (Abd Samad et al., 2020). The analysis of previous research reveals various factors that determine household debt. On the demand side, most economists have identified macroeconomic factors that determine changes in household debt, including inflation, interest rates, the unemployment rate, income, per capita spending and house prices.

Inflation is a crucial economic factor that affects household borrowing in both direct and indirect ways. High inflation can erode the real value of existing debt, potentially encouraging borrowing based on expectations of future inflation. However, it often leads to higher nominal interest rates and economic uncertainty. This situation can reduce loan demand and make banks less willing to offer household loans (Coletta et al., 2019). Recent quantitative studies predominantly find a negative relationship between inflation and household debt. Dumitrescu

et al. (2022) report that higher inflation reduces household borrowing in a panel of 26 OECD countries. The authors indicate that inflation is relevant for household debt when debt levels are high. The negative relationship indicates that the supply-side effect, in which lenders restrict credit as inflation erodes the value of loans, outweighs the opposing demand-side effect of a reduced real debt burden, especially for highly indebted households. Similarly, Abd Samad et al. (2020) find a significant negative impact of inflation on household debt in emerging economies due to decreasing financial constraints on households. Several studies report conflicting results regarding the impact of inflation on household debt, i.e., Nomatye and Phiri (2017), Mohamed et al. (2020) found that the relationship between household debt and inflation in South Africa is positive but statistically insignificant, suggesting that inflation did not have a meaningful impact on household debt levels during the period studied.

Although interest rates on new loans for both households and businesses began to stabilise following a period of rapid growth, this trend further stimulated the expansion of debt markets across both the public and household sectors. According to Dumitrescu et al. (2022), a growing demand for housing loans can lead to crowding out, potentially driving up interest rates. This suggests that higher borrowing costs do not always deter households from obtaining loans, unless their household debt levels are already significantly high; in such cases, a negative relationship may emerge. The interest rate is determined by several factors, including the borrower's creditworthiness, financial situation, and solvency; the loan amount; macroeconomic conditions in the country; the repayment term; and other contractual conditions. As noted by Garšvienė et al. (2022), higher interest rates are associated with a lower willingness to borrow, whereas lower interest rates tend to increase borrowing intentions. Moore and Stockhammer (2018) also find that lower interest rates are associated with higher household debt levels. Cheaper borrowing costs encourage households to take on more loans, especially mortgages. However, the strength of this effect depends on other factors, such as credit availability, income growth, and housing market conditions. Similarly, the findings of Romão and Barradas (2020) confirm that, as expected, the correlation between financial asset prices and household indebtedness is positive, while the correlations between household labour income and indebtedness, as well as between interest rates and household indebtedness, are negative. In a systematic literature review of country-level studies, Chikeya and Ntsalaze (2025) report that the majority found a significant negative effect of interest rates on household debt, i.e., Turinetti and Zhuang (2011), Khan et al. (2020), Nomatye and Phiri (2017), Enache (2022), Mamatzakis et al. (2023) and others. It is important to note that not all findings are ambiguous. Several studies have indicated positive correlations between interest rate, debt, and other variables, suggesting more complex dynamics. Abd Samad et al. (2020) discovered that household debt is positively associated with borrowing interest rates, housing prices and financial development. This could be explained by the strong demand for credit to finance consumption and asset investment, which makes households less sensitive to higher borrowing costs. Additionally, access to subprime credit for lower-credit households contributes to rising indebtedness despite higher interest rates. Similarly, Barradas and Tomás (2023) conducted a panel analysis of 28 EU countries from 1995 to 2019. They found that interest rates have a positive effect on household debt. This suggests that higher interest rates could raise household indebtedness in EU countries. Households might choose to borrow

now to take advantage of current rates, thus avoiding the risk of higher borrowing costs in the future if the upward trend continues. Nevertheless, such findings are the exception rather than the rule. The existing literature supports the conventional view that increases in borrowing costs reduce household debt. Conversely, low-interest regimes have been a factor for household credit booms. Interest rates are a macroeconomic factor consistently identified as a determinant of European household borrowing.

