

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

Inês Tomás
Ricardo Barradas
Maio de 2021

WP n.º 2021/03

DOCUMENTO DE TRABALHO

WORKING PAPER

dinamia'cet _iscte
Centro de Estudos sobre a Mudança
Socioeconómica e o Território

iscte INSTITUTO
UNIVERSITÁRIO
DE LISBOA

FCT
Fundação para a Ciência e a Tecnologia
A NÚMERO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

Inês Tomás*

Ricardo Barradas**

WP n. º 2021/03

DOI: 10.15847/dinamiacet-iul.wp.2021.03

1. INTRODUCTION	3
2. THEORETICAL AND EMPIRICAL EVIDENCE ON HOUSEHOLD INDEBTEDNESS	5
3. THE MODEL AND HYPOTHESES ON HOUSEHOLD INDEBTEDNESS.....	9
4. THE DATA SET	11
5. THE ECONOMETRIC METHOD	13
6. EMPIRICAL FINDINGS AND DISCUSSION	14
7. CONCLUSION	19
8. REFERENCES	22
9. APPENDIX	27

*Solvay Business Services Portugal, Lisboa, Portugal. E-mail: ines.mtomas@gmail.com

**DINÂMIA'CET-Iscte, Instituto Universitário de Lisboa, Lisboa, Portugal. Email: ricardo_barradas@iscte-iul.pt (corresponding author)

Household indebtedness in the European Union countries: Going beyond the mainstream interpretation¹

ABSTRACT

This paper develops a panel data econometric analysis in order to determine the main macroeconomic causes of household indebtedness in the European Union countries from 1995 to 2019. During that time, household indebtedness reached unprecedented and unsustainable levels, which played a crucial role in the emergence of the last financial and economic crisis. This is not clearly well interpreted by the mainstream economics, which advocates that household indebtedness is just an instrument to smooth consumption in a continuous process of utility maximization over life. This paper estimates a model according to which the household indebtedness depends on seven macroeconomic causes, namely housing prices, financial asset prices, personal income inequality, the households' labour income, welfare state expenditures, the working-age population and interest rates. This paper finds that housing prices, welfare state expenditures and interest rates impact positively on household indebtedness in the European Union countries, whilst the financial asset prices, personal income inequality and households' labour income impact negatively on household indebtedness in the European Union countries. This paper also finds that the fall of household labour income and the rise of the housing prices have been main triggers of household indebtedness in the European Union countries since 1995.

Keywords: European Union, Households' Indebtedness, Panel Data, Fixed Effects Two-Stage Least Squares.

JEL CLASSIFICATION: C23, D10, E21 and R20

¹ The authors thank the helpful comments and suggestions of Sérgio Lagoa. The usual disclaimer applies.

1. INTRODUCTION

The conventional economic theory, based on the life cycle and permanent income theories of consumption (Modigliani and Brumberg, 1954; Friedman, 1957; Ando and Modigliani, 1963), advocates that households maximize their utility functions over their entire life in order to smooth consumption, which implies that household indebtedness is only a neutral tool that aims to transfer lifetime income and wealth across time (Barba and Pivetti, 2009; Kim et al., 2014). Against this background, the conventional economic theory does not provide a reasonable interpretation of the unprecedented and unsustainable levels of household indebtedness reached in the last years and, in particular, up to the Great Recession, because the institutional and social contexts, the psychological factors and/or the existence of habits are completely ignored (Cynamon and Fazzari, 2008; Palley, 2010).

Against this backdrop, Moore and Stockhammer (2018), by falling back mainly on non-mainstream interpretations and different strands of literature, find eight macroeconomic causes of household indebtedness, namely the growth of housing prices, the increase of financial asset prices, the rise of personal income inequality, the fall of households' labour income, the welfare state retrenchment, the rise of the working-age population, the decreasing trend of interest rates and the greater availability of credit.

Chrystal and Mizen (2005), Kohn and Dynan (2007), Oikarinen (2009), Gimeno and Martinez-Carrascal (2010), Valverde and Fernandez (2010), Anundsen and Jansen (2013), Meng et al. (2013), Rubaszek and Serwa (2014), Klein (2015), Malinen (2016), Moore and Stockhammer (2018), Stockhammer and Wildauer (2018) and Romão and Barradas (2021) are examples of empirical econometric studies that assess the macroeconomic causes of household indebtedness, but they do not take into account all of the aforementioned eight macroeconomic causes. This increases the risk that their results could be biased and inconsistent because several relevant macroeconomic causes are clearly omitted (Greene, 2003; Wooldridge, 2003). Moore and Stockhammer (2018) and Romão and Barradas (2021) are the most complete empirical studies on this matter since they test all of these macroeconomic causes of household indebtedness, with the exception of the one related to greater availability of credit, due to the inexistence of data. Moore and Stockhammer (2018) conclude that housing prices are the main macroeconomic cause of the household indebtedness in the Organisation for Economic Co-

operation and Development (OECD) countries. Romão and Barradas (2021) conclude that housing prices and financial asset prices are the main macroeconomic causes of the household indebtedness in Portugal.

This paper develops a panel data econometric analysis in order to determine the main macroeconomic causes of household indebtedness in the European Union (EU) countries from 1995 to 2019 and extends the existing literature in at least four different ways. Firstly, this paper is focused on the macroeconomic causes of household indebtedness in the EU countries, for which the empirical evidence is notably scarce. The EU countries are an interesting case study as they present a certain institutional heterogeneity, despite being integrated in the same economic and political region. The majority of these countries has experienced an increasing trend in household indebtedness (Figure A1 in the Appendix), which played a crucial role in the emergence of the last financial and economic crisis (Mian and Sufi, 2014; Moore and Stockhammer, 2018). Moreover, the southern European countries and the Anglo-Saxon European Countries have even developed ‘credit-financed consumption-led booms’ and ‘debt-driven demand regimes’ (Stockhammer and Kohler, 2019). Secondly, this paper performs a time series econometric analysis by employing the fixed effects two-stage least squares (FE2SLS) estimator in order to take into account the heterogeneity across the EU countries and to contour the potential problem of endogeneity that arises when a relevant variable is omitted (Greene, 2003; Wooldridge, 2003). Note that all the aforementioned eight macroeconomic causes will be tested throughout this paper, with the exception of the one linked to the greater availability of credit, due to data availability. Thirdly, the paper assesses the macroeconomic causes of household indebtedness in the EU countries covering a period where the evolution of household indebtedness was not linear (Figure A1 in the Appendix). We cover both a period where we observe an increasing trend of household indebtedness and a period where we observe a decreasing trend of household indebtedness in the EU countries (Figure A1 in the Appendix) in order to identify the macroeconomic causes that are responsible of such evolution. Fourthly, and contrary to the majority of empirical studies on this issue, this paper also identifies the economic effects household indebtedness in order to ascertain the role of each macroeconomic cause on its evolution in the EU countries.

Our empirical findings reveal that housing prices, welfare state expenditures and interest rates impact positively on household indebtedness in the EU countries, whilst financial asset prices, personal income inequality and households’ labour income impact negatively. Our

empirical findings also show that the fall of household labour income and the rise of housing prices have been the main triggers of household indebtedness in the EU countries since 1995. The remainder of the paper is organized as follows. In Section 2, we provide theoretical and empirical evidence on household indebtedness. Section 3 presents the model and hypotheses on household indebtedness. The data set and the econometric method are described in Section 4 and in Section 5, respectively. Section 6 presents the empirical findings and the respective discussion. Finally, Section 7 concludes.

2. THEORETICAL AND EMPIRICAL EVIDENCE ON HOUSEHOLD INDEBTEDNESS

Mainstream economics, mainly relying on the life cycle and permanent income theories of consumption, argues that households are rational, perfectly informed and forward-looking economic agents that maximize their utility functions over their entire life in order to smooth consumption (Modigliani and Brumberg, 1954; Friedman, 1957; Ando and Modigliani, 1963). According to these theories, households incur debt just as an instrument of optimal intertemporal consumption smoothing in the face of temporary and predictable deviations in their income levels, which means that household indebtedness is a neutral tool that aims to transfer lifetime income and wealth across time (Barba and Pivetti, 2009; Kim et al., 2014).

Nonetheless, the growth of household indebtedness in the last years to unprecedented and unsustainable levels, particularly up to the Great Recession, seems to put into question this benign view of the conventional economic theory to explain this household behaviour, which tends to be deeply influenced by the institutional and social contexts, psychological factors and/or the existence of habits (Cynamon and Fazzari, 2008; Palley, 2010). Effectively, it is increasingly difficult to advocate that situations of household over-indebtedness or even household default are due to their rational decisions. These have occurred not only in the case of housing credit, but especially in other forms of credit such as consumer credit, credit cards, and overdraft banking accounts (Stockhammer, 2009).

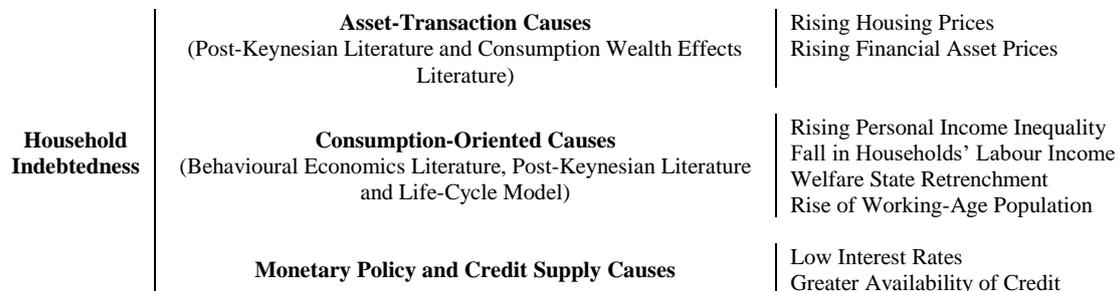
The growth of household indebtedness has even represented a stylized fact in the majority of countries in the last more financialized years, including in the EU, where household indebtedness has already overtaken the total national income in some of countries (Figure A1 in

**Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation**

the Appendix). This is the case of Cyprus, Denmark, Ireland, the Netherlands, Portugal and the United Kingdom. As emphasized by Stockhammer and Kohler (2019), some of these countries (particularly the Southern and the Anglo-Saxon ones) have experienced ‘credit-financed consumption-led booms’ and growth models supported by household indebtedness, i.e. the so-called ‘debt-driven demand regimes’, which has made them more vulnerable to any downside risks. This was what happened in the Great Recession, where household indebtedness played a central role to the emergence of that crisis (Mian and Sufi, 2014; Moore and Stockhammer, 2018).

