WHY DOES THE NEXUS BETWEEN FINANCE AND INCOME INEQUALITY BREAK IN TIMES OF FINANCIALISATION? EMPIRICAL EVIDENCE FOR THE EUROPEAN UNION COUNTRIES

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Purpose

This paper aims to contribute to the current debate between the mainstream and the non-mainstream literature on the effect of the growth of finance on the level of income inequality, for which the empirical evidence has also been providing mixed results.

Design/methodology/approach

We estimate a linear model and a non-linear model by employing a panel autoregressive distributed lag approach and relying on the dynamic fixed-effects estimator because of the existence of variables that are stationary in levels and stationary in the first differences.

Findings

Our findings confirm that finance, economic growth, educational attainment and degree of trade openness have a positive long-term effect on the level of income inequality in the European Union countries, whilst government spending has a negative impact in the short term.

Originality

To the best of our knowledge, this is the first paper that, simultaneously, focuses on the European Union countries, assesses the nexus between finance and income inequality, uses three different variables as proxies for the level of income inequality (the Gini coefficient, the top 1% income share and the top 10% income share), measures the variables that are proxies for the level of income inequality in terms of pre-tax and pre-transfer values and as post-tax and post-transfer values, takes into account four different variables as proxies for the role of finance (credit, credit-to-deposit ratio, liquid liabilities and stock market capitalisation) and identifies the long-term and short-term determinants of income inequality.

Research limitations/implications

Our findings imply that policy makers should rethink the functioning of the financial system in order to restore a supportive relationship between finance and income inequality and adopt public policies that are more in favour of the poor in order to constrain the growth of income inequality in the European Union countries.

Keywords

Financialisation, Income Inequality, European Union, Panel Autoregressive Distributed Lag, Dynamic Fixed-Effects Estimator

JEL Classification

C23, D31, D63 and E44

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1. INTRODUCTION

Income inequality has remained at very high levels all over the world (Piketty, 2014; Haan and Sturm, 2017; Bolarinwa *et al.*, 2021), which could represent several deleterious effects, such as: the spread of destitution, criminality, corruption, injustice, insider privilege, unequal opportunities and social-political unrest (Tan and Law, 2012); hunger, poor health and a fall in life expectancy at birth (Claessens and Perotti, 2007; Bolarinwa *et al.*, 2021); the rise of abstentions in elections, the proliferation of populism, the emergence of more extreme political parties, the recurrence of more defragmented parliaments and the absence of political majorities and, consequently, less political stability (Stoetzer *et al.*, 2023); the growth of the informal sector (Claessens and Perotti, 2007); a decrease in entrepreneurial activities and consequent harmful effects on labour productivity and on productive investment (Claessens and Perotti, 2007); weak economic growth and an increase in unemployment, due to higher levels of taxation to implement public policies to mitigate income inequality (Seven and Coskun, 2016); the recurrence of episodes of financial and economic crisis due to the greater indebtedness of poorer people as a way to overcome their stagnant wages and maintain their consumption standards (Romão and Barradas, 2022); and even climate change (Roberts, 2001).

Moreover, income inequality tends to exhibit a strong persistence over time (Barradas and Lakhani, 2023), due to the transmission through families of both wealth and ability, the imperfections of the financial markets, geographical or local segregation and self-fulfilling beliefs (Piketty, 2000). This requires the adoption of various public policies that could be inequality-constraining, and imposes the need to gain a better understanding of the role played by the financial system on the level of income inequality, particularly because of the contradictory views between the mainstream literature and the non-mainstream literature, for which the empirical evidence has also provided mixed results (Khatatbeh and Moosa, 2022).

This paper aims to contribute to that debate and extends the existing literature by offering at least six different contributions. To the best of our knowledge, this is the first paper that, simultaneously, applies the following six aspects. First, it focuses on the European Union (EU) countries. Second, it assesses the nexus between finance and income inequality. Third, it employs three different variables as proxies for the level of income inequality (the Gini coefficient, the top 1% income share and the top 10% income share). Fourth, it measures the variables that are proxies for the level of income inequality in terms of pre-tax and pre-transfer values and as post-tax and post-transfer values. Fifth, it uses four different variables as proxies for the role of finance (credit, credit-to-deposit ratio, liquid liabilities and stock market capitalisation). Sixth, it assesses the long-term and short-term determinants of income inequality.

We estimate a linear model and a non-linear model by employing a panel autoregressive distributed lag approach and relying on the dynamic fixed-effects (DFE) estimator because of the existence of variables that are stationary in levels and stationary in the first differences (Pesaran and Smith, 1995; Pesaran, 1997; Pesaran *et al*., 1997, 1999). Our findings confirm that finance, economic growth, educational attainment and degree of trade openness exert a positive long-term effect on the level of income inequality in the EU countries, whilst government spending has a negative impact in the short term. All of these findings are robust to the different proxies chosen. Our findings imply that policy makers should rethink the functioning of the financial system to make it more supportive of greater income equality and adopt more public policies that favour the poor in order to constrain the widening of income inequality in the EU countries.

This paper is organised as follows. In Section 2, we provide the theoretical and empirical evidence on the nexus between finance and income inequality in times of financialisation. Section 3 presents the linear model and the non-linear model to estimate the level of income inequality, and derives the respective hypotheses. In Section 4, we describe the dataset. Section 5 explains the economic framework that is employed to produce the estimates. The empirical findings are presented and discussed in Section 6. Section 7 concludes, presents the main policy implications and suggests further research.

2. THE NEXUS BETWEEN FINANCE AND INCOME INEQUALITY IN TIMES OF FINANCIALISATION: THEORETICAL AND EMPIRICAL EVIDENCE

It is widely acknowledged that the majority of policy makers in the more developed economies have been promoting a strong process of liberalisation, deregulation and privatisation of the financial system since the 1970s and 1980s as an excuse to curb financial repression, to boost the growth of finance and the consequent financial development, to stimulate economic growth and to narrow income inequality (Barradas, 2016; Barradas and Lakhani, 2023). This strategy has clearly been fostered by the conventional economic theory about the beneficial role of the financial system in promoting an acceleration of economic growth and a reduction of income inequality, for which there has been strong empirical evidence.

On the theoretical side, the growth of finance tends to be growth-enhancing, which suggests that income inequality fades because information and transaction costs, which are particularly detrimental for the poor, are reduced (Jalilian and Kirkpatrick, 2002; Beck *et al*., 2007; Seven and Coskun, 2016). This view rests on the seminal work of Kuznets (1955), according to which there is a concave quadratic (non-linear) relationship between growth and income inequality (i.e., the so-called Kuznets curve), which sustains the idea that economic growth has an inverted U-shaped effect on income inequality and that economic growth only negatively affects income inequality after reaching a certain threshold. Also on the theoretical side, the growth of finance tends to constrain income inequality by allowing the reduction of credit constraints and transaction costs, which improves the access of poorer people to financial services and, therefore, attenuates income inequality (Greenwood and Jovanovic, 1990).

On the empirical side, we can identify several econometric works that support the beneficial effect of finance on economic growth and on income inequality. Li *et al*. (1998), Das and Mohapatra (2003), Clarke *et al*. (2006), Beck *et al*. (2007), Gimet and Lagoarde-Segot (2011), Hamori and Hashiguchi (2012), Li and Yu (2014), Rashid and Intarglia (2017), Rewilak (2017), Meniago and Asongu (2018), Jung and Vijverberg (2019) and Thornton and Di Tommaso (2019) report a negative (linear) relationship between finance and income inequality. Kim and Lin (2011), Law *et al*. (2014) and Chiu and Lee (2019) report a concave quadratic (non-linear) relationship between finance and income inequality that confirms that finance has an inverted U-shaped effect on income inequality and that finance only negatively affects income inequality after reaching a certain threshold.

Nonetheless, economic growth has been quite anaemic in the majority of the developed countries (Barradas, 2020, 2022a), and income inequality has remained at very high levels in recent decades (Piketty, 2014; Haan and Sturm, 2017; Bolarinwa *et al*., 2021), which refutes the mainstream claims regarding the supportive role of the financial system and also clearly shows that the strategy around the liberalisation, deregulation and privatisation of the financial system since the 1970s and 1980s has been ineffective.

Effectively, the non-mainstream literature has successively highlighted that the growth of finance, a phenomenon that is commonly treated as financialisation, has been prejudicial in contemporary societies in recent decades by having many harmful effects on economies and on societies that arise from an excessive financial deepening that has occurred simultaneously with an environment of strong financial liberalisation and deregulation (Barradas, 2016).

This strand of the literature presents several explanations of why the nexus between finance and income inequality breaks in times of financialisation, namely by contributing to anaemic economic growth (Barradas, 2020, 2022a), by failing to provide democratised access to financial services for all people (Seven and Coskun, 2016), by favouring banking systems highly concentrated and with strong market power (Claessens and Perotti, 2007; Arora, 2012), by promoting more economic downturns and a consequent increase in unemployment (Seven and Coskun, 2016; Haan and Sturm, 2017), by feeding asset price booms (Lagoa and Barradas, 2021; Barradas, 2022b), by pushing down (up) the labour income (profit) share (Correia and Barradas, 2021; Gonçalves and Barradas, 2021; Barradas, 2019), by sustaining the flows related to foreign direct investment that are more detrimental to low-skilled and unskilled workers (Jaumotte *et al*., 2013) and by exacerbating the political power of the financial elites and the consequent adoption of various public policies and practices that favour the rich (Lagoa and Barradas, 2021).