Labour market conditions significantly influence households' borrowing capacity and willingness to take out loans. A larger pool of individuals with stable incomes increases the likelihood of obtaining credit for significant long-term purchases, which generally require substantial financial resources and are typically made based on a household's discretion. The dynamics of unemployment influence borrowing behaviour in distinct ways. For instance, during periods of low unemployment, households may increase their indebtedness in response to rising expenses. Conversely, a high unemployment rate typically indicates lower income levels and greater financial constraints for households, hindering their ability to fulfil existing or new financial obligations. Empirical evidence finds that unemployment is negatively associated with household debt. Dumitrescu et al. (2022) argue that there is a negative relationship between unemployment and household debt, though this relationship weakens as debt levels increase. This negative correlation is intuitive and can be explained by the adverse effects of rising unemployment on household income and consumer confidence. An increase in unemployment reduces household borrowing capacity; however, the effect diminishes at higher levels of indebtedness. Similarly, Abd Samad et al. (2020) find that low unemployment is associated with higher income and stronger cash flows, which are expected to boost household expenditures and credit demand, as households possess greater purchasing power. Their ability to access loans improves due to stable income and a higher capacity to repay financial obligations. In their review of studies, Chikeya and Ntsalaze (2025) observe a significant negative correlation: higher unemployment is associated with lower household indebtedness. These results make intuitive sense: a rise in unemployment reduces many households' ability to borrow (due to income loss or fear of job loss) and may prompt financial institutions to become more risk-averse in consumer lending. Only a few studies find a positive or insignificant effect, and these disparities often reflect different time frames or countervailing influences. The prevailing explanation is that during periods of rising joblessness (often coinciding with recessions), households become more cautious and banks tighten credit supply, leading to a decline in new loans (Zhou & Niyitegeka, 2023). Garšvienė et al. (2022) suggest that unemployment and interest rates are not statistically significant in explaining private credit, or that their effects overlap with those of other significant variables in the model. A different perspective is presented by Mohamed et al. (2020), who report that only Gross Domestic Product (GDP) and the unemployment rate show a positive relationship with household credit in their analysis. These mixed findings highlight that the impact of unemployment on household debt can vary across economic contexts and modelling approaches.

The relationship between employment, household income, and consumption needs is significant. One perspective suggests that as incomes increase, households may finance more purchases directly, potentially decreasing their reliance on borrowing. Conversely, higher income may also enhance households' access to credit and increase their borrowing capacity,

potentially leading to a rise in debt. Additionally, when incomes stagnate but desired consumption remains high, households may turn to loans to bridge the gap between income and expenditures. Therefore, the impact of income on household debt has yielded nuanced findings. Many recent studies support the view that insufficient or declining income growth can spur greater borrowing, consistent with theories of consumption smoothing and credit as a substitute for earnings. For example, in a comprehensive panel study of EU countries, Barradas and Tomás (2023) found that a decline in household labour income significantly increased household indebtedness from 1995 to 2019. Their results show a negative coefficient for income, implying that lower (or slower-growing) household income is correlated with higher debt. They interpret this as evidence that households increased borrowing to compensate for eroding purchasing power. Strzelecka and Zawadzka (2020) noted that household income significantly influences creditworthiness and the ability to access loans in the formal credit market. When income falls below necessary expenditures in a given period, households seek alternative sources of financing. In such cases, they may rely on previously accumulated savings (if available) or take out a loan. According to Moore and Stockhammer (2018), younger individuals often do not earn sufficient income to support optimal lifetime consumption. Given access to credit, they are likely to borrow to smooth consumption over time. Consequently, households are more likely to accumulate debt in societies with a large share of young people who are not credit-constrained. A second common reason for borrowing is the presence of temporary income shocks. When short-term income unexpectedly declines, and households are not constrained by credit access, borrowing becomes a strategy to maintain stable consumption. Similarly, Garšvienė et al. (2022) observe that household and business incomes decrease during economic downturns, unemployment rises, corporate losses increase, bankruptcies become more frequent, and expectations for the future worsen. In line with these dynamics, Dumitrescu et al. (2022) argue that households tend to borrow during periods of lower income, such as recessions, and repay their debts during periods of higher income, such as during economic expansion.