Against this background, we need to go beyond the mainstream interpretation in order to better ascertain the macroeconomic causes of household indebtedness, which will be crucial to the implementation of several economic policies to revert the increasing trend of this debt and thus to avoid the emergence of new financial and economic crises in the coming future. By relying on the existing literature and mainly on non-mainstream interpretations on this matter, Moore and Stockhammer (2008) identify eight macroeconomic causes of household indebtedness, which can be grouped into three different categories of causes from several strands of the literature (Figure 1).

Figure 1. Macroeconomic Causes of Household Indebtedness



Source: Authors’ representation based on Moore and Stockhammer (2018) and Romão and Barradas (2021)

As clearly described by Romão and Barradas (2021), the majority of these eight macroeconomic causes of household indebtedness are indeed general trends observed in the majority of countries since the mid-1980s, which are clearly related with the processes of neoliberalism, globalization and financialization that have marked the evolution of the contemporary world since that time. Most of them are also visible in the EU countries (Figure A2

Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

to Figure A8 in the Appendix). In what follows, we explain in detail how the household indebtedness is caused by each one of these eight macroeconomic causes.

First, the growth of housing prices feeds household indebtedness, particularly due to two different channels (Godley and Lavoie, 2007; Ryoo, 2016). On the one hand, the growth of housing prices increases households' collateral, which relaxes households' credit constraints and allows them to borrow more. This is the so-called 'liquidity constraints effect' (Ludwig and Sløk, 2001), which is based on the financial accelerator theory (Bernanke et al., 1996). On the other hand, the growth of housing prices increases households' wealth, which boosts their expenditures that would be realized by borrowing against the value of their houses. This is the so-called 'realized wealth effect' (Ludwig and Sløk, 2001), according to which households can take out equity in the form of refinancing or selling the house to support their expenditures. Second, the growth of financial asset prices also boosts the household indebtedness because they take on debt as a way of leveraging to purchase more financial assets (Cooper and Dynan, 2016). This behaviour is also shared by low-income and middle-class households (Barba and Pivetti, 2009; Van der Zwan, 2014; Barradas, 2016). Similarly to what happens in the case of housing prices, the growth of financial asset prices also increases households' collateral and households' wealth, which allow households to borrow more (Ludwig and Sløk, 2011). Third, the rise of personal income inequality also contributes to the growth of household indebtedness (Frank et al. 2014), in a context where the poorer households take on debt in their aspiration for the lifestyle and consumption standards of richer households. This is the so-called 'demonstration effect' or 'Duesenberry effect' (Duesenberry, 1949), according to which households denote an 'expenditure cascades' behaviour or a 'keeping up with the Joneses' behaviour, namely with regard to Veblen's theory of conspicuous consumption and other durable goods through borrowing. In the last few decades, this behaviour was intensified by the appearance of new goods and services (e.g. cell phones and other information and communication technology devices), perceived as tempting among low-income and middle-class households (Barba and Pivetti, 2009) who are strongly influenced by advertising, marketing and mass media (Cynamon and Fazzari, 2008). Fourth, the fall of households' labour income also motivates the growth of household indebtedness (Barba and Pivetti, 2008; Stockhammer, 2012, 2015). The argument here is that the debt functions as a substitute for wages by allowing that households to maintain their standard of living even when they face a decrease in their labour income. This is associated with the so-called 'ratchet effect'

(Duesenberry, 1949), according to which households try to maintain their lifestyle because they are simply accustomed to it and they are not willing to show to other households that they have lost their lifestyle. Fifth, the welfare state retrenchment triggers household indebtedness because households are obliged to take on debt in order to fulfil their basic needs and to ensure the maintenance of the quantity and/or the quality of several services (e.g. housing, health, education, pensions and transportation). This is especially relevant in a context where the public provision of these services is decreasing *vis-à-vis* the increasing importance of private provision mediated by finance (Finlayson, 2009; Lapavitsas, 2013), namely through the use of public-private partnerships financed by banks (Barradas et al., 2018) or through the privatization of public corporations (Barradas, 2019). Sixth, the increase in the working-age population causes a growth in household indebtedness because this corresponds to the group of the population that takes on debt, in a context where the group of non-working young population does take on any loans because they do not earn any income and they are fully credit-constrained, and the group of the non-working elderly population group only spends their savings (Modigliani and Brumberg, 1954). Note also that the baby-boomer generation, which currently belongs to the working-age population, has exhibited a less risk averse and a more relaxed behaviour toward taking on debt compared to the other generations (Cynamon and Fazzari, 2008). Seventh, the low level of interest rates determines household indebtedness because the respective costs of borrowing are cheaper, which stimulates the credit demand (Taylor, 2009). Eighth, the greater availability of credit causes household indebtedness by allowing households, including low-income and middle-class ones, to borrow more than previously because of the corresponding rise in credit supply (Moore and Stockhammer, 2018). The increasing trend in the credit supply has been fed by the financial innovation with regards to securitization (Hein, 2012), the technological progress and the corresponding improvement in credit scoring models (Cynamon and Fazzari, 2008), the greater competition among banks and other financial institutions (Boone and Girouard, 2002) and the existence of some aggressive and predatory credit policies (Stockhammer, 2009).

Several empirical studies can be identified in the literature that aims to address the causes of household indebtedness. Chrystal and Mizen (2005), Kohn and Dynan (2007) Oikarinen (2009), Gimeno and Martinez-Carrascal (2010), Valverde and Fernandez (2010), Anundsen and Jansen (2013), Meng et al. (2013), Rubaszek and Serwa (2014), Klein (2015), Malinen (2016), Moore and Stockhammer (2018), Stockhammer and Wildauer (2018), and Romão and Barradas

(2021) are some examples. However, the majority of these empirical studies face at least one important shortcoming, namely they do not test simultaneously all the aforementioned eight macroeconomic causes of household indebtedness. This increases the risk that their estimates could be biased and inconsistent because several relevant variables are clearly omitted (Greene, 2003; Wooldridge, 2003). Moore and Stockhammer (2018) and Romão and Barradas (2021) are the only two exceptions, having taken into account seven of the aforementioned eight macroeconomic causes of household indebtedness. Due to data availability, the macroeconomic cause related with the greater availability of credit was not taken into account in these two empirical studies. The former performed a panel data econometric analysis for 13 countries of the OECD (Australia, Belgium, Canada, Finland, France, Germany, Italy, Japan, Norway, Spain, Sweden, the United Kingdom and the United States) from 1993 to 2011 and concluded that housing prices is the most robust macroeconomic cause of household indebtedness in these countries. The latter performed a time series econometric analysis for Portugal from 1988 to 2016 and concluded that housing prices and financial asset prices are the main macroeconomic causes of Portuguese household indebtedness.

Similarly to Moore and Stockhammer (2018) and Romão and Barradas (2021), this paper aims to assess the macroeconomic causes of household indebtedness by performing a panel data econometric analysis for all the EU countries from 1995 to 2019.

3. THE MODEL AND HYPOTHESES ON HOUSEHOLD INDEBTEDNESS

Our model is based on an aggregate equation according to which household indebtedness depends on the macroeconomic causes described in the previous Section, namely housing prices, financial asset prices, personal income inequality, the household labour income, welfare state expenditures, the working-age population and interest rates. The macroeconomic cause linked to the greater availability of credit was not incorporated in our model due to the inexistence of a reasonable proxy with which to assess it.

Our model for household indebtedness takes the following form:

$$HI_{i,t} = \beta_0 + \beta_1 HP_{i,t} + \beta_2 FAP_{i,t} + \beta_3 IN_{i,t} + \beta_4 LI_{i,t} +$$

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

$$+\beta_5 WS_{i,t} + \beta_6 WP_{i,t} + \beta_7 IR_{i,t} + \alpha_{i,t} \quad (1)$$

where i is the country, t is the time period (years), HI is the households' indebtedness, HP is the housing prices, FAP is the financial asset prices, IN is the personal income inequality, LI is the household labour income, WS is welfare state expenditures, WP is the working-age population, IR is interest rates and a is the two-way error term component accounting for unobservable country-specific effects and time-specific effects.

As described in the previous Section, housing prices, financial asset prices, personal income inequality and the working-age population are expected to impact positively on household indebtedness, whilst household labour income, the welfare state expenditures and the interest rates are expected to impact negatively on household indebtedness. According to our hypotheses, the estimated coefficients of our variables should present the following signs:

$$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0, \beta_6 > 0, \beta_7 < 0 \quad (2)$$

It is worth noting that our model is based on an aggregate equation to estimate the macroeconomic causes of household indebtedness in the EU countries from 1995 to 2019. This macroeconomic approach assumes the existence of a representative household, according to which its behaviour does not change across time and space. This approach could lead to several shortcomings in our analysis. The first one is related to the impossibility of assessing the macroeconomic causes of household indebtedness according to household characteristics (e.g. dimension, age, qualifications, occupation, and social stratum). The second one is linked to the impossibility of assessing the macroeconomic causes of household indebtedness per country because we are using a panel data econometric analysis that estimates an average effect of several countries. In fact, our approach allows us to understand the macroeconomic causes of household indebtedness in these countries as a whole, by looking beyond the specificities of each household in each country. If our macroeconomic causes are proved to exert an effect on household indebtedness, we are unable to know whether that effect occurs in only some households or countries or whether it is a more generalized effect across all households or all countries. If our macroeconomic causes are proved to exert no effect on household indebtedness, we cannot reject it if there is an effect in some households or some countries but at an insufficient level to create a general effect in all households or all countries as a whole.