From an empirical point of view, we can identify several econometric works that confirm the detrimental role played by finance in relation to economic growth and income inequality, supporting beliefs in the presence of a new 'secular stagnation' (Barradas, 2022a) and a trend of persistent income inequality in times of financialisation (Piketty, 2014). Liang (2006), Motonishi (2006), Tan and Law (2009), Rodrigues-Pose and Tselios (2009), Roine *et al*. (2009), Ang (2010), Kus (2012), Jaumotte *et al*. (2013), Jauch and Watzka (2015, 2016), Sehrawat and Giri (2015), Seven and Coskun (2016), Haan and Sturm (2017), Altunbas and Thornton (2018), Khatatbeh and Moosa, 2022, and Barradas and Lakhani (2023) report a positive (linear) relationship between finance and income inequality. Tan and Law (2012) and Barradas and Lakhani (2023) report a convex quadratic (non-linear) relationship between finance and income inequality, which confirms that finance has a U-shaped effect on income inequality and that finance only positively affects income inequality after reaching a certain threshold.

This paper aims to contribute to the current debate between the mainstream and the non-mainstream literature on the role played by the growth of finance on the level of income inequality by performing a panel data econometric analysis for all the EU countries from 1980 to 2019.

3. LINEAR AND NON-LINEAR MODELS AND HYPOTHESES

Our long-term models to assess the nexus between finance and income inequality in all the EU countries take the following forms:

$$I_{i,t} = \beta_0 + \beta_1 F_{i,t} + \beta_2 X_{i,t} + \alpha_{i,t} \quad \textbf{(1)}$$

$$I_{i,t} = \beta_0 + \beta_1 F_{i,t} + \beta_2 F_{i,t}^2 + \beta_3 X_{i,t} + \alpha_{i,t} \quad \textbf{(2)}$$

where i is the country, t is the time period (year), I is the level of income inequality, F is the proxy to assess the role of finance, X is a set of control variables that have been shown both theoretically and empirically to be important determinants of income inequality, and α is the two-way error term component to take into account unobservable country-specific and time-specific effects.

The first model aims to take into account a positive (linear) or a negative (linear) relationship between finance and income inequality, and the second model aims to consider a concave quadratic (non-linear) or a convex quadratic (non-linear) relationship between finance and income inequality. As discussed previously, finance has been strongly inequality-enhancing in times of financialisation, which means that finance should exert a positive linear effect on income inequality in the first model and a convex quadratic effect on income inequality in the second model. This expected U-shaped relationship between finance and income inequality in the second model implies that finance should exert a negative effect on income inequality and that its squared term should exert a positive effect on income inequality. This is used to define the respective threshold (minimum) of the expected convex quadratic function, according to which the relationship between finance and income inequality is negative up to this threshold and positive after that. The estimated coefficients are used to define the respective threshold – F^* – through the following formula:

$$\left(\beta_1 F_{i,t} + \beta_2 F_{i,t}^2\right)' = 0 \Leftrightarrow \beta_1 + 2\beta_2 F^* = 0 \Leftrightarrow F^* = \frac{-\beta_1}{2\beta_2} \quad \textbf{(3)}$$

As in the empirical works of Das and Mohapatra (2003), Beck *et al*. (2007), Kim and Lin (2011), Li and Yu (2014), Seven and Coskun (2016), Haan and Sturm (2017), Rashid and Intarglia (2017), Rewilak (2017), Altunbas and Thornton (2018), Bolarinwa *et al*. (2021), Lee and Siddique (2021) and Barradas and Lakhani (2023), we use the growth rate of the GDP per capita, the square of the growth rate of the GDP per capita, the inflation rate, the educational attainment, the government spending and the degree of trade openness as control (independent) variables in our two models.

We include the growth rate of the GDP per capita and its square because of the theoretical predictions of the aforementioned Kuznets curve, according to which economic growth should exert a concave quadratic effect on income inequality (Kuznets, 1955). This expected inverted U-shaped relationship between economic growth and income inequality implies that the growth rate of the GDP per capita should have a positive effect on income inequality and its square term should have a negative effect on income inequality. This is used to define the threshold (maximum) of the expected concave quadratic function, according to which the relationship between economic growth and income inequality is positive up to this threshold and negative after it. The estimated coefficients are used to define the respective threshold – EG^* – through the following formula:

$$\left(\beta_3 EG_{i,t} + \beta_4 EG_{i,t}^2\right)' = 0 \Leftrightarrow \beta_3 + 2\beta_4 EG^* = 0 \Leftrightarrow EG^* = \frac{-\beta_3}{2\beta_4} \quad \textbf{(4)}$$

The inflation rate is included in order to control for the macroeconomic environment (Beck *et al*., 2007). As postulated by Kim and Lin (2011) and Meniago and Asongu (2018), the inflation rate should have a positive impact on income inequality because high-inflation episodes are more detrimental for the poor because they lose relatively more purchasing power, have more difficult to access financial instruments to hedge against inflation and hold more cash.

We include educational attainment in order to control for the accumulation of human capital, which should exert a negative influence on income inequality for two different reasons (Kim and Lin, 2011), namely through the smaller gap in the wages received by skilled and unskilled workers and the rise in the demand for skilled workers to incorporate new technologies into the production process.

Government spending is included among our independent variables in order to take into account its redistributive function through the tax system and social benefits towards the poor, the provision of public goods and the welfare state intervention, which should have a negative impact on income inequality (Kim and Lin, 2011; Bolarinwa *et al*., 2021).

Income inequality should depend positively on the degree of trade openness, according to the Heckscher–Ohlin–Samuelson theory (Kim and Lin, 2011; Bolarinwa *et al*., 2021). Effectively, this theory postulates that greater trade openness fosters a rise in the returns from the abundant capital (labour) and/or skilled (unskilled) labour in more developed (developing) countries due to their greater specialisation in capital (labour) and/or skilled (unskilled) labour-intensive goods, which is inequality-enhancing (inequality-constraining) in developed (developing) countries because of the consequent increase (decrease) in the wage gap between skilled and unskilled workers in more developed (developing) countries.

4. DATASET

Our dataset is composed of annual data for all the EU countries from 1980 to 2019, which represents the period and the periodicity for which all data are available[1].

Three different variables are used as proxies for the level of income inequality, namely the Gini coefficient, the top 1% income share and the top 10% income share. As noted by Furceri and Lougani (2015) and Makhlouf *et al*. (2020), the Gini coefficient is used to take into account the overall distribution of income in the country, whilst the top income shares allow the isolation of the wealthy cohort in the country, who typically have other sources of income that are omitted in the Gini coefficient. These three variables are measured in terms of pre-tax and

[1] We include the United Kingdom in our panel dataset because our dataset is composed of annual data from 1980 to 2019 and Brexit only happened at the beginning of 2020.

pre-transfer values (i.e., gross values, with the aim of assessing income inequality before income redistribution) and post-tax and post-transfer values (i.e., net values, with the aim of assessing income inequality after income distribution), in order to assess the public intervention to mitigate income inequality (Makhlouf *et al*., 2020).

Because of the multifaceted way through which the growth of finance has expanded income inequality in times of financialisation, four different variables are used as proxies for the role of finance, namely credit, credit-to-deposit ratio, liquid liabilities and stock market capitalisation. As emphasised by Beck *et al*. (2014), Adeleye *et al*. (2017), Meniago and Asongu (2018), Bolarinwa *et al*. (2021) and Khatatbeh and Moosa (2022), these four variables are those that are commonly used in the majority of empirical works on the nexus between finance and income inequality, since they mirror the different aspects of finance (e.g., size, activity, depth, access, efficiency and stability) and the roles played by different financial intermediaries (e.g., banks and financial markets).

It is worth noting that the available data differ slightly according to the variable used as a proxy for the role of finance, and that for all of these variables there is not data available for all years for each country. Therefore, we build four unbalanced panels in order to maximise the number of observations and to minimise the number of missing values. Table A1 in the Appendix displays the structure and composition of our four unbalanced panels.

Table 1 describes the proxies, units and sources for each variable. Table A2 in the Appendix contains the descriptive statistics for each variable in each unbalanced panel. Table A3 in the Appendix includes the correlation matrices between all the variables in each unbalanced panel. Figures A1 to A15 in the Appendix show the plots for each variable.

Table 1 – The proxies, units and sources for each variable

Acronym	Variable	Proxy and Unit	Source
GG	Gross Gini	Gini coefficient, pre-tax national income (%)	World Inequality
NG	Net Gini	Gini coefficient, post-tax national income (%)	World Inequality
GT1	Gross top 1% income share	Top 1% income share, pre-tax national income (%)	World Inequality
NT1	Net top 1% income share	Top 1% income share, post-tax national income (%)	World Inequality
GT10	Gross top 10% income share	Top 10% income share, pre-tax national income (%)	World Inequality
NT10	Net top 10% income share	Top 10% income share, post-tax national income (%)	World Inequality
C	Credit	Domestic credit to the private sector (% of GDP)	The Global Inequality
CDR	Credit-to-Deposit Ratio	Bank credit (% of bank deposits)	The Global Inequality
LL	Liquid Liabilities	Liquid Liabilities (% of GDP)	The Global Inequality
SMC	Stock Market Capitalization	Stock market capitalization (% of GDP)	The Global Inequality[2]
EG	Economic Growth	GDP per capita growth (annual %)	World Bank
IR	Inflation Rate	Inflation, consumer prices (annual %)	World Bank
EA	Educational Attainment	School enrollment, secondary (% gross)	World Bank
GS	Government Spending	General government final consumption expenditure (% of GDP)	World Bank
TO	Trade Openness	Trade (% of GDP)	World Bank

All the correlations between all the variables in each unbalanced panel are less than 0.8 in absolute terms, which confirms that there is no multicollinearity among them (Studenmund, 2016). The only exceptions occur with the gross Gini, gross top 1% income share and gross top

[2] The stock market capitalization for Estonia, Latvia and Lithuania was collected from the Fred St. Louis database due to its unavailability on The Global Economy database.