Perhaps the housing market is the most influential determinant of household borrowing in advanced economies, particularly Europe. A large share of household debt is mortgages, making housing prices a critical factor. Rising home prices reflect and enable greater household debt: as property values climb, households borrow more to purchase homes. They can extract equity against higher collateral values, fuelling further credit expansion. Numerous scholars assert that housing booms contribute to household credit expansion. For example, as noted by Moore and Stockhammer (2018), the relationship between real housing prices and household indebtedness, as well as the interaction between debt and housing price cycles, are key areas for understanding household debt accumulation behaviour. Higher housing prices tend to lead to greater household borrowing, a trend that becomes more pronounced as household debt levels rise (Dumitrescu et al., 2022). Similarly, Garšvienė et al. (2022) find that rising housing prices significantly contribute to the expansion of private credit. In line with this, Abd Samad et al. (2020) emphasise that previous studies consistently demonstrate a strong association between rising household debt and rising housing prices, particularly in the context of low interest rates. Within the EU context, Barradas and Tomás (2023) underscore the pivotal role of housing prices. They find that surging house prices had a significant

positive impact on household indebtedness, and indeed that the rise in housing prices has been one of the primary triggers of the household debt build-up in Europe.

Recent literature highlights that household credit dynamics in the EU have been shaped by post-crisis institutional heterogeneity, macroprudential policy, and changing household balance sheets. Cross-country studies show that differences in mortgage markets, homeownership rates, and credit institutions lead to heterogeneous borrowing behaviour and asymmetric monetary policy transmission across EU member states (Christelis et al., 2021; Bouis, 2021; Hintermaier & Koeniger, 2024). At the same time, macroprudential measures have played an increasingly important role in restraining household credit growth and housing market pressures; however, depending on country-specific effects (De Schryder & Opitz, 2021; Coulier & De Schryder, 2024). Recent evidence also indicates that monetary tightening is mainly transmitted through tighter lending standards rather than through changes in lending rates, reinforcing cross-country differences in loan supply and demand factors (Gründler & Scharler, 2025). Importantly, post-pandemic research indicates increasing pressure on household finances, as during periods of high inflation, spending exceeded income growth, leading some households to rely on borrowing to maintain their consumption levels (O'Donoghue et al., 2025; Pulina, 2023; European Commission, 2023). These findings highlight the need to include the expenditure-income gap as a determinant of private credit in the EU.

3. Methodology

This study examines the 27 member states of the European Union (EU), an economically integrated area characterised by a common market and broadly harmonised financial and banking regulations. At the same time, EU countries exhibit substantial institutional heterogeneity, including differences between euro area and non-euro area members, mortgage market structures, macroprudential regimes, and national fiscal frameworks. These cross-country differences shape household income dynamics, credit conditions, and borrowing behaviour. While the empirical analysis employs an aggregate panel framework to identify common macroeconomic drivers of private credit, the EU provides a particularly relevant setting in which shared institutional foundations coexist with meaningful national variation, allowing for the examination of average relationships across diverse credit environments.

The research period covers 23 years, from 2001 to 2023. This timeframe encompasses significant developments, such as the 2004 EU enlargement, which included the accession of 10 new member states, as well as periods of steady economic growth and downturns (including the Great Recession and public debt crises in several EU countries). The length of the period allows for a substantial number of observations, enabling the identification of general trends. A review of previous studies on household lending and its determinants reveals that research periods often span 20 years, with some extending slightly further, typically 21–29 years. For instance, studies of up to 20 years in duration have been conducted in Thailand, covering the period from 2009 to 2017 (Maneejuk et al., 2021), in Romania from 2011 to 2021 (Enache, 2022), in African countries from 2002 to 2016 (Nomatye & Phiri, 2017), in OECD countries across two different time spans – 1993 to 2011 (Moore & Stockhammer, 2018) and 2002 to 2020 (Dumitrescu et al., 2022), as well as in the EU for the period from

1999 to 2018 (Garšvienė et al., 2022). Longer-term studies, ranging from 21 to 29 years, are also relatively common. Examples include research in the OECD, covering the years 1995 to 2016 (Coletta et al., 2019) and 1995 to 2018 (Abd Samad et al., 2020), in the EU from 1995 to 2019 (Barradas & Tomás, 2023), in Jordan from 1993 to 2018 (Batayneh et al., 2021), and in Portugal from 1988 to 2016 (Romão & Barradas, 2020). However, studies covering more than 30 years remain rare. One notable exception is a study conducted in Malaysia, which analysed 35 years of data from 1984 to 2018 (Mohamed et al., 2020). The scarcity of long-term research may be attributed to data limitations and to the fact that significant structural, economic, and social changes can unfold over long periods, making it challenging to capture their effects accurately in empirical models.