4. THE DATA SET

Our data set encompasses annual data for all the EU countries from 1995 to 2019. These are the period and the periodicity for which all variables are available. Our dataset represents a panel data including a total of 28 cross-sectional units (N=28) observed over time from 1995 to 2019 (T=25). Our data set is an unbalanced panel due to the inexistence of data for all the variables for all the years for each country. Table 1 describes the data set, which includes a total of 511 observations and a total of 189 missing values.

Table 1. Data set

Country	Period	Observations	Missing
Austria	2000-2019	20	5
Belgium	1995-2019	25	0
Bulgaria	2005-2018	14	11
Croatia	2011-2018	8	17
Cyprus	2004-2018	15	10
Czechia	2008-2019	12	13
Denmark	1995-2018	24	1
Estonia	2005-2019	15	10
Finland	1996-2018	23	2
France	2003-2018	16	9
Germany	1995-2018	24	1
Greece	1997-2019	23	2
Hungary	2007-2018	12	13
Ireland	2001-2018	18	7
Italy	1995-2019	25	0
Latvia	2006-2019	14	11
Lithuania	1999-2019	21	4
Luxembourg	2007-2018	12	13
Malta	2007-2019	13	12
Netherlands	1995-2019	25	0
Poland	2005-2019	15	10
Portugal	1995-2019	25	0
Romania	2009-2010	11	14
Slovakia	2005-2019	15	10
Slovenia	2007-2019	13	12
Spain	1995-2019	25	0
Sweden	1996-2019	24	1
United Kingdom	1995-2018	24	1

In what follows, we describe definitions, units and sources for each variable. Household indebtedness corresponds to the total financial liabilities of households and non-profit institutions serving households in percentage of the gross domestic product, available in the Eurostat database. Housing prices are quantified through the natural logarithm of the real housing price index (2015 = 100), from the Eurostat, OECD and Bank for International Settlements databases.

**Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation**

Financial asset prices are proxied by the natural logarithm of the total share price indexes (2015 = 100) from the Fred St. Louis database and Investing database. The personal income inequality is measured through the top 1% income share, available in the World Inequality database. Households' labour income corresponds to the adjusted labour share, i.e. the ratio of the compensation of employees per employee to the gross domestic product at current market prices per employee, available in the AMECO database. The welfare state expenditure is assessed by the general government expenditures on education, health and housing and community amenities in percentage of the gross domestic product, which was collected from the Eurostat database. The working-age population corresponds to the activity rate, i.e. the total active population divided by the total population aged between 15 and 64 years, extracted directly from the Eurostat database. The level of interest rates corresponds to the real short-term interest rates (using the gross domestic product deflator), available in the AMECO database.

Plots of all variables are illustrated in Figure A1 to Figure A8 in the Appendix, the descriptive statistics are exhibited in Table 2 and the correlation matrix is presented in Table 3.

Table 2. The descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis
HI	0.604	0.543	1.496	0.021	0.305	0.792	3.053
HP	4.590	4.607	5.145	3.571	0.252	-1.155	5.552
FAP	4.556	4.556	9.176	2.731	0.639	2.702	18.691
IN	0.105	0.106	0.187	0.058	0.022	0.427	3.481
LI	0.532	0.533	0.638	0.338	0.050	-0.412	3.310
WS	0.120	0.118	0.163	0.080	0.017	0.087	2.350
WP	0.715	0.719	0.829	0.577	0.052	-0.322	2.492
IR	0.002	0.0004	0.253	-0.095	0.027	2.069	19.441

Table 3. The correlation matrix

	HI	HP	FAP	IN	LI	WS	WP	IR
HI	1.000							
HP	0.114***	1.000						
FAP	0.008	0.435***	1.000					
IN	-0.085*	0.037	0.009	1.000				
LI	0.306***	0.020	-0.102**	-0.235***	1.000			
WS	0.385***	-0.130***	-0.282***	-0.278***	0.415***	1.000		
WP	0.531***	-0.076*	-0.103**	0.062	0.090**	0.421***	1.000	
IR	-0.024	-0.376***	-0.209***	-0.046	0.105**	0.032	-0.182***	1.000

Note: *** indicates statistical significance at 1% level, ** indicates statistical significance at 5% level and * indicates statistical significance at 10% level

The hypothesis on the existence of multicollinearity between our variables is strongly rejected, namely because all correlations are less than 0.8 in absolute terms (Studenmund, 2005). As expected, the housing prices, the financial asset prices, the welfare state expenditures and the working-age population are positively correlated with the household indebtedness in the EU countries, whilst interest rates are negatively correlated with the household indebtedness in the EU countries.

5. THE ECONOMETRIC METHOD

Our econometric method involves the implementation of the FE2SLS estimator for three different reasons. Firstly, the traditional panel data estimators (e.g. pooled ordinary least squares, fixed effects and random Effects) produce biased and inconsistent estimates in the presence of endogeneity (Greene, 2003; Wooldridge, 2003). This is especially relevant in our model not only due to the omission of the macroeconomic cause of household indebtedness related to the greater availability of credit, but also due to the potential existence of a reverse causation between the household indebtedness and some of our dependent variables. Secondly, the FE2SLS estimator allows us to deal with unobservable heterogeneity across our cross-sectional units observed over time, i.e. country-specific (and also time-specific) effects (Greene, 2003). Thirdly, the FE2SLS estimator produces reliable estimates in terms of efficiency and consistency even in the presence of endogeneity (Wooldridge, 2003).

The implementation of the FE2SLS estimator implies the need to define a set of instrumental variables (i.e. the so-called instruments), which should be at least equal to the number of dependent variables in our model. Instruments should be variables that do not appear as dependent variables in our model (but they are strongly correlated with them) and are simultaneously exogenous (orthogonal) in relation to the error term component (Greene, 2003; Wooldridge, 2003). The suitability of our model and the validity of our set of instruments are tested using the J-Statistic of Hansen (1982). The traditional rule of thumb is to choose as instruments the lagged variables of the dependent variables that are potentially endogenous.

Accordingly, our set of instruments encompasses five lags of the variables housing prices, financial asset prices, personal income inequality and interest rates².

The EViews software (version 11) is used to obtain our estimates. Our estimates are produced not only for all the period as a whole (i.e. from 1995 to 2019) but also for two specific subperiods, where we identify a different behaviour in the evolution of household indebtedness in the EU countries (Figure A1 in the Appendix). The first subperiod is from 1995 to 2009 and corresponds to a period of increasing household indebtedness in the EU countries, and the second subperiod is from 2010 and 2019 and corresponds to a period of a decrease in household indebtedness in the EU countries due to the ongoing deleverage process since the Great Recession. The idea is to better understand the main macroeconomic causes that are responsible for this evolution of household indebtedness in the EU countries and the identification of potential asymmetries in the effects of these macroeconomic causes on household indebtedness. The robustness of our estimates is assessed by a jack-knife analysis by excluding one country at a time for all the period as a whole and for the two subperiods, respectively.

Finally, the economic effects of our estimates are also presented (McCloskey and Ziliak, 1996; Ziliak and McCloskey, 2004) in order to ascertain the role of each macroeconomic cause as a driver of household indebtedness in the EU countries.

6. EMPIRICAL FINDINGS AND DISCUSSION

The results of our estimates for the household indebtedness in the EU countries, produced by the FE2SLS estimator, are presented in Table 4.

² We consider that housing prices, financial asset prices, personal income inequality and interest rates are the potential endogenous variables in our model. Effectively, it is intuitively plausible to assume a reverse causation between the household indebtedness and these four variables. The growth of household indebtedness could imply a rise in housing prices and in the financial asset prices due to the increase of the corresponding demand for houses and for financial assets. The growth of household indebtedness could imply a rise in personal income inequality, particularly between those households who have access to credit and those that are more credit constrained. The growth of household indebtedness could imply a rise in interest rates due to the increase in credit risk.

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

Table 4. Estimates for the household indebtedness in the EU countries³

Variable	1995-2019	1995-2009	2010-2019
β_0	2.737* (1.473) [1.858]	-1.795 (1.290) [-1.392]	1.518 (1.101) [1.378]
HP_t	0.243** (0.105) [2.320]	0.256*** (0.060) [4.266]	0.021 (0.119) [0.178]
FAP_t	-0.054* (0.030) [-1.777]	0.154** (0.069) [2.227]	-0.029 (0.032) [-0.895]
IN_t	-2.205* (1.181) [-1.867]	-3.871*** (0.999) [-3.874]	0.559 (1.013) [0.552]
LI_t	-3.945** (1.668) [-2.365]	1.409 (1.442) [0.977]	-1.887* (1.079) [-1.748]
WS_t	13.991*** (3.141) [4.455]	2.947 (2.899) [1.016]	18.491*** (3.491) [5.297]
WP_t	-3.199 (2.388) [-1.339]	-0.209 (1.421) [-0.147]	-2.925 (2.050) [-1.427]
IR_t	3.724*** (1.257) [2.962]	2.157*** (0.688) [3.133]	2.345* (1.376) [1.704]
Observations	371	144	247
Cross-Sectional Units	28	20	28
Time Effects	Yes	Yes	Yes
R-Squared	0.862	0.981	0.932
Adjusted R-Squared	0.839	0.975	0.917
J-Statistic (P-Value)	0.680	0.138	0.680

Note: Standard errors in (), t-statistics in [], *** indicates statistical significance at 1% level, ** indicates statistical significance at 5% level and * indicates statistical significance at 10% level

With regard to the full period as a whole, our results confirm that all variables are statistically significant at the conventional significance levels, with the exception of the working-age population. This result does not support the macroeconomic cause related with the life-cycle model (Modigliani and Brumberg, 1954). This seems to indicate that the growing importance of the working-age population in the EU countries (Figure A7 in the Appendix) does not cause household indebtedness, probably because they are facing more precarious labour conditions (Tridico and Pariboni, 2018), which tends to increase their credit constraints and prevent the