10% income share variables because of the strong correlations among them. However, these variables are used separately from each other in order to avoid obtaining inefficient estimates (which could arise due to the existence of multicollinearity between the variables) and to assess the robustness of our estimates according to the proxy used.

Table A4 in the Appendix displays the recent Karavias and Tzavalis (2014) panel unit root test for all the variables in each panel[3]. This panel unit root test is the most appropriate for our panel datasets and produces reliable conclusions by allowing for one or two (known or unknown) structural breaks, intercepts and linear trends, non-normal errors, cross-sectional heteroskedasticity and cross-sectional dependence (Karavias and Tzavalis, 2014). In addition, this panel unit root test can be used in panels with small or large time-series dimensions and in both balanced and unbalanced panels (Karavias and Tzavalis, 2014). The results of this panel unit root test indicate that we are in the presence of panel datasets with a mixture of variables that are stationary in levels and stationary in the first differences.

5. ECONOMETRIC FRAMEWORK

We rely on the panel autoregressive distributed lag to produce our estimates, given that we have a mixture of variables that are stationary in levels and stationary in the first differences[4]. This econometric framework was introduced by Pesaran and Smith (1995), Pesaran (1997) and Pesaran *et al*. (1997, 1999), and employs an autoregressive distributed lag approach to dynamic heterogeneous panel data regressions in an error correction form by allowing the existence of both short-term and long-term effects and the inclusion of lags for both the dependent and the independent variables.

This econometric framework uses three different estimators, namely the mean-group (MG) estimator, the DFE estimator and the pooled mean-group (PMG) estimator. The MG estimator, developed by Pesaran and Smith (1995), allows the heterogeneity of all coefficients (long-term coefficients, short-term coefficients, intercepts, the error correction terms and the error variances) because it estimates individual regressions for each cross-sectional unit (country) in the panel dataset and, then, calculates group coefficients by the unweighted averaging of the coefficients for each individual country. According to these authors, this estimator produces consistent estimates (particularly in the case of larger panels) even in cases where endogeneity exists, because of the possibility of including lags for both the dependent

[3] The Karavias and Tzavalis (2014) panel unit root test was performed in the Stata software (version 17) using the 'xtbunitroot' command, which was developed by Chen *et al.* (2022).

[4] The panel autoregressive distributed lag estimator was performed in the Stata software (version 17) using the 'xtpmg' command, which was developed by Blackburne III and Frank (2007) and produces the estimates using a maximum likelihood method.

and the independent variables. The DFE estimator only supposes the heterogeneity of the intercepts, assuming the homogeneity of both the long-term and short-term coefficients, the error correction terms and the error variances among all the countries. According to Blackburne III and Frank (2007), this estimator produces consistent estimates, particularly in the case of identical intercepts among the cross-sectional units (countries). The PMG estimator, developed by Pesaran *et al*. (1997, 1999), assumes the homogeneity of the long-term coefficients among all the cross-sectional units (countries), but allows the heterogeneity of the short-term coefficients, the intercepts, the error correction terms and the error variances. Indeed, the PMG estimator represents an intermediate estimator between the MG estimator and the DFE estimator (Blackburne III and Frank, 2007). According to Pesaran *et al.* (1999), the PMG estimator also produces consistent estimates, although it tends to be more efficient than the MG estimator.

We use the conventional Hausman's (1978) specification test in order to determine the choice between the MG estimator, the DFE estimator and the PMG estimator in terms of efficiency and consistency[5]. Our estimates are produced using only one lag due to the use of annual data, to avoid losing too many degrees of freedom (Wooldridge, 2003), and to adhere to the indication provided by the information criteria[6]. This is the traditional strategy adopted in the majority of empirical works on the nexus between finance and inequality (Makhlouf *et al*., 2020).

6. EMPIRICAL FINDINGS AND DISCUSSION

Our empirical findings are presented and discussed throughout this Section. Table A5, Table A6 and Table A7 in the Appendix display the estimates for the linear models and for the pre-tax and pre-transfer values for income inequality. Table A8, Table A9 and Table A10 in the Appendix present the estimates for the linear models and for the post-tax and post-transfer values of income inequality. Table A11, Table A12 and Table A13 in the Appendix contain the estimates for the non-linear models and for the pre-tax and pre-transfer values of income inequality. Table A14, Table A15 and Table A16 in the Appendix exhibit the estimates for the non-linear models and for the post-tax and post-transfer values of income inequality. All of these estimates are produced using the DFE estimator, because the Hausman's (1978) specification test suggests that, for all models, the DFE estimator should be preferred over the

[5] The Hausman's (1978) specification test was performed in the Stata software (version 17) using the 'hausman' command.

[6] The results of the information criteria for each panel dataset are available upon request.

MG estimator and the PMG estimator in terms of efficiency and consistency[7]. This seems to suggest that there are no noteworthy differences among the EU countries with regard to the short-term and the long-term determinants of income inequality, namely because the DFE estimator assumes the homogeneity of both the short-term and the long-term coefficients, the error correction terms and the error variances among all the cross-sectional units (countries). This also suggests that the potential simultaneous equation bias from the endogeneity between the error term and the lagged dependent variable (Baltagi *et al*., 2000) is minimal in our models by contributing to reliable estimates (Blackburne III and Frank, 2007). Note that for all of these estimates the error correction term is statistically significant and exhibits a negative coefficient that lies between -2 and 0. This confirms that there is cointegration among our variables, that is, a long-term relationship between them. This also suggests the convergence of our models to the long-term equilibrium even when there is a shock in the short term. We confirm that our estimates are stable because no structural breaks were identified with the implementation of the CUSUM stability tests[8].

With regard to the linear models, our findings are quite robust, because our long-term and short-term estimates do not change dramatically in terms of statistical significance and signs of the coefficients when we use different variables as proxies for the level of income inequality and/or different variables as proxies for finance. In what follows, we discuss the long-term and short-term estimates for each independent variable in more detail.

We are able to report strong evidence that finance exerts a positive impact on levels of income inequality in the EU countries, particularly in the long term. This positive relationship between finance and income inequality is in line with the non-mainstream literature, reinforcing the idea that the growth of finance has been inequality-enhancing and confirming the results obtained by Liang (2006), Motonishi (2006), Rodrigues-Pose and Tselios (2009), Roine *et al.* (2009), Tan and Law (2009), Ang (2010), Kus (2012), Jaumotte *et al.* (2013), Jauch and Watzka (2015, 2016), Sehrawat and Giri (2015), Seven and Coskun (2016), Haan and Sturm (2017), Altunbas and Thornton (2018), Khatatbeh and Moosa (2022) and Barradas and Lakhani (2023). The positive relationship between finance and income inequality is stronger for the proxies of credit and stock market capitalisation. This seems to confirm that the growth of finance does not provide democratised access to credit for all people (Seven and Coskun, 2016) and only increases the leverage of richer ones (Makhlouf *et al*., 2020), which accelerates the rise of

[7] The only exception occurs in the non-linear model in which the net top 10% income share is used as a proxy for the level of income inequality and credit is used as a proxy for finance (Table A16 in the Appendix). Effectively, Hausman's test indicates that the DFE estimator is preferred over the MG estimator but that there are no differences in terms of efficiency and consistency between the DFE estimator and the PMG estimator. Here, we use the DFE estimator in order to obtain fully comparable results with the remaining estimates that employ the DFE estimator.

[8] The CUSUM stability tests were performed in the Stata software (version 17) using the 'estat sbcusum' routine. Results of the CUSUM stability tests are available upon request.

income inequality. This also indicates that the growth of finance in the realm of financial markets also boosts income inequality, primarily because the rich have a higher engagement in the financial markets for short-term gains and speculative income (Lee and Siddique, 2021).

We also confirm the existence of a positive and linear relationship between economic growth and the level of income inequality, and the non-existence of a non-linear relationship between them, in the EU countries. This is mainly visible in the long-term estimates, in a context in which the short-term estimates for the growth rate of the GDP per capita and the square of this term are not statistically significant in the majority of our models. As found by Seven and Coskun (2016), this counterintuitive result does not confirm the aforementioned Kuznets curve (Kuznets, 1955), and suggests that economic growth has not been generating significant redistributive effects in the EU countries. This is particularly relevant for the EU countries, given that the majority of them have exhibited quite timid growth rates since the 1980s (Figure A11 in the Appendix), with the average growth rate of all the EU countries having been only around 2% from 1980 to 2019 (Table A2 in the Appendix). Bolarinwa *et al.* (2021) also report a positive and linear relationship between economic growth and the level of inequality for African countries, claiming that the rich get richer and the poor get poorer as income increases.