This study examines the impact of macroeconomic factors on household credit across countries. The selection of variables is guided by two key drivers of household borrowing identified in the literature: the cost of credit and the need for financial resources. Interest rates are considered the primary determinant of borrowing costs, while inflation is taken into account for its effects on real debt burdens, purchasing power, and lending risk. Empirical evidence on both variables remains mixed, reflecting differences in economic conditions and institutional contexts.

Households' demand for credit is captured through income, expenditure, and labour market conditions. Income and expenditure are central to borrowing decisions, as households may rely on credit to smooth consumption when expenditures exceed current income. This measure is consistent with consumption-smoothing and life-cycle models. To capture this mechanism parsimoniously, the analysis includes the expenditure-income gap, defined as the difference between logged household expenditure and logged income, which proxies household financial shortfalls rather than borrowing costs. Similar concepts are widely used in public finance (e.g., primary deficits) and in recent institutional analyses of household debt dynamics, where credit-financed expenditure is identified as a key driver of debt accumulation (European Commission, 2023). The gap between expenditure and income provides a simple proxy for households' demand for credit arising from financial constraints rather than borrowing costs alone. Unemployment is included to reflect labour market conditions that may either constrain borrowing through reduced creditworthiness or increase short-term borrowing needs. Housing prices are incorporated as they influence mortgage demand and credit conditions, although their net effect on household borrowing is empirically ambiguous.

All continuous variables are expressed in logarithmic form to improve cross-country comparability and allow coefficients to be interpreted as elasticities. Table 1 presents the variables, definitions, and data sources.

Since statistical data analysis revealed a strong correlation between household income and expenditure changes, we construct the expenditure-income Gap (GAP) as a synthetic proxy for households' short-term financing needs, capturing periods when observed expenditures exceed current income. This derived variable enables us to assess households' financial shortfall in covering their expenses and indicates the potential need for borrowing.

$$GAP = lnExpend - lnIncome. \quad (1)$$

Table 1. Model variables (source: compiled by the authors)

Variable		Abbreviation	Measurement	Data Source
Private credit	Private sector debt: loans to households, consolidated	Private_credit	% of GDP	Eurostat
Interest rate	Long-term interest rates	Interest	% per annum	OECD.Stat
Unemployment	Total unemployment (national estimate)	Unempl	% of the total labour force	World Bank
Inflation	Inflation, consumer prices	Infl	Annual %	World Bank
Household expenditure	Final consumption expenditure of households per capita	Expend	Euros per capita	Eurostat & World Bank data
Household income	Gross disposable income of households per capita	Income	Euros per capita	
Housing prices	Real house price index	RH_Price	Index	OECD.Stat

The following equation describes the model for evaluating the factors influencing household borrowing in different countries:

$$\Delta Private\_credit_{c,t} = \beta_0 + \beta_1 * \Delta Interest_{c,t} + \beta_2 * \Delta Unempl_{c,t} + \beta_3 * lnfl_{c,t} + \beta_4 * GAP_{c,t} + \beta_5 * \Delta lnRH\_Price_{c,t} + \mu_c + \theta_t + \varepsilon_{c,t}. \quad (2)$$

The model's dependent variable (Y) is private credit: household loans. The independent variables (X) include long-term interest rates, overall unemployment, consumer price inflation, the income-expenditure gap (GAP), and real house price indices. The variables for household loans, interest rates, and unemployment are first-differenced; household income and expenditure are log-transformed; and the housing price index is log-differenced. In the model, β_0 represents the constant, β_1 through β_6 are elasticity coefficients, μ denotes country-specific fixed effects, θ represents time dummies, ε is the error term, c is the country index (covering the 27 EU member states), and t denotes the period (23 years, from 2001 to 2023).