³ In the model corresponding to the subperiod of 1995 to 2009, our set of instruments encompass four lags of the variables of housing prices, financial asset prices, personal income inequality and interest rates because if we had used five lags for these variables we would reject the null hypothesis of the J-Statistic on the suitability of our model and the validity of our instruments.

corresponding indebtedness. The statistical insignificance of the working-age population was also found by Moore and Stockhammer (2018). The remaining variables are statistically significant at the traditional significance levels, but the majority of them exhibited unexpected effects on the household indebtedness in the EU countries. The financial asset prices exert a negative impact on households' indebtedness in the EU countries, which does not corroborate with the argument that upward movements of financial asset prices lead households to incur debt as leverage to acquire more financial assets (Cooper and Dynan, 2016). Instead, this negative relationship between the financial asset prices and household indebtedness could suggest that households in the EU countries enjoy the periods of growth in financial asset prices to sell them in order to use this income to repay their existing debts, which favours a decline in their indebtedness. This mechanism could be particularly relevant in situations of over-indebtedness in order to avoid partial or total defaults by households. In the same vein, the personal income inequality also impacts negatively on household indebtedness in the EU countries, which is not in line with the macroeconomic cause associated with the 'expenditure cascades' behaviour or a 'keeping up with the Joneses' behaviour (Frank et al. 2014)⁴. As argued by Pardo and Santos (2014), the rise of personal income inequality could result in a decline in household indebtedness because the low-income and middle-class households are more credit-constrained. The welfare state expenditures also exhibit a counter-intuitive impact by exerting a positive influence on household indebtedness in EU countries. Nevertheless, this result is not too surprising because there has not been a notable welfare state retrenchment in EU countries (Figure A6 in the Appendix), contrary to the predictions of Finlayson (2009) and Lapavistas (2013). Effectively, the sustained path in the welfare state expenditures in the EU countries could be the cause of a growth in the household indebtedness because they feel more protected by the State, which favours a less risk averse and more relaxed behaviour toward incurring debt. This is the so-called 'free-rider problem', which tends to vary proportionally to the generosity of the respective welfare state (Homburg, 2000). A similar result was found by Romão and Barradas (2021) for the specific case of household indebtedness in Portugal. Unexpectedly, interest rates influence positively the household indebtedness in EU countries. This seems to suggest that the rise in interest rates could increase household indebtedness in the EU countries, for instance in order to avoid higher costs of

⁴ Please note that this negative effect of personal income inequality on households' indebtedness in the EU countries does not change if we use the top 10% income share instead of the top 1% income share. Results are available upon request.

borrowing in the future if the increasing trend on the level of interest rates persist. This could be quite relevant due to the general recognition that the majority of central banks all over the world conduct their monetary policy with a strong inertia (Clarida et al., 1998). Note also that this result could be explained by the banks' behaviour, which tends to be more willing to lend when interest rates are increasing because they make more profit. Finally, the housing prices and households' labour income also determines the household indebtedness in the EU countries, by exerting both a positive and a negative effect, respectively. A positive impact of housing prices on household indebtedness was also reported by Chrystal and Mizen (2005), Kohn and Dynan (2007), Oikarinen (2009), Gimeno and Martinez-Carrascal (2010), Valverde and Fernandez (2010), Anundsen and Jansen (2013), Meng et al. (2013), Rubaszek and Serwa (2014), Moore and Stockhammer (2018), Stockhammer and Mildauer (2018) and Romão and Barradas (2021), which confirms the theoretical hypothesis of the post-Keynesian literature related to the collateral effects (Godley and Lavoie, 2007) and of the consumption wealth effects literature linked to the wealth effects (Ryoo, 2016). A negative impact of the households' labour income on the household indebtedness was also found by Klein (2015), which is consistent with the post-Keynesian literature that households' indebtedness functions as a substitute of households' labour income (Barba and Pivetti, 2008; Stockhammer, 2012 and 2015).

Regarding the two subperiods, our results do not change notably in comparison to the full period as a whole, albeit presenting some specificities according to the respective trend on the evolution of the household indebtedness in the EU countries in each subperiod. Three particular comments should be highlighted. Firstly, the working-age population continues to be statistically insignificant for the two subperiods. Secondly, the statistical significance of the interest rates and their positive effect on households' indebtedness occur both in the period of an increasing and in the period of a decreasing trend of households' indebtedness in the EU countries. Thirdly, the remaining variables seem to suggest the existence of asymmetries in their effects on household indebtedness. On the one hand, the macroeconomic causes related to housing prices, financial asset prices and personal income inequality are only relevant in periods where household indebtedness is increasing. In fact, these variables are statistically significant only in the first subperiod and they have the same effects on household indebtedness as in the full period as a whole. The only exception pertains to the variable of financial asset prices that impacts positively on household indebtedness in the EU countries in periods where that indebtedness is increasing, probably as leverage to the acquisition of further financial assets (Cooper and Dynan, 2016). On

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

the other hand, the macroeconomic causes associated with the households' labour income and welfare state expenditures are only pertinent in periods where household indebtedness is decreasing. Effectively, these variables are statistically significant only in the second subperiod and they have the same effects on household indebtedness as in the full period as a whole.

All of these results are notably robust to resampling. Through a jack-knife analysis, all of these results were re-estimated by excluding one country at a time for all the period as a whole and for the two subperiods. We concluded that the majority of our variables maintain their statistical significance and the same effects on household indebtedness in comparison with the results for all the EU countries that are exhibited in Table 4⁵.

The results of the economic effects for the households' indebtedness in the EU countries, are presented in Table 5.

Table 5. Economic effects of the estimates for household indebtedness in the EU countries

Period	Variable	Coefficient	Actual Cumulative Change	Economic Effect
1995-2019	<i>HP_t</i>	0.243	0.530	0.129
	<i>FAP_t</i>	-0.054	1.100	-0.059
	<i>IN_t</i>	-2.205	0.151	-0.333
	<i>LI_t</i>	-3.945	-0.076	0.300
	<i>WS_t</i>	13.991	-0.001	-0.014
	<i>IR_t</i>	3.724	-1.605	-5.977
1995-2009	<i>HP_t</i>	0.256	0.410	0.105
	<i>FAP_t</i>	0.154	0.930	0.143
	<i>IN_t</i>	-3.871	0.104	-0.403
	<i>IR_t</i>	2.157	-0.395	-0.852
2010-2019	<i>LI_t</i>	-1.887	0.004	-0.008
	<i>WS_t</i>	18.491	-0.067	-1.239
	<i>IR_t</i>	2.345	-5.600	-13.132

Note: The actual cumulative change corresponds to the growth rate of the correspondent variable during the respective period. The economic effect is the multiplication of the coefficient by the actual cumulative change

In the period from 1995 to 2009, the main triggers to the increase in household indebtedness in the EU countries are the rise of both financial asset prices and housing prices. In fact, households' indebtedness in the EU countries during that time would have been lower by about 14.3 and 10.5 per cent if there had not been an increase in both financial asset prices and

⁵ Please note that the results of the jack-knife analysis are available upon request.

housing prices, respectively. The fall in the interest rates and the rise in the personal income inequality were not sufficient to avoid the growth of households' indebtedness in the EU countries during that time. Effectively, household indebtedness in the EU countries at that time would have been even higher by around 85.2 if there had not been a fall in interest rates and by around 40.3 per cent if personal income inequality had not increased. From 2010 to 2019, the fall in the interest rates and the welfare state retrenchment were the main drivers in decreasing of household indebtedness in the EU countries during that time. In fact, both of them favoured a decline in household indebtedness in the EU countries by about 1313.2 per cent and 123.9 per cent, respectively. Over the full period as a whole, we conclude that the growth in household indebtedness in the EU countries was particularly boosted by the fall in the households' labour income and the rise in housing prices. In fact, the fall in the household labour income and the rise in housing prices sustained an increase in household indebtedness in the EU countries by around 30.0 and 12.9 per cent, respectively, during that time. The fall in the interest rates, the increase in the personal income inequality, the rise in the financial asset prices and the welfare state retrenchment were not enough to prevent the growth in household indebtedness in the EU countries during that time. In fact, it would have been even higher by around 597.7 per cent if there had not been a fall in interest rates, by about 33.3 per cent if personal income inequality had not increased, by around 5.9 per cent if financial asset prices had not risen, and by about 1.4 per cent if the welfare state had not retrenched.

7. CONCLUSION

This paper developed a panel data econometric analysis in order to determine the main macroeconomic causes of household indebtedness in all the EU countries from 1995 to 2019.

Mainstream economics, based on the life-cycle and permanent income theories of consumption (Modigliani and Brumberg, 1954; Friedman, 1957; Ando and Modigliani, 1963), does not offer a reliable interpretation of the unprecedented and unsustainable levels of household indebtedness reached in recent years, particularly up to the Great Recession (Cynamon and Fazzari, 2008; Palley, 2010).

Accordingly, Moore and Stockhammer (2018), by falling back mainly on non-mainstream interpretations and different strands of literature, find eight macroeconomic causes of household indebtedness, namely the growth of housing prices, the increase in financial asset prices, the rise in personal income inequality, the fall of households' labour income, the welfare state retrenchment, the rise in the working-age population, the decreasing trend in interest rates and the greater availability of credit.

Some of these eight interpretations have already been addressed in several empirical studies (Chrystal and Mizen, 2005; Kohn and Dynan, 2007; Oikarinen, 2009; Gimeno and Martinez-Carrascal, 2010; Valverde and Fernandez, 2010; Anundsen and Jansen, 2013; Meng et al., 2013; Rubaszek and Serwa, 2014; Klein, 2015; Malinen, 2016; Moore and Stockhammer, 2018; Stockhammer and Wildauer, 2018; and Romão and Barradas, 2021), but none of them have taken into account all of these interpretations simultaneously.