We also find that the inflation rate does not have any effect on the level of income inequality in the EU countries over either the long term or the short term, given the lack of statistical significance of its coefficients in all the linear models. This could be attributable to the existence of social benefits for the poor that are traditionally directly indexed to inflation and that ensure that poorer people are directly hedged against inflation and do not lose purchasing power during high-inflation episodes. Adeleye *et al.* (2017) also report the lack of statistical significance of the relationship between inflation rate and income inequality in the case of African countries.

Another unexpected finding is related to educational attainment, which has a positive impact on the level of income inequality in the EU countries, mainly in the long term since it is statistically insignificant in the case of the short-term estimates. This is mainly visible in the linear models in which the gross and the net top 1% income share and the gross and the net top 10% income share are used as proxies for the level of income inequality. A similar result has been found by Barradas and Lakhani (2023) for Portugal and by Bolarinwa *et al*. (2021) for African countries. These authors provide two different reasons to explain this positive relationship between educational attainment and the level of income inequality. First, it could be the result of the consequent decrease in the wage gap between skilled and unskilled workers that tends to have a relatively greater effect on richer people than on poorer. Secondly, it could be the result of higher levels of unemployment and precariousness among young people and particularly among graduates.

Government spending is a negative determinant of income inequality in the EU countries, especially in the short term. As emphasised by Kim and Lin (2021), and Bolarinwa *et al*. (2021), this suggests that the redistributive function, through the tax system and social benefits aimed at the poor, the provision of public goods and the intervention of the welfare state have been relatively effective to alleviate the level of income inequality in the EU countries. A negative relationship between government spending and the level of income inequality is also reported by Lee and Siddique (2021) for both developing and developed countries.

The degree of trade openness tends to have a positive effect on the level of income inequality in the EU countries, albeit only in the long term. In the short term, all of our estimates for the linear models reveal that trade openness is not statistically significant at the traditional significance levels. This result is in accordance with the Heckscher–Ohlin–Samuelson theory and the consequent increase in both the wage gap between skilled and unskilled workers and income inequality, in the case of developed countries such as the EU countries, as the degree of trade openness increases (Kim and Lin, 2011; Bolarinwa *et al*., 2021). A similar result is found by Makhlouf *et al*. (2020) for the OECD countries.

Regarding the non-linear models, our findings are also quite robust, because our short-term and long-term estimates do not change radically in terms of statistical significance and the signs of the coefficients when we use different variables as proxies for the level of income inequality and/or different variables as proxies for finance and/or in comparison to the long-term and short-term estimates of the linear models. Four different similarities should be addressed. First, we continue to find evidence suggesting the existence of a positive and linear relationship between economic growth and the level of income inequality, and the non-existence of a non-linear relationship between them, for the EU countries. Secondly, educational attainment and the degree of trade openness remain statistically significant at the traditional significance levels, exerting a positive impact on the level of income inequality in the EU countries in the long term. Thirdly, we are also able to report that government spending continues to have a negative influence on the level of income inequality in the EU countries, mainly in the short term. Fourthly, the inflation rate remains statistically insignificant at the traditional significance levels in both the long term and the short term.

The most important finding is associated with the non-existence of a non-linear relationship between finance and the level of income inequality for the EU countries, particularly the lack of statistical significance for the different variables used as proxies for finance (and their square terms) in all the non-linear models. By itself, this result does not exclude the existence of a convex quadratic (non-linear) relationship between finance and income inequality in the EU countries, similar to what was found by Tan and Law (2012) for developing countries and by Barradas and Lakhani (2023) for Portugal. The result could simply indicate that finance has a positive effect on income inequality in the EU countries because the threshold (minimum) of the convex quadratic function was already reached a long time ago, which is more possible given the strong growth of finance in these countries in times of financialisation (Figures A7 to A10 in the Appendix).

Summing up, we find strong evidence for a positive and linear relationship between finance and the level of income inequality in the EU countries, which supports the beliefs of the non-mainstream literature that the growth of finance has harmful effects on contemporary societies in times of financialisation.

7. CONCLUSION

This paper aimed to contribute to the current debate between the mainstream and the non-mainstream literature on the role played by the growth of finance on the level of income inequality by performing a panel data econometric analysis for all the EU countries from 1980 to 2019.

Income inequality has remained at very high levels in the last four decades in the majority of the EU countries, and that this has occurred simultaneously with a strong growth in finance in these countries during that time. This seems to confirm that the nexus between finance and income inequality is indeed broken in times of financialisation, refuting the mainstream claims of the supportive effect of the growth of finance on the level of income inequality.

A linear model and a non-linear model were estimated using a panel autoregressive distributed lag approach and, particularly, by relying on the DFE estimator, because of the existence of variables that are stationary in levels and stationary in the first differences (Pesaran and Smith, 1995; Pesaran, 1997; Pesaran *et al*., 1997, 1999).

Our findings confirm that finance, economic growth, educational attainment and the degree of trade openness exert a positive long-term effect on the level of income inequality in the EU countries, whilst government spending has a negative impact in the short term. All of these findings are robust to the different proxies chosen.

Our findings imply that policy makers should rethink the functioning of the financial system in order to restore a supportive relationship between finance and income inequality and adopt more pro-poor public policies in order to constrain the widening of income inequality in the EU countries. Instead of pursuing processes of liberalisation, deregulation and privatisation of the financial system that sustains the growth of finance, policy makers should ensure the maintenance of public banks and the development of alternative forms of financial institutions (e.g., state development and investment banks, cooperative and mutual banks, ethical banking, microfinance institutions, and local financial institutions) because they are not oriented towards profit and could contribute to promoting greater financial inclusion and more democratised access to financial services for poorer people. The adoption of state credit allocation policies especially for the poor would also be welcomed, and this could be achieved through the introduction of interest rates subsidies, loan guarantee programmes and tax incentives. The re-regulation of the financial system is also desirable in order to avoid the resurgence of more episodes of financial scandal, fraud and crisis, which typically affect the poor more severely. More redistributive policies and increases in taxes related to inheritances and large fortunes could also be important to interrupt the vicious cycles of poverty in the EU countries.

Further research on this topic should focus on the analysis of the direct and/or indirect consequences related to this increasing trend in the level of income inequality in times of financialisation, namely at the level of social tensions, political instability, household indebtedness, labour productivity and economic growth. The empirical analysis of the nexus between finance and poverty in times of financialisation could also represent an important research area.

8. AVAILABILITY DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author upon reasonable request.

9. REFERENCES

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10. APPENDIX

The Appendix of this article can be found online as supplementary material.

ONLINE APPENDIX

Table A1 – The structure and composition of our four unbalanced panels

Country	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Austria	1981-2019	1981-2019	1981-2019	1981-2019
Belgium	1980-2019	1980-2019	1980-2019	1980-2018
Bulgaria	1991-2019	1991-2019	1991-2019	1993-2019
Croatia	1996-2019	1996-2019	1996-2019	1996-2019
Cyprus	1990-2019	1990-2007	1990-2017	2006-2019
Czechia	1993-2019	1993-2019	1993-2019	1993-2019
Denmark	1980-2019	1980-2019	1980-2019	1980-2004
Estonia	1996-2019	1996-2019	2004-2019	2000-2012
Finland	1980-2019	1980-2019	1980-2019	1982-2004
France	1980-2019	1980-2019	1980-2019	1980-2019
Germany	1991-2019	1991-2019	1991-2019	1991-2019
Greece	1980-2019	1980-2019	1980-2019	2001-2019
Hungary	1992-2019	1992-2019	1992-2019	2002-2019
Ireland	1980-2019	1980-2019	1980-2019	1997-2018
Italy	1980-2019	1980-2019	1980-2019	1980-2014
Latvia	1996-2019	1996-2019	1996-2019	1996-2012
Lithuania	1996-2019	1996-2019	1996-2019	1996-2012
Luxembourg	1985-2019	1985-2019	1985-2019	1985-2019
Malta	2006-2019	2006-2019	2006-2019	2006-2019
Netherlands	1980-2019	1980-2019	1980-2019	1980-2017
Poland	1995-2019	1995-2019	1995-2019	1995-2019
Portugal	1980-2019	1980-2019	1980-2019	1980-2018
Romania	1996-2019	1991-2019	1991-2019	1998-2019
Slovakia	1993-2019	1993-2019	2002-2019	1993-2014
Slovenia	1996-2019	1996-2019	1996-2019	1997-2019
Spain	1980-2019	1980-2019	1980-2019	1980-2019
Sweden	1980-2019	1980-2019	1980-2019	1980-2003
United Kingdom	1980-2019	2000-2019	1980-2019	1980-2014
Observations	907	880	893	745
Missing	213	240	227	375
Total	1120	1120	1120	1120