The study also examines potential nonlinear relationships between variables that significantly affect household loans, specifically the unemployment rate and the gap between household income and expenditure. Nonlinearity is assessed by including the squares of these variables in the model:

$$\Delta Private\_credit_{c,t} = \beta_0 + \beta_1 * \Delta Interest_{c,t} + \beta_2 * \Delta Unempl_{c,t} + \beta_3 * \Delta Unempl^2_{c,t} + \beta_4 * lnfl_{c,t} + \beta_5 * GAP_{c,t} + \beta_6 * GAP^2_{c,t} + \beta_7 * \Delta lnRH\_Price_{c,t} + \mu_c + \theta_t + \varepsilon_{c,t}. \quad (3)$$

The study applies diagnostic tests to ensure the reliability of the results and the robustness of the model. The Pesaran CD test is used to assess cross-sectional dependence across time series; collinearity among independent variables is examined using correlation diagnostics; autocorrelation is tested using the Durbin-Watson and Wooldridge tests; and heteroskedasticity is checked with the Wald test. Panel data is used, and the most appropriate econometric model, fixed effects, random effects, or OLS, is selected based on the diagnostic results. The empirical analysis employs a panel-data framework to identify broad macroeconomic relationships across EU member states over a long-time horizon. While the main findings remain broadly consistent across alternative panel estimators (pooled OLS,

fixed effects, and random effects), the analysis does not explicitly address potential endogeneity or structural breaks. In particular, interest rates may be jointly determined with credit conditions. These issues are acknowledged as limitations of the study and represent important directions for future research using instrumental-variable approaches, regime-specific models, or country-group analyses.

4. Empirical findings and discussion

From 2001 to 2023, the EU-27 private credit-to-GDP ratio increased substantially overall, despite notable cyclical fluctuations. The ratio rose strongly during the 2000s, reaching elevated levels around the global financial crisis. Although it stabilised and mildly declined in the subsequent decade, it remained well above its early-2000s levels. As a result, the average private credit ratio increased substantially over the period, reaching around 65 % of GDP by 2023. Among member states, Denmark reported one of the highest private credit ratios in 2023, whereas Romania had one of the lowest.

Based on the results of the F-test for fixed effects, the fixed effects model was found to be more appropriate than the pooled OLS model. Furthermore, the Hausman test indicated that the fixed-effects specification is preferred over the random-effects model. Together, these results suggest that unobserved individual-specific characteristics are both statistically significant and correlated with the explanatory variables, thereby justifying the use of a fixed-effects panel regression for the first and second models. The dataset comprises 367 panel observations spanning 23 years. Regression results for all models are summarised in Table 2.

Table 2. Results of the assessment of factors determining private credit in EU countries (source: compiled by the authors)

Variable	Abbreviation	1 model (FE)	2 model (FE)
Constant	*Const*	−2.4240* (1.2830)	−2.2993** (1.2899)
Interest rate	*ΔInterest*	*0.2212*** (*0.1111*)	*0.2630*** (*0.1172*)
Unemployment rate	*ΔUnempl*	*0.4360**** (*0.1405*)	*0.5056**** (*0.1528*)
	$Unempl^2$	–	−0.0295 (0.0254)
Inflation	*Infl*	0.0126 (0.0937)	−0.0125 (0.0969)
GAP (expenditure-income gap)	*GAP*	*13.8944*** (*5.4910*)	*14.9184*** (*5.8263*)
	GAP^2	–	11.8723 (61.9081)
Real housing price indices	*ΔlnRH_Price*	3.0645 (3.0633)	2.7101 (3.0818)
Time dummies	θ_t	+	+
Number of observations	*N*	367	367
Coefficient of determination	R^2	0.4973	0.4995

Note: *–90%, **–95%, ***–99% level of significance.

The results from the regression models provide insights into the macroeconomic determinants of private credit volumes across 27 EU countries from 2001 to 2023. Contrary to conventional economic expectations, the empirical findings indicate that a 1 p.p. increase in the interest rate is associated with a 0.22–0.26 p.p. increase in the volume of private credit (results are in line with Nomatye and Phiri (2017), Enache (2022), Dumitrescu et al. (2022), and Barradas and Tomás (2023). While rising interest rates are generally expected to dampen borrowing activity due to higher financing costs, this counterintuitive result may be explained by behavioural and anticipatory responses from individuals. Specifically, borrowers may accelerate credit applications anticipating further rate increases, motivated by a "now-or-never" logic, particularly for long-term commitments such as housing or investment-related borrowing. Sometimes, such decisions are driven by fear-based expectations or perceived future financial insecurity. However, Abd Samad et al. (2020) and Romão and Barradas (2020) report a negative and statistically significant relationship between interest rates and private credit, consistent with classical economic theory.