We estimated a model according to which the household indebtedness in the EU countries depends on housing prices, financial asset prices, personal income inequality, household labour income, welfare state expenditures, the working-age population and interest rates. As is the case in the majority of empirical studies around household indebtedness, the macroeconomic cause linked to the greater availability of credit was omitted due to data availability. Our model was estimated using the FE2SLS estimator in order to take into account the heterogeneity across the EU countries and to contour the potential problem of endogeneity that arises when a relevant variable is omitted (Greene, 2003; Wooldridge, 2003).

Our empirical findings reveal that housing prices, welfare state expenditures and interest rates impact positively on household indebtedness in the EU countries, whilst the financial asset prices, personal income inequality and households' labour income impact negatively on it. This confirms that these macroeconomic causes are important drivers of household indebtedness in the EU countries, although their effects vary across time and, particularly, across the trend in the evolution of household indebtedness in the EU countries. From 1995 to 2009, the rise in both financial asset prices and housing prices were the main triggers of the increasing trend of household indebtedness in the EU countries. From 2010 to 2019, the decline in the interest rates and the welfare state retrenchment were the main triggers of the decrease in the household indebtedness in the EU countries. Over the full period as a whole, the fall in the households'

Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

labour income and the rise in housing prices were the main triggers of the household indebtedness in the EU countries.

Our empirical findings provide very important insights for policymakers on the adoption of several measures to support the progressive reduction of household indebtedness in the EU countries, which involves essentially the need to restrain the rise in housing prices and financial asset prices and to contain the fall in households' labour income. Central banks should act in order to avoid the formation of bubbles in the housing market and in the stock markets, namely by preventing the maintenance of low interest rates that feeds more financial speculation. A monetary policy more focused on full employment goals could be desirable, because the increasing importance of low inflation goals using inflation targeting policies has proved to be insufficient to circumvent the trade-off between curtailing financial speculation and sustaining the economic growth (Palley, 2007). In this respect, a regulatory framework based on asset-based reserve requirements could be promising (Palley, 2007; Hein, 2012). Governments should act in order to revert the trend of decreasing households labour income by impairing the progressive deregulation and flexibilization of labour markets at the level of unemployment benefits, employment protection, employment rights and minimum wage (Barradas and Lagoa, 2017). The recovery of the general workers' bargaining power could be desirable, for instance by promoting more collective bargaining (e.g. among public servants) and by reinforcing the role of trade unions and/or workers commissions on the board of directors of the majority of corporations.

Further research on household indebtedness in the EU countries should address the role of these eight macroeconomic causes across the several types of household indebtedness, not only with regards to the respective purpose (e.g. housing credit, consumer credit, credit cards and overdraft banking accounts), but also in relation to the corresponding maturity (e.g. short-term credit, medium-term credit and long-term credit). Another suggestion could be the analysis at the household-level, by using micro data, which would allow addressing the role of these eight macroeconomic causes across households' characteristics (e.g. dimension, age, qualifications, occupation, and social stratum).

8. REFERENCES

- Ando, A. and Modigliani, F. 1963. 'The "Life Cycle" Hypothesis of Saving: Aggregate Implications and Tests'. *American Economic Review*. 53 (1): 55-84.
- Anundsen, A. K. and Jansen, E. S. 2013. 'Self-reinforcing effects between housing prices and credit'. *Journal of Housing Economics*. 22 (3): 192-212.
- Barba, A. and Pivetti, M. 2008. 'Rising household debt: Its causes and macroeconomic implications – a long-period analysis'. *Cambridge Journal of Economics*. 33 (1): 113-137.
- Barradas, R. 2016. 'Evolution of the Financial Sector – Three Different Stages: Repression, Development and Financialisation'. In *Advances in Applied Business Research: the L.A.B.S. Initiative*. Gomes, O. and Martins, H. F. (ed.): New York: Nova Science Publishers.
- Barradas, R. 2019. 'Financialization and Neoliberalism and the Fall in the Labor Share: A Panel Data Econometric Analysis for the European Union Countries'. *Review of Radical Political Economics*. 51 (3): 383-417.
- Barradas, R. and Lagoa, S. 2017. 'Functional Income Distribution in Portugal: The Role of Financialisation and Other Related Determinants'. *Society and Economy*. 39 (2): 183-212.
- Barradas, R., Lagoa, S., Leão, E. and Mamede, R. P. 2018. 'Financialisation in the European Periphery and the Sovereign Debt Crisis: The Portuguese Case'. *Journal of Economic Issues*. 52 (4): 1056-1083.
- Bernanke, B., Gertler, M. and Gilchrist, S., 1996. 'The Financial Accelerator and the Flight to Quality'. *The Review of Economics and Statistics*. 78 (1): 1-15.
- Boone, L. and Girouard, N. 2002. 'The Stock Market, The Housing Market and Consumer Behaviour'. *OECD Economic Studies* N° 35. Paris.
- Clarida, R., Galí, J. and Gertler, M. 1998. 'Monetary policy rules in practice: Some international evidence'. *European Economic Review*. 42 (6): 1033-1067.
- Cooper, D. and Dynan, K. 2016. 'Wealth Effects and Macroeconomic Dynamics'. *Journal of Economic Surveys*. 30 (1): 34-55.

- Chrystal, K. and Mizen, P. 2005. 'A Dynamic Model of Money, Credit, and Consumption: A Joint Model for the UK Household Sector'. *Journal of Money Credit and Banking*. 37 (1): 119-143.
- Cynamon, B. Z. and Fazzari, S. M. 2008. 'Household Debt in the Consumer Age: Source of Growth – Risk of Collapse'. *Capitalism and Society*. 3 (2): 1-32.
- Duesenberry, J. S. 1949. 'Income, Saving and the Theory of Consumer Behaviour'. Cambridge: Harvard University Press.
- Finlayson, A. 2009. 'Financialisation, Financial Literacy and Asset-Based Welfare'. *The British Journal of Politics & International Relations*. 11 (3): 400-421.
- Frank, R. H., Levine, A. S. and Dijk, O. 2014. 'Expenditure Cascades'. *Review of Behavioral Economics*. 1 (1-2): 55-73.
- Friedman, M. 1957. 'A Theory of the Consumption Function'. Princeton: Princeton University Press.
- Jimeno, R. and Martinez-Carrascal, C. 2010. 'The relationship between house prices and house purchase loans: The Spanish case'. *Journal of Banking & Finance*. 34 (8): 1849-1855.
- Greene, W. H. 2003. 'Econometric Analysis'. 5th Edition. Prentice-Hall: New York University.
- Godley, W., and Lavoie, M. 2007. 'Monetary Economics'. New York: Palgrave Macmillan.
- Hansen, L. 1982. 'Large Sample Properties of Generalized Method of Moments Estimators'. *Econometrica*. 50 (4): 1029-1054.
- Hein, E. 2012. 'The Macroeconomics of Finance-dominated Capitalism – and its Crisis'. Cheltenham: Edward Elgar Publishing Limited.
- Homburg, S. 2000. 'Compulsory savings in the welfare state'. *Journal of Public Economics*. 77 (2): 233-239.
- Kim, Y. K., Setterfield, M., and Mei, Y. 2015. 'Aggregate consumption and debt accumulation: an empirical examination of US household behaviour'. *Cambridge Journal of Economics*. 39 (1): 93-112.

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

- Klein, M. 2015. 'Inequality and household debt: a panel cointegration analysis'. *Empirica*. 42 (2): 391-412.
- Kohn, D. and Dynan, K. 2007. 'The Rise in U.S. Household Indebtedness: Causes and Consequences'. *The Structure and Resilience of the Financial System. Proceeding of a Conference*. Sydney: Reserve Bank of Australia.
- Lapavitsas, C. 2013. 'Profiting without Producing. How Finance Exploits Us All'. London: Verso.
- Ludwig, A. and Sløk, T. 2002. 'The Impact of Changes in Stock Prices and House Prices on Consumption in OECD Countries'. *IMF Working Paper N° 1*, Washington.
- Malinen, T. 2016. 'Does income inequality contribute to credit cycles?'. *The Journal of Economic Inequality*. 14 (3): 309-325.
- McCloskey, D. N. and Ziliak, S. T. 1996. 'The Standard Error of Regressions'. *Journal of Economic Literature*. 34 (1): 97-114.
- Meng, X., Hoang, N. T. and Siriwardana, M. 2013. 'The determinants of Australian household debt: A macro level Sstudy'. *Journal of Asian Economics*. 29: 80-90.
- Mian, A.; and Sufi, A. 2014. 'House of Debt: How They (and You) Caused the Great Recession, and How We Can Prevent It from Happening Again'. Chicago: University of Chicago Press.
- Modigliani, F.; and Brumbergh, R. 1954. 'Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data'. In *Post Keynesian Economics*. Kurihara, K. (ed.): New Brunswick: Rutgers University Press.
- Moore, G. L.; and 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.
- Oikarinen, E. 2009. 'Interaction between housing prices and household borrowing: The Finnish case'. *Journal of Banking & Finance*. 33 (4): 747-756.

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

- Palley, T.I. 2007. 'Financialisation: What it is and Why it Matters'. PERI Working Paper N° 153, Washington: Political Economy Research Institute.
- Palley, T. I. 2010. 'The Relative Permanent Income Theory of Consumption: A Synthetic Keynes-Duesenberry-Friedman Model'. *Review of Political Economy*. 22 (1): 41-56.
- Pardo, G. P. and Santos, J. M. S. 2014. 'Household Debt and Consumption Inequality: The Spanish Case'. *Economies*. 2 (3): 147-170.
- Romão, A. and Barradas, R. 2021. 'Macroeconomic Determinants of Households' Indebtedness in Portugal: What Really Matters in the Era of Financialisation?'. *Dinâmia*'CET-IUL Working Paper N° 2020/06, Lisbon.
- Rubaszek, M. and Serwa, D. 2014. 'Determinants of credit to households: an approach using the life-cycle model'. *Economic Systems*. 38 (4): 572-587.
- Ryoo, S. 2016. 'Household debt and housing bubbles: a Minskian approach to boom-bust cycles'. *Journal of Evolutionary Economics*. 26 (5): 971-1006.
- Stockhammer, E. 2009. 'The finance-dominated accumulation regime, income distribution and the present crisis'. *Papeles de Europa*. 19 (2009): 58-81.
- Stockhammer, E. 2012. 'Financialisation, Income Distribution and The Crisis'. *Investigación Económica*. 71 (279): 39-70.
- Stockhammer, E. 2015. 'Rising inequality as a cause of the present crisis'. *Cambridge Journal of Economics*. 39 (3): 935-958.
- Stockhammer, E. and Kohler, K. 2019. 'Financialisation and demand regimes in advanced economies'. Working Paper N° 1911, Post Keynesian Economics Society.
- Stockhammer, E. and Wildauer, R. 2018. 'Expenditure Cascades, Low Interest Rates or Property Booms? Determinants of Household Debt in OECD Countries'. *Review of Behavioral Economics*. 5 (2): 85-121.
- Taylor, J. B. 2009. 'The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong'. NBER Working Paper N° 14631.