Table A2 – The descriptive statistics of each variable in each unbalanced panel

Unbalanced Panel	Variable	Mean	Median	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis
Credit	***GG***	0.448	0.449	0.628	0.340	0.044	0.066	2.753
	NG	0.353	0.342	0.631	0.241	0.062	0.456	2.639
	GT1	0.104	0.104	0.196	0.037	0.025	0.447	3.666
	NT1	0.077	0.076	0.170	0.030	0.020	0.712	4.682
	GT10	0.335	0.334	0.453	0.237	0.038	0.186	2.985
	NT10	0.277	0272	0.441	0.199	0.037	0.508	3.060
	C	0.752	0.699	2.553	0.067	0.409	1.119	4.886
	EG	0.023	0.022	0.240	-0.145	0.033	-0.237	7.921
	IR	0.064	0.026	10.584	-0.045	0.380	24.319	656.296
	EA	1.031	1.005	1.639	0.539	0.174	0.919	5.035
	GS	0.198	0.195	0.281	0.117	0.031	0.224	2.785
	TO	1.001	0.846	3.801	0.316	0.568	1.867	7.490
Credit-to-Deposit Ratio	***GG***	0.448	0.448	0.628	0.340	0.045	0.088	2.739
	NG	0.353	0.342	0.631	0.241	0.063	0.451	2.620
	GT1	0.104	0.104	0.196	0.037	0.025	0.440	3.657
	NT1	0.077	0.076	0.170	0.025	0.020	0.671	4.681
	GT10	0.334	0.334	0.453	0.237	0.038	0.194	2.981
	NT10	0.277	0.272	0.441	0.188	0.037	0.498	3.068
	CDR	1.050	1.012	3.760	0.004	0.515	1.518	8.262
	EG	0.023	0.022	0.240	-0.145	0.034	-0.314	8.062
	IR	0.075	0.026	10.584	-0.045	0.410	20.485	499.980
	EA	1.034	1.008	1.639	0.539	0.176	0.883	4.926
	GS	0.198	0.195	0.281	0.117	0.032	0.182	2.764
	TO	1.006	0.848	3.801	0.316	0.571	1.872	7.450
Liquid Liabilities	***GG***	0.448	0.449	0.628	0.340	0.043	0.036	2.738
	NG	0.352	0.342	0.631	0.241	0.062	0.453	2.670
	GT1	0.104	0.104	0.196	0.034	0.024	0.422	3.748
	NT1	0.076	0.076	0.170	0.025	0.019	0.470	4.320
	GT10	0.334	0.334	0.453	0.237	0.037	0.158	2.952
	NT10	0.276	0.272	0.441	0.188	0.036	0.414	2.958
	LL	0.920	0.680	9.405	0.010	1.111	5.370	34.363
	EG	0.022	0.022	0.240	-0.145	0.033	-0.371	8.103
	IR	0.073	0.025	10.584	-0.045	0.407	20.642	507.543
	EA	1.032	1.008	1.639	0.539	0.175	0.887	4.949
	GS	0.197	0.194	0.279	0.117	0.031	0.207	2.788
	TO	0.993	0.837	3.801	0.316	0.572	1.893	7.510
Stock Market Capitalization	***GG***	0.448	0.450	0.569	0.348	0.043	0.013	2.590
	NG	0.352	0.344	0.594	0.241	0.060	0.399	2.526
	GT1	0.104	0.104	0.196	0.037	0.026	0.438	3.536
	NT1	0.076	0.076	0.170	0.030	0.020	0.711	4.832
	GT10	0.334	0.335	0.453	0.237	0.038	0.165	2.962
	NT10	0.275	0.272	0.400	0.199	0.036	0.406	2.797
	SMC	0.405	0.283	3.219	0.000	0.375	1.867	8.601
	EG	0.024	0.022	0.240	-0.145	0.034	-0.234	8.033
	IR	0.059	0.026	10.584	-0.045	0.395	25.562	680.350
	EA	1.025	1.005	1.639	0.539	0.169	0.949	5.590
	GS	0.197	0.195	0.281	0.119	0.023	0.184	2.896
	TO	1.004	0.822	3.801	0.316	0.599	1.892	7.178

Table A3 – The correlation matrices between all the variables in each unbalanced panel[1]

Unbalanced Panel	Variable	*GG*	*GT1*	*GT10*	*Finance*	*EG*	*IR*	*EA*	*GS*	*TO*
Credit	***GG***	1.000								
	GT1	0.661***	1.000							
	GT10	0.948***	0.833***	1.000						
	C	0.088***	0.118***	0.100***	1.000					
	EG	0.133***	0.163***	0.157***	-0.308***	1.000				
	IR	0.019	0.001	0.026	-0.115***	-0.188***	1.000			
	EA	-0.134***	-0.064*	-0.111***	0.260***	-0.094***	-0.101***	1.000		
	GS	-0.557***	-0.406***	-0.544***	0.055*	-0.237***	-0.119***	0.409***	1.000	
	TO	0.037	0.197***	0.108***	0.067**	0.133***	-0.052	0.123***	-0.212***	1.000
Credit-to-Deposit Ratio	***GG***	1.000								
	GT1	0.661***	1.000							
	GT10	0.949***	0.831***	1.000						
	CDR	-0.110***	-0.066**	-0.105***	1.000					
	EG	0.157***	0.184***	0.182***	-0.177***	1.000				
	IR	-0.007	-0.021	0.001	-0.076**	-0.220***	1.000			
	EA	-0.133***	-0.077***	-0.119***	0.288***	-0.094***	-0.125***	1.000		
	GS	-0.536***	-0.395***	-0.527***	0.366***	-0.224***	-0.158***	0.425***	1.000	
	TO	0.036	0.191***	0.102***	-0.208***	0.139***	-0.069**	0.117***	-0.202***	1.000
Liquid Liabilities	***GG***	1.000								
	GT1	0.638***	1.000							
	GT10	0.944***	0.821***	1.000						
	LL	0.190***	0.330***	0.246***	1.000					
	EG	0.129***	0.157***	0.153***	-0.082**	1.000				
	IR	-0.009	-0.022	0.001	-0.055	-0.220***	1.000			
	EA	-0.139***	-0.065*	-0.118***	-0.008	-0.079**	-0.123***	1.000		
	GS	-0.546***	-0.398***	-0.537***	-0.245***	-0.232***	-0.158***	0.435***	1.000	
	TO	0.031	0.196***	0.104***	0.618***	0.129***	-0.068**	0.134***	-0.204***	1.000
Stock Market Capitalization	***GG***	1.000								
	GT1	0.676***	1.000							
	GT10	0.949***	0.843***	1.000						
	SMC	0.093**	0.215***	0.133***	1.000					
	EG	0.120***	0.149***	0.141***	-0.026	1.000				
	IR	0.037	0.016	0.043	-0.090**	-0.161***	1.000			
	EA	-0.129***	-0.099***	-0.112***	0.307***	-0.102***	-0.084**	1.000		
	GS	-0.565***	-0.489***	-0.571***	0.004	-0.229***	-0.123***	0.375***	1.000	
	TO	0.039	0.197***	0.109***	0.286***	0.102***	-0.041	0.124***	-0.232***	1.000

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

[1] Just for simplicity, we do not include in these correlation matrices the variables of net Gini, net top 1% income share and net 10% income share. The correlation matrices with these variables are available upon request.

Table A4 – *P-values* of the Karavias and Tzavalis (2014) unit root test with two unknown structural breaks

Unbalanced Panel	Variable	Levels		First Differences	
		Individual Intercepts	Individual Intercepts and Individual Linear Trends	Individual Intercepts	Individual Intercepts and Individual Linear Trends
Credit	***GG***	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NG	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GT1	0.000 (1981 and 2018)	0.000 (1982 and 1985)	n.a.	n.a.
	NT1	0.000 (2017 and 2018)	0.000 (1982 and 1985)	n.a.	n.a.
	GT10	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NT10	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	C	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 2016)
	C^2	0.000 (1981 and 2018)	1.000	n.a.	0.000 (2006 and 2010)
	EG	0.000 (1981 and 1982)	0.000 (1982 and 1984)	n.a.	n.a.
	EG^2	0.000 (2014 and 2016)	0.000 (2014 and 2017)	n.a.	n.a.
	IR	0.000 (1996 and 1998)	0.000 (1995 and 1998)	n.a.	n.a.
	EA	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
	GS	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
	TO	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
Credit-to-Deposit Ratio	***GG***	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NG	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GT1	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NT1	0.000 (2017 and 2018)	0.000 (1982 and 1985)	n.a.	n.a.
	GT10	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NT10	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	CDR	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	CDR^2	0.000 (1981 and 2000)	1.000	n.a.	0.000 (1982 and 1984)
	EG	0.000 (1981 and 1982)	0.000 (1982 and 1984)	n.a.	n.a.
	EG^2	0.000 (2014 and 2016)	0.000 (2014 and 2017	n.a.	n.a.
	IR	0.000 (1996 and 1998)	0.000 (1995 and 1998)	n.a.	n.a.
	EA	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GS	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
	TO	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
Liquid Liabilities	***GG***	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NG	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GT1	0.000 (2017 and 2018)	0.000 (2017 and 2018)	n.a.	n.a.
	NT1	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GT10	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NT10	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	LL	0.000 (1996 and 1997)	1.000	n.a.	0.000 (1982 and 1984)
	LL^2	0.860	1.000	0.000 (1981 and 1982)	0.000 (2007 and 2016)
	EG	0.000 (1981 and 1982)	0.000 (1982 and 1984)	n.a.	n.a.
	EG^2	0.000 (2014 and 2016)	0.000 (2014 and 2017)	n.a.	n.a.
	IR	0.000 (1996 and 1998)	0.000 (1995 and 1998)	n.a.	n.a.
	EA	0.000 (1981 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GS	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
	TO	0.000 (1981 and 1982)	1.000	n.a.	0.000 (1982 and 1984)
Stock Market Capitalization	***GG***	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NG	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GT1	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NT1	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	GT10	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	NT10	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	SMC	0.000 (2017 and 2018)	0.000 (1982 and 1985)	n.a.	n.a.
	SMC^2	0.000 (1981 and 1982)	0.000 (2001 and 2008)	n.a.	n.a.
	EG	0.000 (1981 and 2018)	0.000 (1982 and 1984)	n.a.	n.a.
	EG^2	0.000 (2014 and 2016)	0.000 (2014 and 2017)	n.a.	n.a.
	IR	1.000	0.000 (1995 and 1998)	0.000 (1997 and 1998)	n.a.
	EA	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 2016)
	GS	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)
	TO	0.000 (2017 and 2018)	1.000	n.a.	0.000 (1982 and 1984)