The unemployment rate was a statistically significant predictor of private credit, aligning with findings by Abd Samad et al. (2020) and Enache (2022). A 1 p.p. increase in unemployment is associated with an increase in private credit volume by approximately 0.44–0.51 p.p. This result may contradict traditional economic reasoning, which associates higher unemployment with lower borrowing capacity and greater financial uncertainty. Possible explanations include: individuals may rely more heavily on credit to compensate for income shortfalls or maintain consumption during periods of unemployment; Rising unemployment may stimulate demand for more affordable housing, requiring credit for relocation or refinancing; In economies with pronounced seasonal labour markets, credit may act as a buffer during income fluctuations; Expectations of short-term recovery in the labour market may lead individuals to borrow in anticipation of resumed employment. A square of the unemployment rate ($Unempl^2$) was included to test for nonlinearities. Although its coefficient was negative, the effect was statistically insignificant ($p > 0.05$), suggesting no strong nonlinear relationship within the observed data. However, other researchers, including Coletta et al. (2019) and Dumitrescu et al. (2022), found a negative and significant relationship, suggesting that rising unemployment may restrict access to credit and reduce borrowing capacity. The contrast in results across studies may reflect differences in regional labour markets, credit supply conditions, or household expectations.

The analysis revealed a positive, though statistically insignificant, association between inflation and private credit. The results of this study do not align with the findings of Nomatye and Phiri (2017), Abd Samad et al. (2020), and Dumitrescu et al. (2022), who reported a positive statistically significant link, possibly reflecting borrowers' attempts to secure credit before further price increases diminish real purchasing power. Conversely, other studies, such as those by Mohamed et al. (2020), Abd Samad et al. (2020) (in an alternative model), and Batayneh et al. (2021), identified a negative and statistically significant relationship. These mixed results suggest that inflation's influence on private credit may be context-dependent, potentially shaped by monetary policy settings, inflation expectations, and wage dynamics, and thus may play only a secondary or indirect role in credit market behaviour.

The GAP variable, representing the difference between household expenditure and income, was statistically significant and positively associated with private credit. The expenditure-income gap (GAP) exhibits positive, statistically significant coefficients in both models (13.8944 and 14.9184, $p < 0.05$), indicating that households increasingly rely on credit to finance consumption when expenditure growth outpaces income growth. The coefficient must be adjusted accordingly since the dependent variable is not in logarithmic form, but the GAP is. A 1% faster growth in household expenditures relative to income corresponds to a 0.14 – 0.15 p.p. increase in private credit volume (as a share of GDP). This suggests that individuals use credit to cover structural or temporary income deficits. However, including the squared GDP term did not provide evidence of a nonlinear relationship between GDP and private credit.

Although the estimated coefficient on real house prices is economically significant, its standard error is of comparable magnitude, rendering the estimate statistically insignificant. This suggests substantial cross-country heterogeneity and volatility in housing markets rather than a uniform credit-driving effect across EU member states. Our results do not align with the statistically significant findings reported by Moore and Stockhammer (2018), Coletta et al. (2019), Abd Samad et al. (2020), and Barradas and Tomás (2023), which suggest that higher property prices tend to stimulate household borrowing for home acquisition or real estate investment. Furthermore, our findings are inconsistent with those of Nomatye and Phiri (2017), who reported a negative, statistically significant relationship, challenging the conventional view of housing-market-driven credit expansion. These findings suggest that while rising housing prices may exert upward pressure on private credit, the magnitude and direction of this relationship can be moderated by structural factors such as mortgage lending conditions, affordability constraints, and broader economic dynamics.

The empirical findings offer only partial support for the initially formulated hypotheses. Contrary to expectations, rising interest rates and higher unemployment levels were associated with increased private credit volumes, suggesting that anticipatory or compensatory borrowing behaviours may override traditional cost-based constraints. While theoretically relevant, inflation did not have a significant impact on credit dynamics within the observed sample. In contrast, the positive and significant effect of the expenditure-income gap confirms that households rely on credit to finance consumption beyond their income capacity. Finally, the relationship between housing prices and credit was positive but statistically insignificant, indicating that, in this context, housing market developments may not be the primary driver of credit expansion.