Household indebtedness in the European Union countries:
Going beyond the mainstream interpretation

Tridico, P; and Pariboni, R. 2018. Inequality, financialization, and economic decline. *Journal of Post Keynesian Economics*. 41 (2): 236-259.

Valverde, C. and Fernandez, F. 2010. ‘The Relationship between Mortgage Markets and House Prices: Does Financial Instability Make the Difference?’. *CenFIS Working Paper 10–02*.

Van Der Zwan, N. 2014. ‘Making sense of financialization’. *Socio-Economic Review*. 12 (1): 99-129.

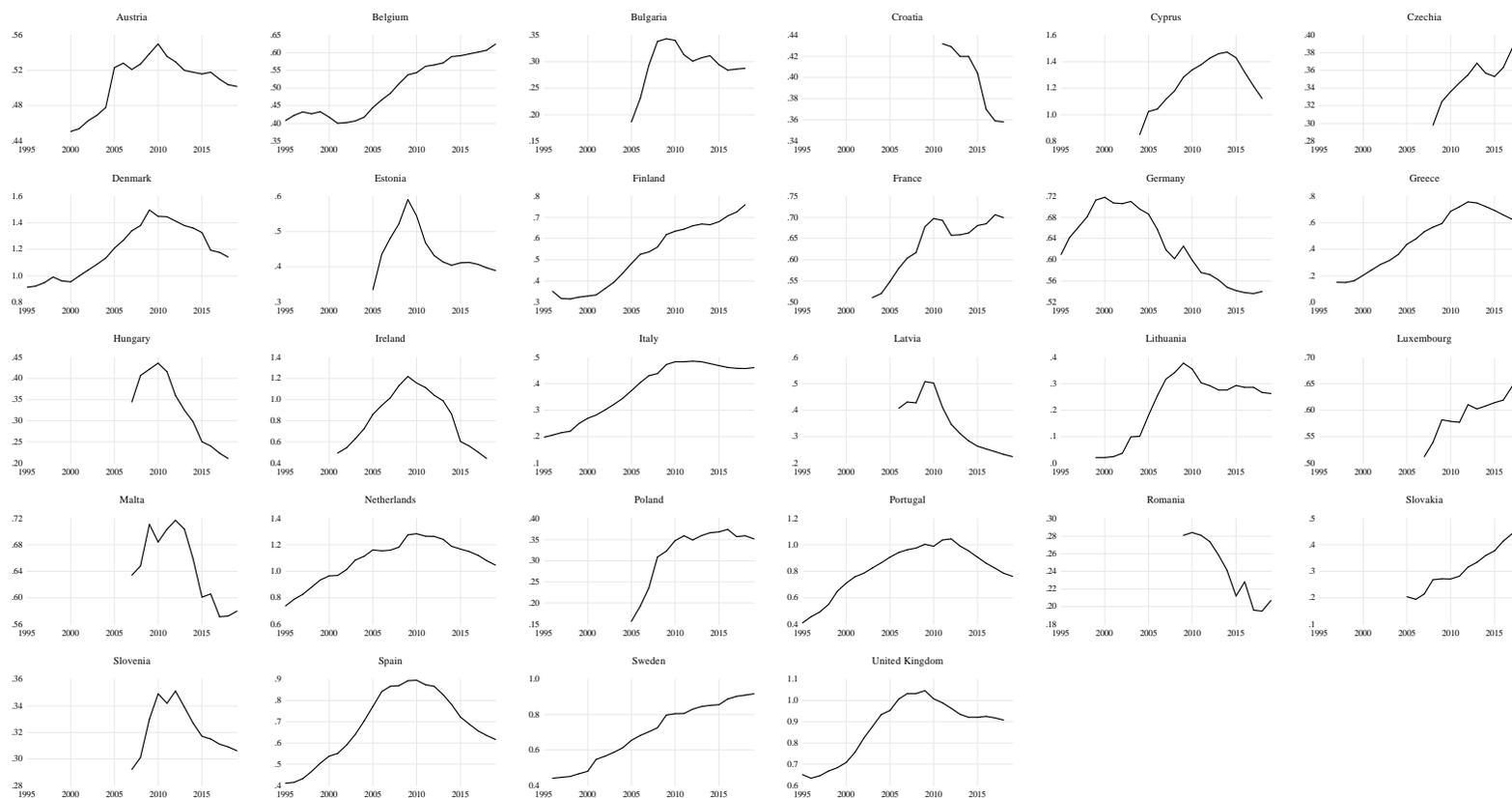
Wooldridge, J. M. 2003. *Introductory Econometrics: A Modern Approach*. 2nd Edition. Ohio: Thomson South-Western.

Ziliak, S. T. and McCloskey, D. N. 2004. ‘Size matters: the standard error of regressions in the American Economic Review’. *The Journal of Socio-Economics*. 33 (5): 527-54.

Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

9. APPENDIX

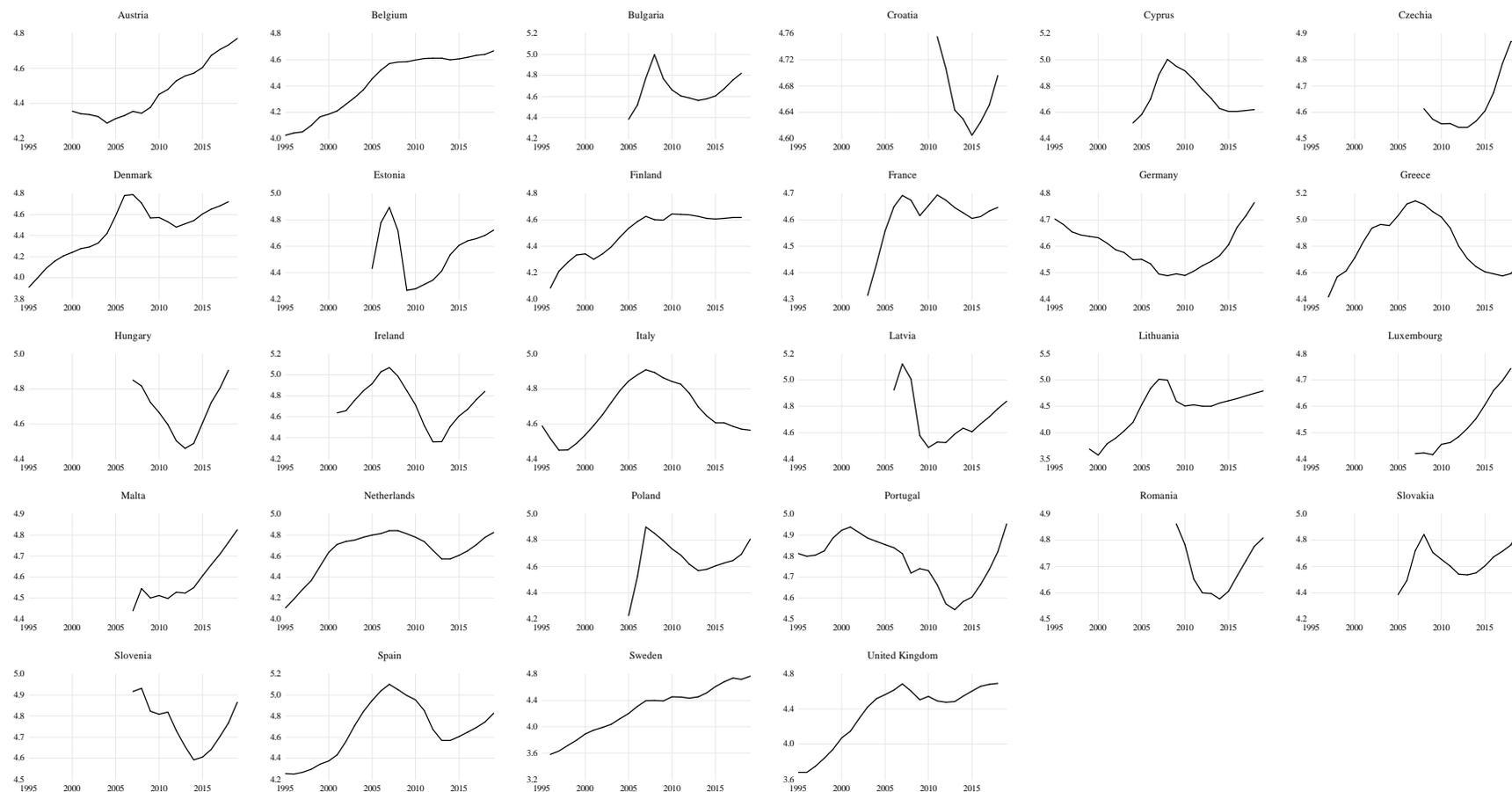
Figure A1. Households' indebtedness (% of gross domestic product)



DINÂMIA' CET – Iscte, Instituto Universitário de Lisboa (ISCTE-IUL)
Sala 2W4 - D | ISCTE-IUL – Av. das Forças Armadas
1649-026 Lisboa, PORTUGAL
Tel. (+351) 210 464 031 / 210 464 197 | E-mail: dinamia@iscte-iul.pt | www.dinamiacet.iscte-iul.pt