Note: Break dates are reported in ()

Figure A1 – Gross Gini (%)

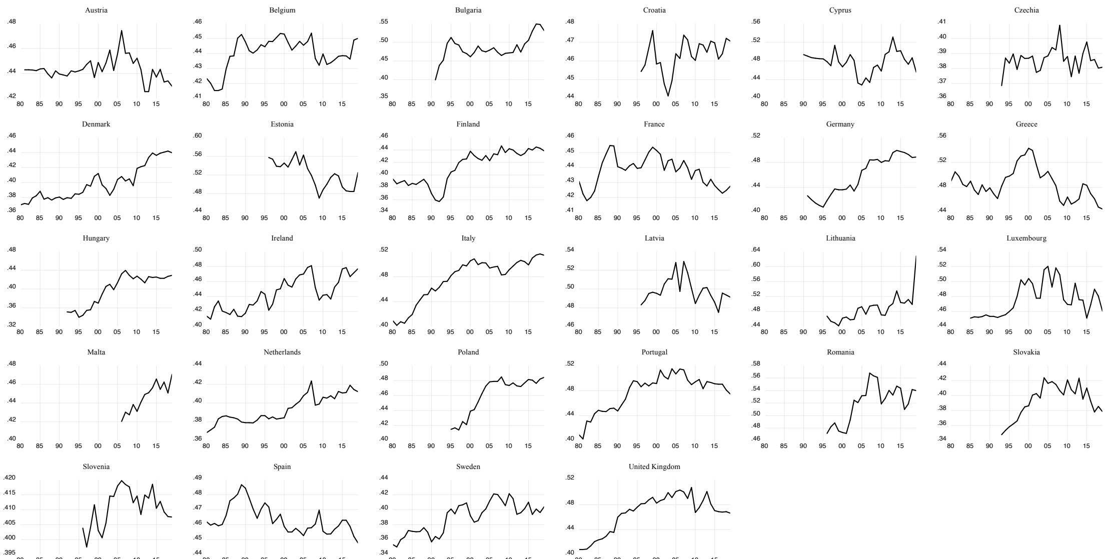

Figure A2 – Net Gini (%)

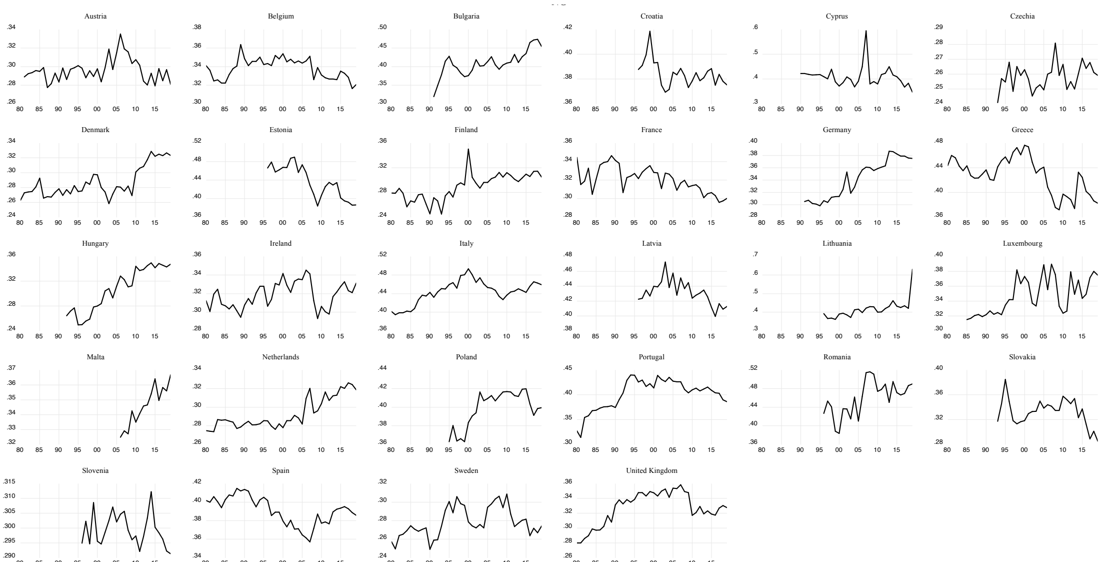

Figure A3 – Gross top 1% income share (%)

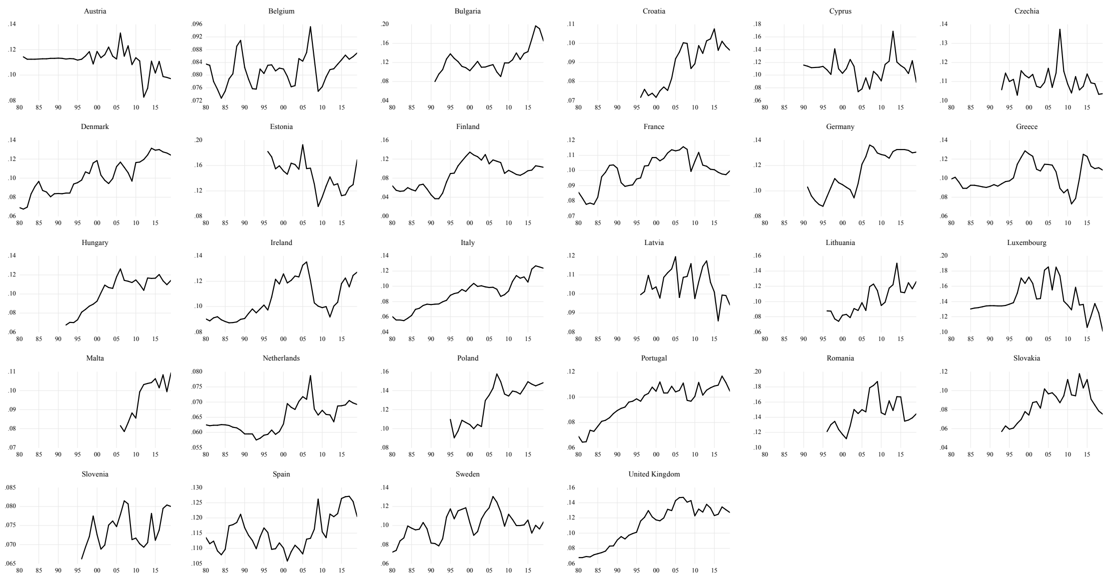

Figure A4 – Net top 1% income share (%)

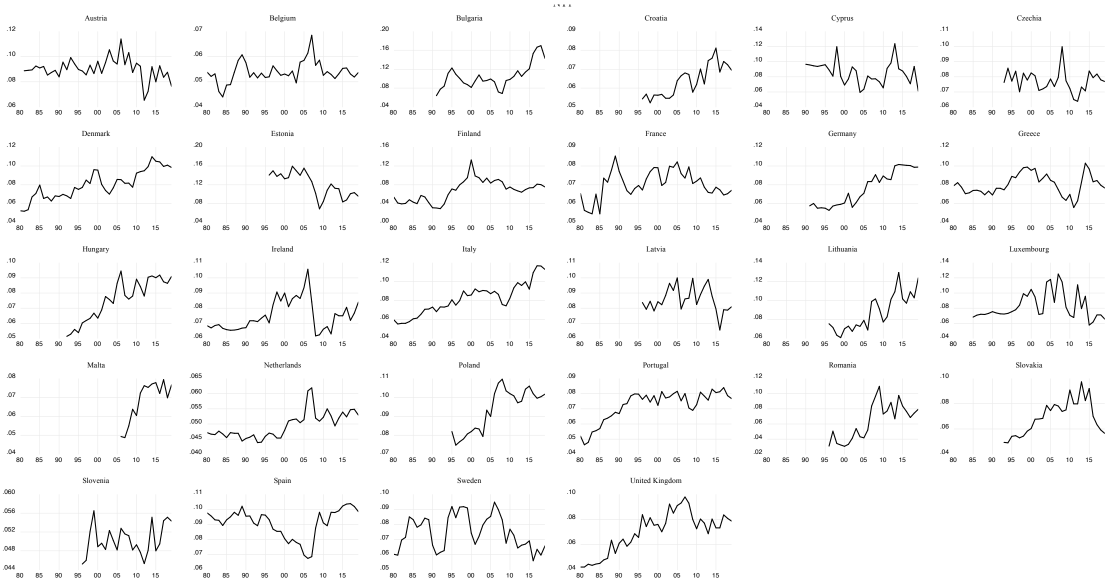

Figure A5 – Gross top 10% income share (%)