5. Conclusions

The findings of this study suggest that household indebtedness, measured by private credit ratio to GDP, increased substantially across many European Union countries during the 2001–2023 period. This trend indicates a growing reliance on credit among households and a corresponding rise in household debt. However, the dynamics of private credit are complex and influenced by a wide range of macroeconomic factors, which vary across countries and over time.

The econometric analysis, which included two fixed-effects models, revealed that not all explanatory variables were statistically significant. Specifically, the results show that interest rates, unemployment, and the income-expenditure gap impact private credit levels in 27 EU countries. In contrast, inflation and the housing price index did not exhibit statistically significant effects in either model specification, suggesting that their influence on household credit is either weak or indirect, or is moderated by other structural and institutional factors not captured in the model.

The results indicate that private credit increases in response to a widening gap between household expenditure and income, as well as rising unemployment and interest rates. These findings have practical implications for credit risk assessment, suggesting that financial institutions could incorporate these variables into lending models to better capture household borrowing behaviour. Moreover, policymakers and regulators may use these indicators to design targeted financial interventions and monitor potential risks to financial stability.

This study has several limitations. Despite the use of country and time-fixed effects, the analysis abstracts from substantial institutional heterogeneity across EU member states, including differences in monetary regimes, mortgage markets, and regulatory frameworks, and therefore captures average EU-level relationships rather than country-specific dynamics. Moreover, the reduced-form panel approach does not fully address potential endogeneity, so the results should be interpreted as associations rather than causal effects. Future research could apply more advanced methods to model heterogeneity, endogeneity, and structural breaks explicitly.

References

Abd Samad, K., Mohd Daud, S. N., & Mohd Dali, N. R. S. (2020). Determinants of household debt in emerging economies: A macro panel analysis. *Cogent Business & Management*, *7*(1), Article 1831765. https://doi.org/10.1080/23311975.2020.1831765

Barradas, R., & Tomás, I. (2023). Household indebtedness in the European Union countries: Going beyond the mainstream interpretation. *PSL Quarterly Review*, *76*(304), 21–49. https://doi.org/10.13133/2037-3643/17894

Batayneh, K., Al Salamat, W., & Momani, M. Q. M. (2021). The impact of inflation on the financial sector development: Empirical evidence from Jordan. *Cogent Economics & Finance*, *9*(1), Article 1970869. https://doi.org/10.1080/23322039.2021.1970869

Bouis, R. (2021). *Household deleveraging and saving rates*: *A cross-country analysis* (IMF Working Paper No. 21/257). International Monetary Fund. https://www.imf.org/-/media/files/publications/wp/2021/english/wpiea2021257-print-pdf.pdf

Chikeya, C. K., & Ntsalaze, L. (2025). Determinants of household debt: A systematic review of the literature. *Economies*, *13*(3), Article 76. https://doi.org/10.3390/economies13030076

Christelis, D., Ehrmann, M., & Georgarakos, D. (2021). Exploring differences in household debt across the United States and Euro Area countries. *Journal of Economic Dynamics and Control*, *53*(2–3), 477–501. https://doi.org/10.1111/jmcb.12769

Coletta, A., De Bonis, R., & Piermattei, S. (2019). Household debt in OECD countries: The role of supply-side and demand-side factors. *Social Indicators Research*, *143*, 1185–1217. https://doi.org/10.1007/s11205-018-2024-y

Coulier, L., & De Schryder, S. (2024). Assessing the effects of borrower-based macroprudential policy on credit in the EU using intensity-based indices. *Journal of International Money and Finance*, *142*, Article 102761. https://doi.org/10.1016/j.jimonfin.2024.103022

De Schryder, S., & Opitz, F. (2021). Macroprudential policy and its impact on the credit cycle. *Journal of Financial Stability*, 53, Article 100818. https://doi.org/10.1016/j.jfs.2020.100818

Dumitrescu, B. A., Enciu, A., Hândoreanu, C. A., Obreja, C., & Blaga, F. (2022). Macroeconomic determinants of household debt in OECD countries. *Sustainability*, *14*(7), Article 3977. https://doi.org/10.3390/su14073977

Enache, C. (2022). Macroeconomic determinants of household indebtedness in Romania: An econometric approach. *Journal of Social & Economic Statistics*, *11*(1–2), 102–117. https://doi.org/10.2478/jses-2022-0006

European Commission. (2023). *Quarterly report on the euro area*. *Volume 22*, *No*. *3*. Publications Office of the European Union.