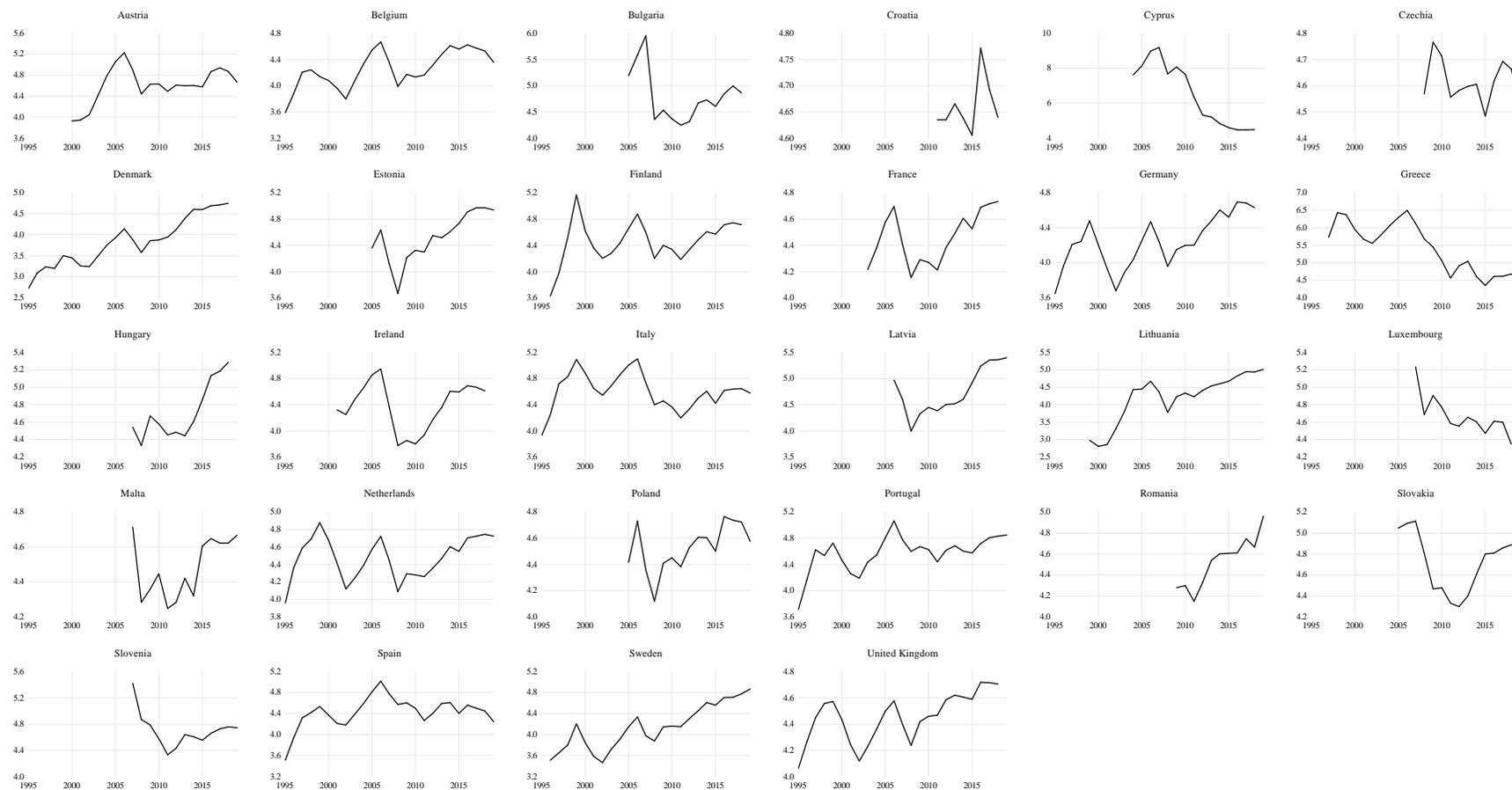
Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A2. Housing prices (natural logarithm)



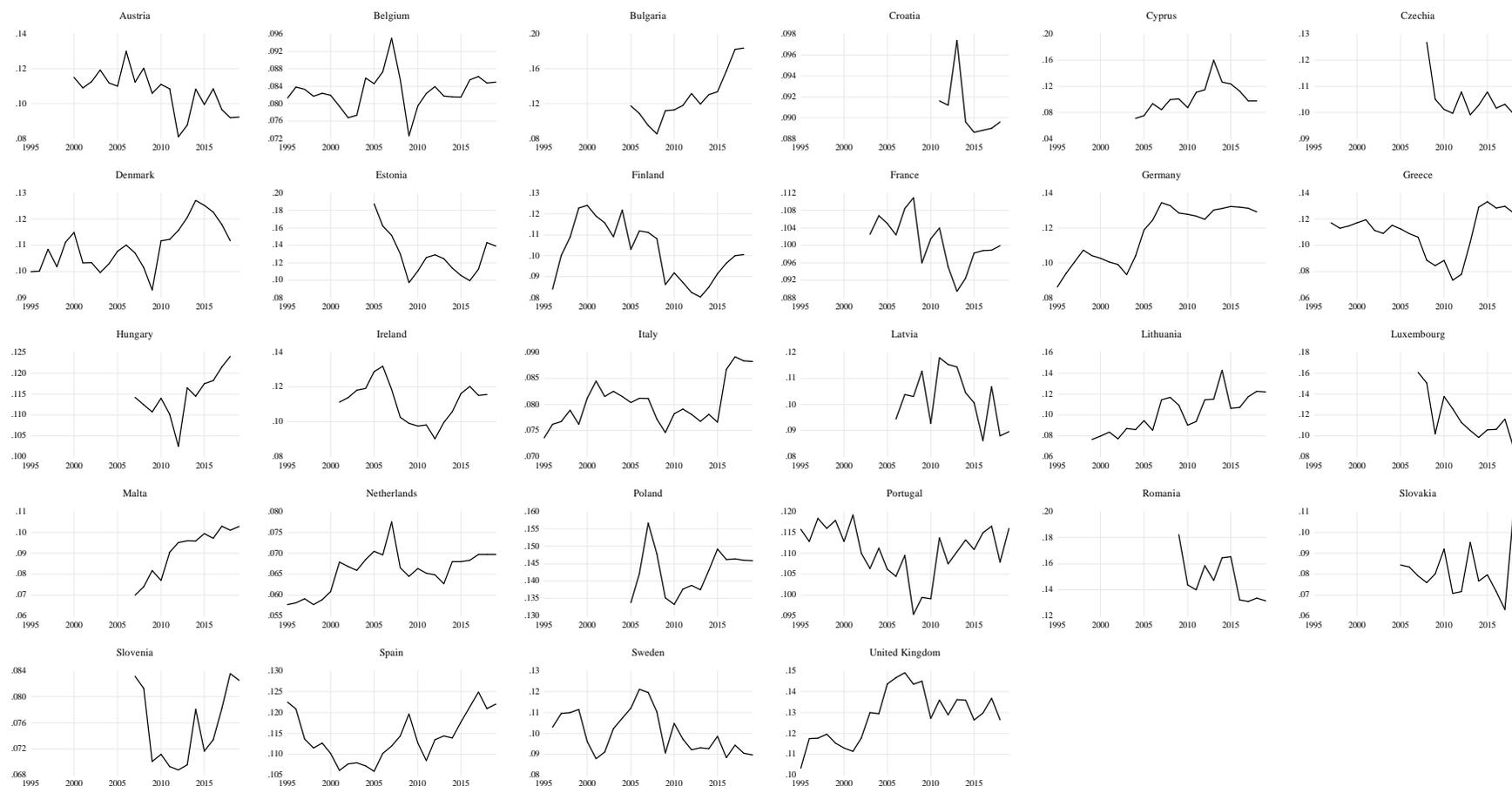
Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A3. Financial asset prices (natural logarithm)



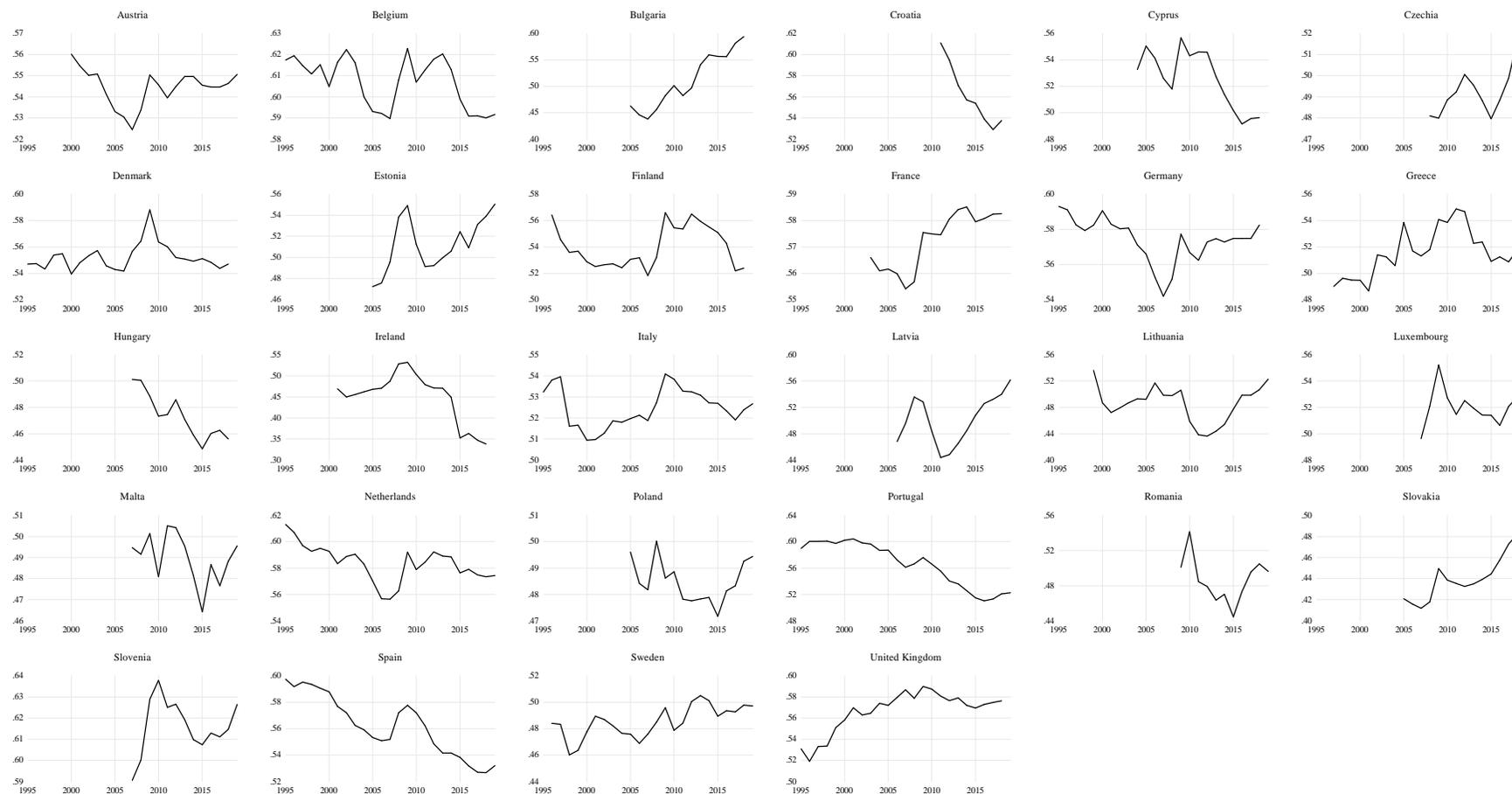
Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A4. Personal income inequality (% of total)