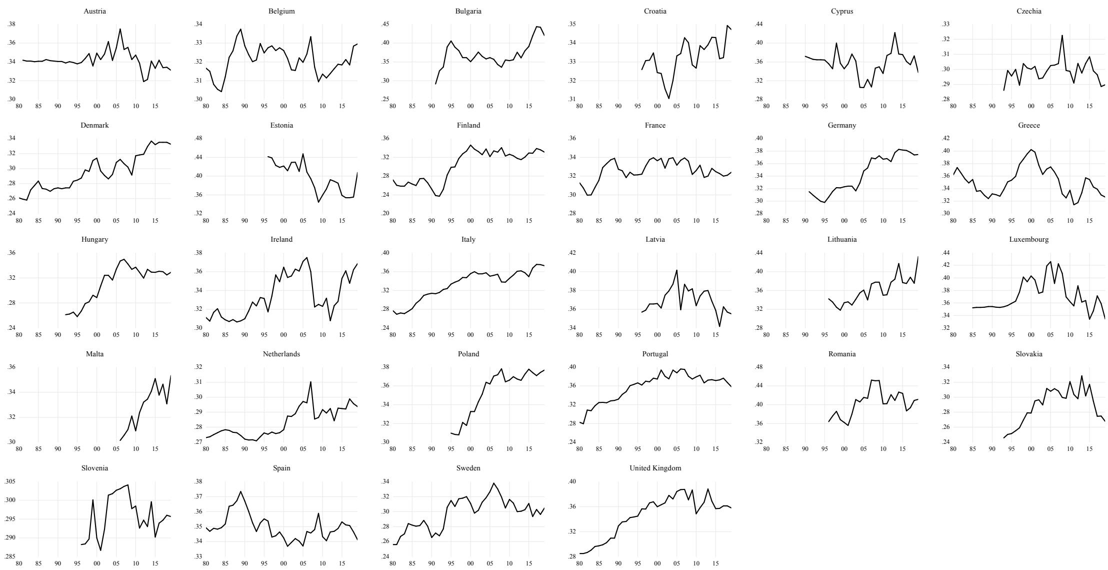

Figure A6 – Net top 10% income share (%)

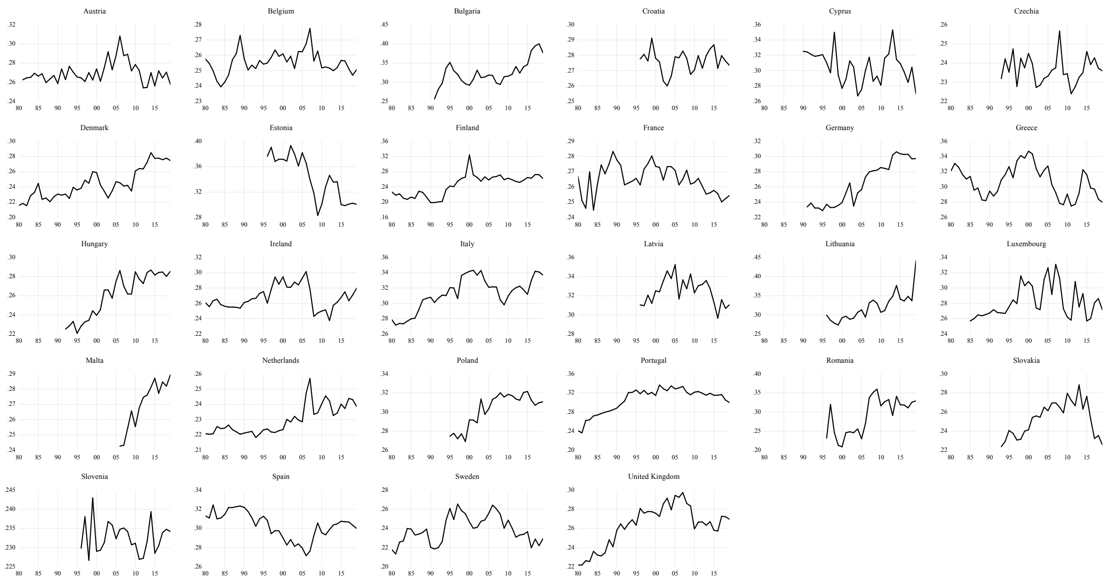

Figure A7 – Credit (% of the GDP)

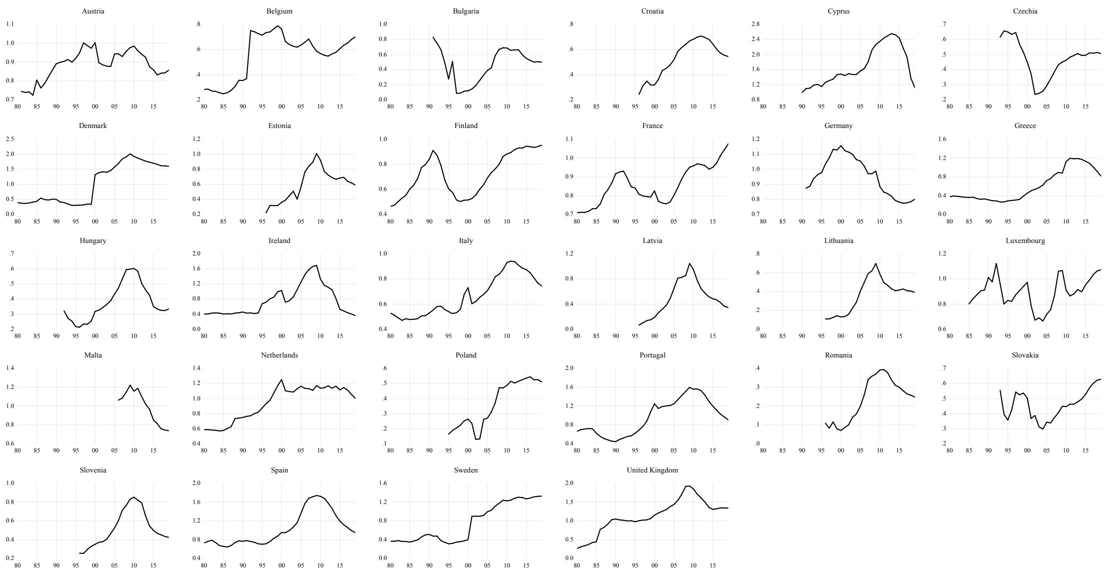

Figure A8 – Credit-to-deposit ratio (%)

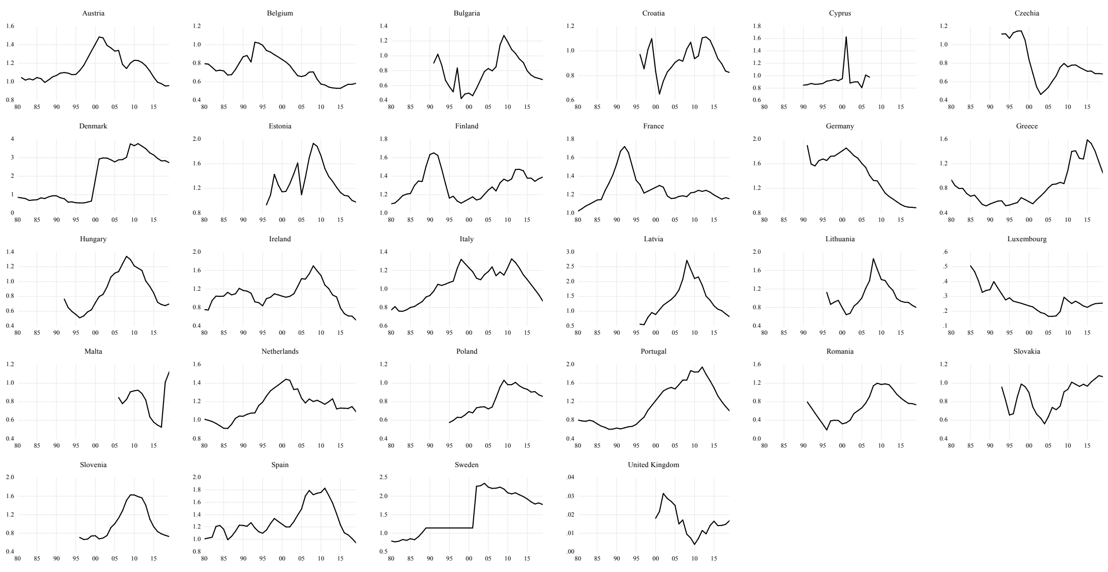

Figure A9 – Liquid liabilities (% of the GDP)

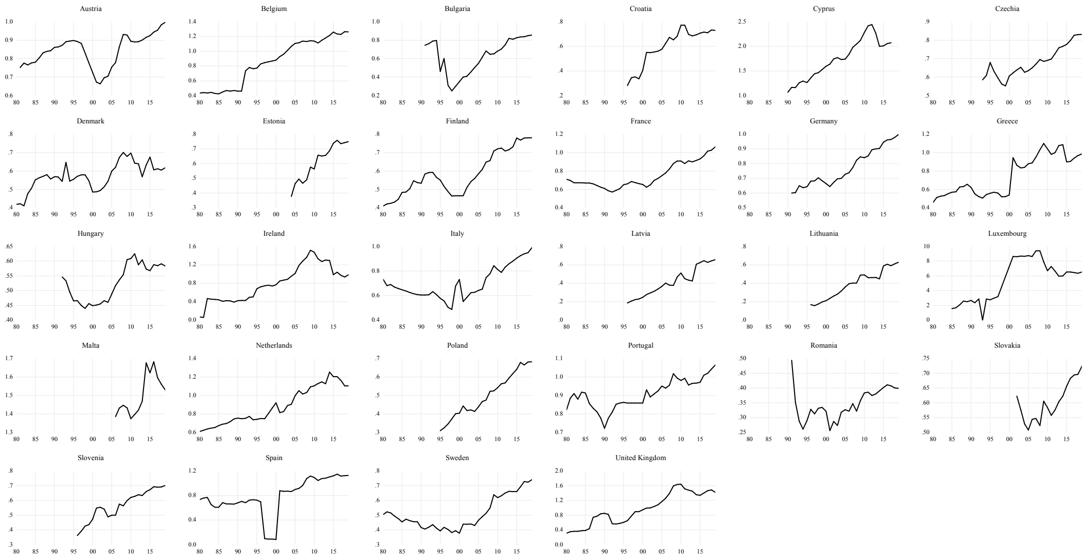

Figure A10 – Stock market capitalization (% of the GDP)