Garšvienė, L., Balčiūnaitė, K., Matuzevičiūtė, K., & Ruplienė, D. (2022). Assessment of factors determining the level of private credit in European Union countries. *Management of Organizations*: *Systematic Research*, *87*(1), 67–82. https://doi.org/10.2478/mosr-2022-0004

Gründler, D., & Scharler, J. (2025). Bank lending standards and monetary transmission in the euro area. *Economics Letters*, *254*, Article 112413. https://doi.org/10.1016/j.econlet.2025.112413

Hintermaier, T., & Koeniger, W. (2024). Differences in euro-area household finances and their relevance for monetary-policy transmission. *Quantitative Economics*, *15*(4), 1249–1301. https://doi.org/10.3982/qe2068

Khan, H. H. A., Abdullah, H., & Samsudin, S. (2020). The impact of interest rates on household debt accumulation in Malaysia: A structural break analysis. *International Journal of Economics and Business Research*, *19*(2), 193–202. https://doi.org/10.1504/ijebr.2020.104760

Lietuvos bankas. (2024). *Bankų apklausos apžvalga* (*2023 m*. *IV ketv*.) [Bank survey review (4th quarter of 2023)]. https://www.lb.lt/uploads/publications/docs/44222_7f1dca33f0a5b458b2ca1435fbcb974e.pdf

Mamatzakis, E. C., Ongena, S., & Tsionas, M. G. (2023). The response of household debt to COVID-19 using a neural networks VAR in OECD. *Empirical Economics*, *65*, 65–91. https://doi.org/10.1007/s00181-022-02325-2

Maneejuk, P., Teerachai, S., Ratchakit, A., & Yamaka, W. (2021). Analysis of difference in household debt across regions of Thailand. *Sustainability*, *13*(21), Article 12253. https://doi.org/10.3390/su132112253

Mohamed, S., Mohamadon, S. S., Ibrahim, W. M. F. W., Nasrul, F., Hassan, S. S., Isa, M. A. M., & Noh, M. K. A. (2020). The macroeconomic determinants of household debt in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *10*(5), 987–1000. https://doi.org/10.6007/IJARBSS/v10-i5/7425

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*(4), 547–577. https://doi.org/10.1080/01603477.2018.1486207

Nomatye, A., & Phiri, A. (2017). *Investigating the macroeconomic determinants of household debt in South Africa* (MPRA Working Paper No. 83303). Munich Personal RePEc Archive.

O'Donoghue, C., Can, Z. G., Montes-Viñas, A., & Sologon, D. M. (2025). *Macro-economic change and household financial strain in Europe 2006–2022* (IZA Discussion Paper No. 17739). SSRN. https://doi.org/10.2139/ssrn.5160851

Pulina, G. (2023). *Consumer debt in Luxembourg and the euro area*: *Evidence from the Household Finance and Consumption Survey* (BCL Working Paper No. 175). Banque Centrale du Luxembourg. https://www.bcl.lu/en/publications/Working-papers/175/BCLWP175.pdf

Romão, A., & Barradas, R. (2020). Macroeconomic determinants of households' indebtedness in Portugal: What really matters in the era of financialisation? *International Journal of Finance & Economics*, *29*(1), 383–401. https://doi.org/10.1002/ijfe.2690

Strzelecka, A., & Zawadzka, D. (2020). Why households borrow money? Socio-economic factors affecting households' debts: A model approach. *European Research Studies Journal*, *23*(S2), 820–839. https://doi.org/10.35808/ersj/1900

Turinetti, E., & Zhuang, H. (2011). Exploring determinants of U.S. household debt. *Journal of Applied Business Research*, 27(6), 85–92. https://doi.org/10.19030/jabr.v27i6.6468

Zhou, S., & Niyitegeka, O. (2023). On the dynamic relationship between household debt and income inequality in South Africa. *Journal of Risk and Financial Management*, *16*(10), Article 427. https://doi.org/10.3390/jrfm16100427