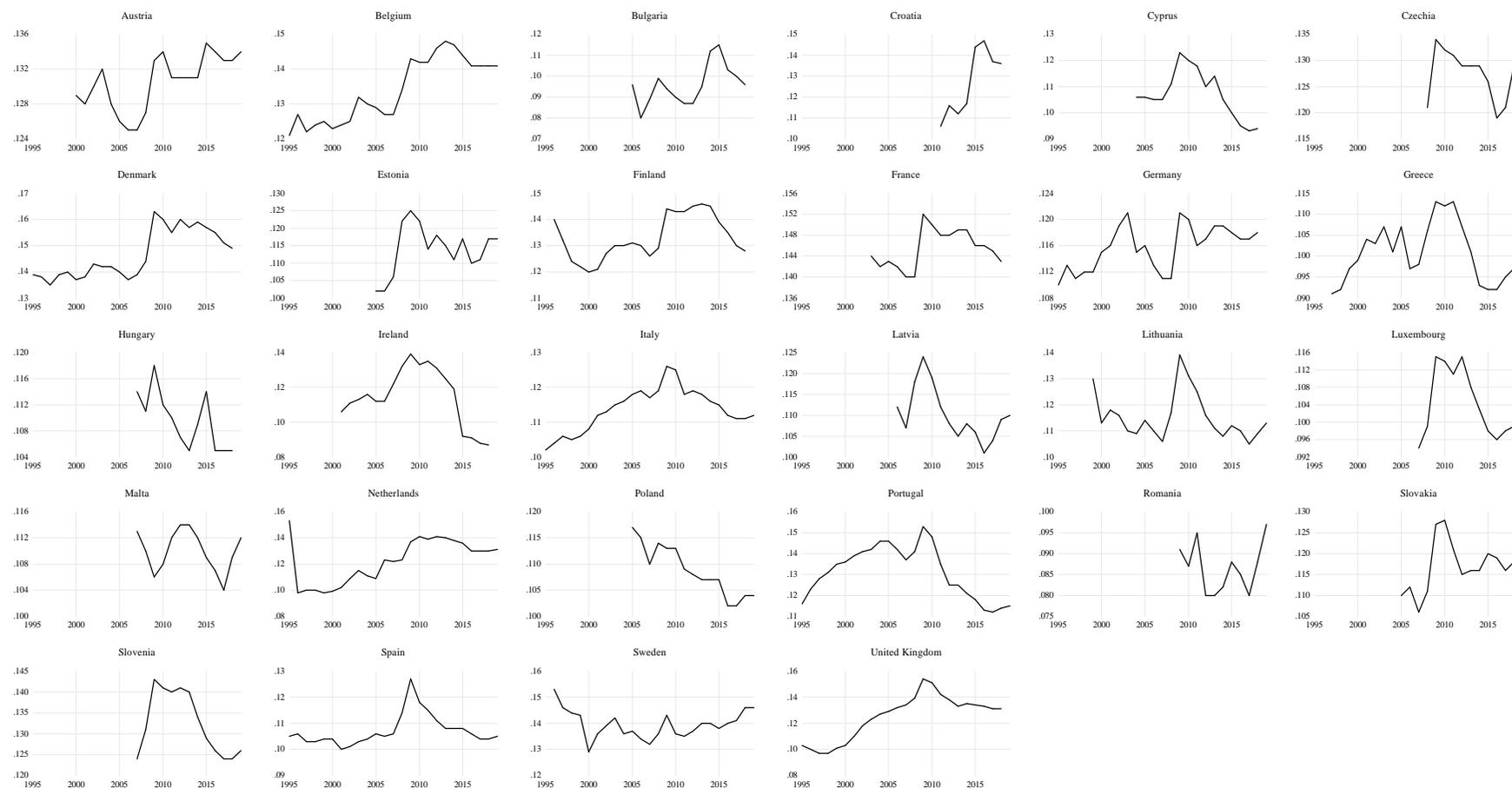
Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A5. Households' labour income (% of gross domestic product)



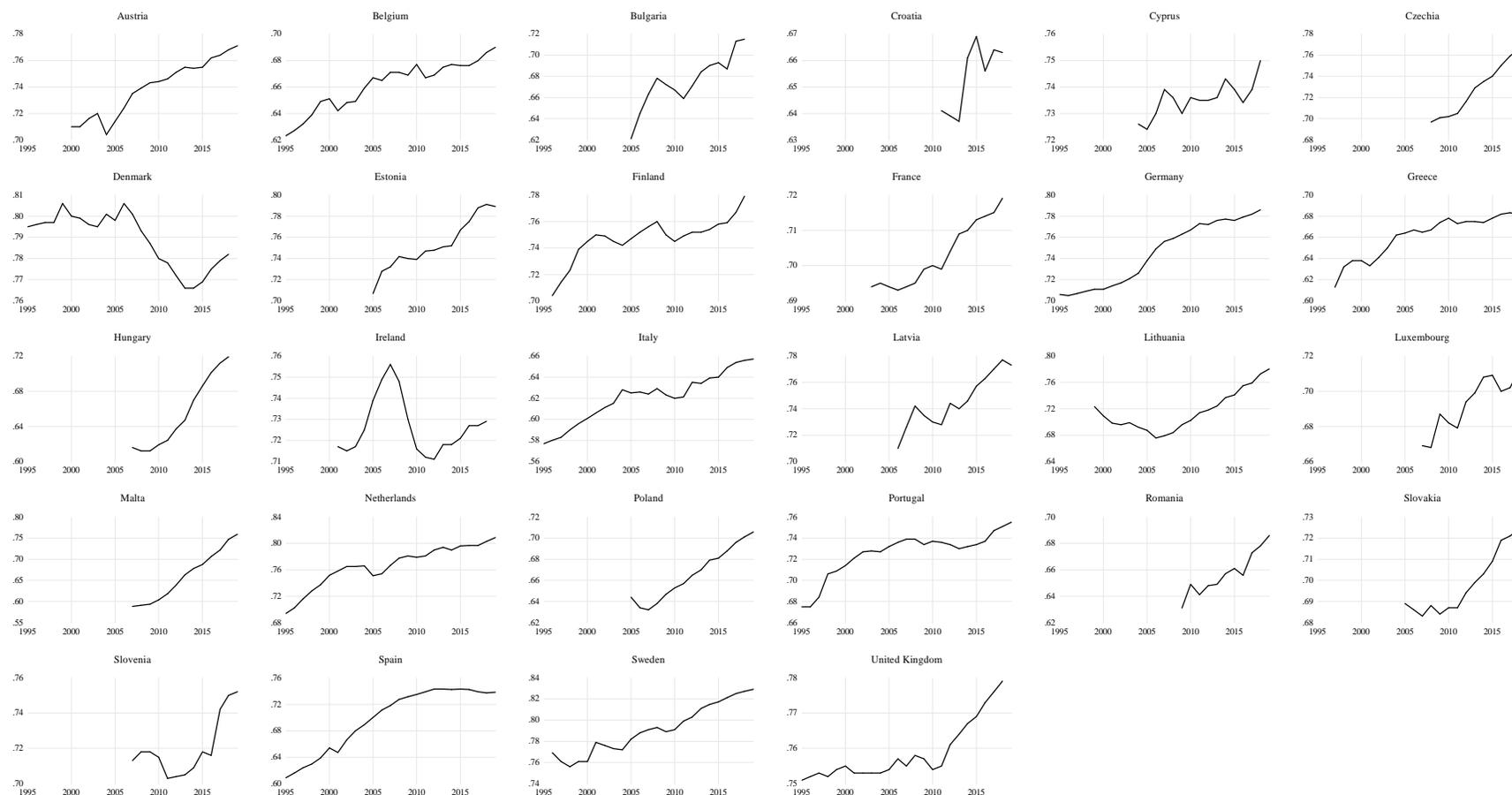
Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A6. Welfare state expenditures (% of gross domestic product)



Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A7. Working-age population (% of the total population between 15 and 64 years)



Household indebtedness in the European Union countries: Going beyond the mainstream interpretation

Figure A8. Interest rates (%)