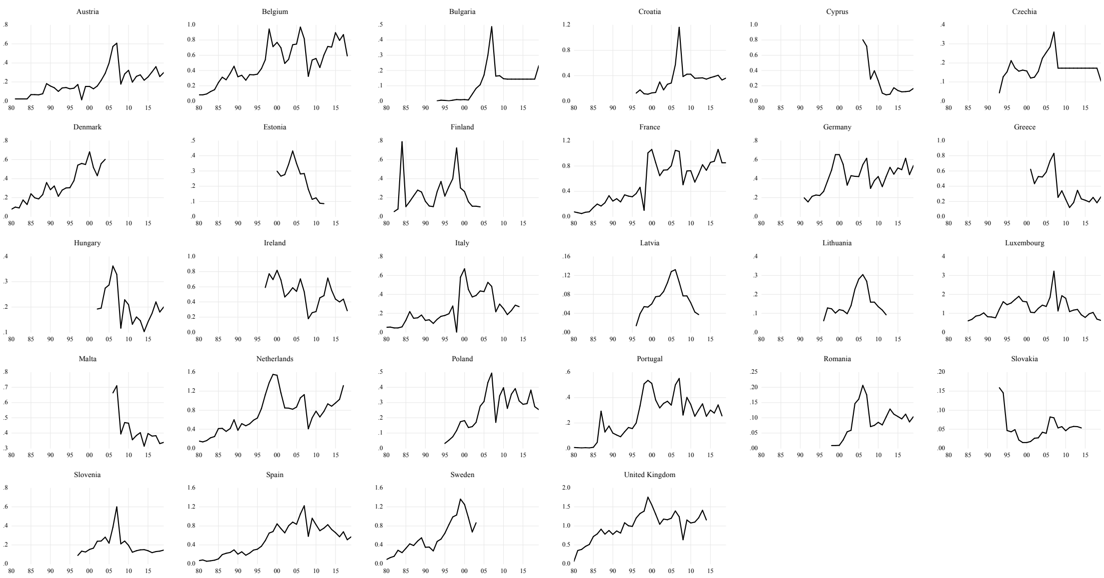

Figure A11 – Economic growth (annual %)

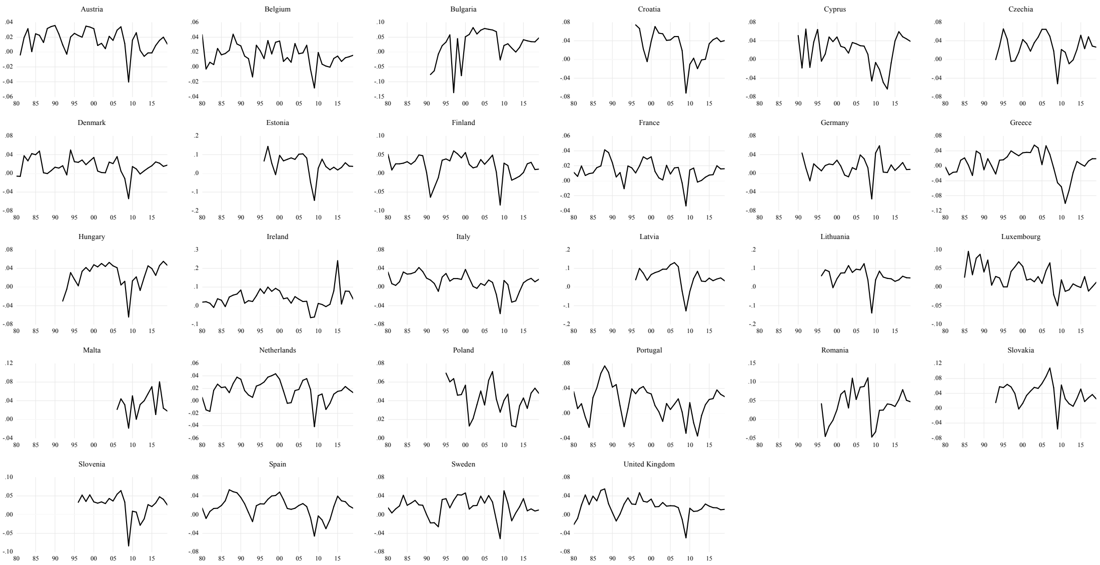

Figure A12 – Inflation rate (annual %)

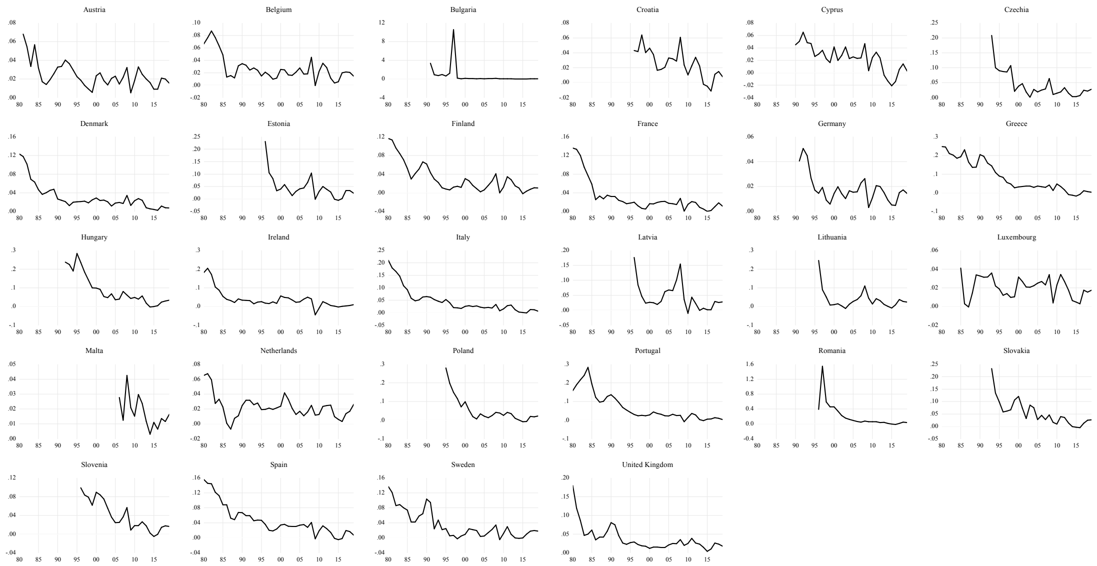

Figure A13 – Educational attainment (%)

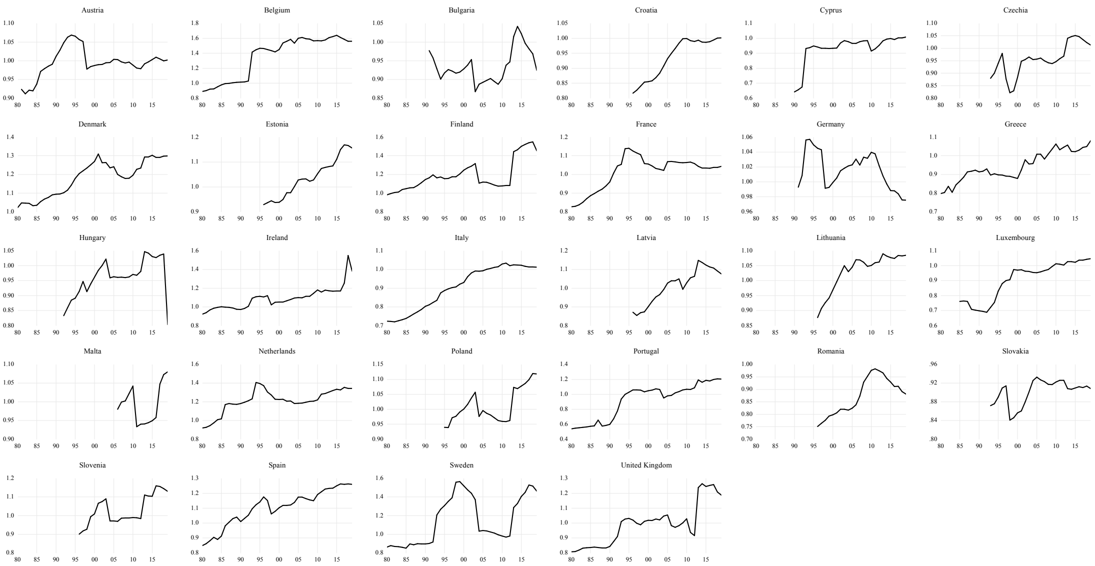

Figure A14 – Government spending (% of the GDP)

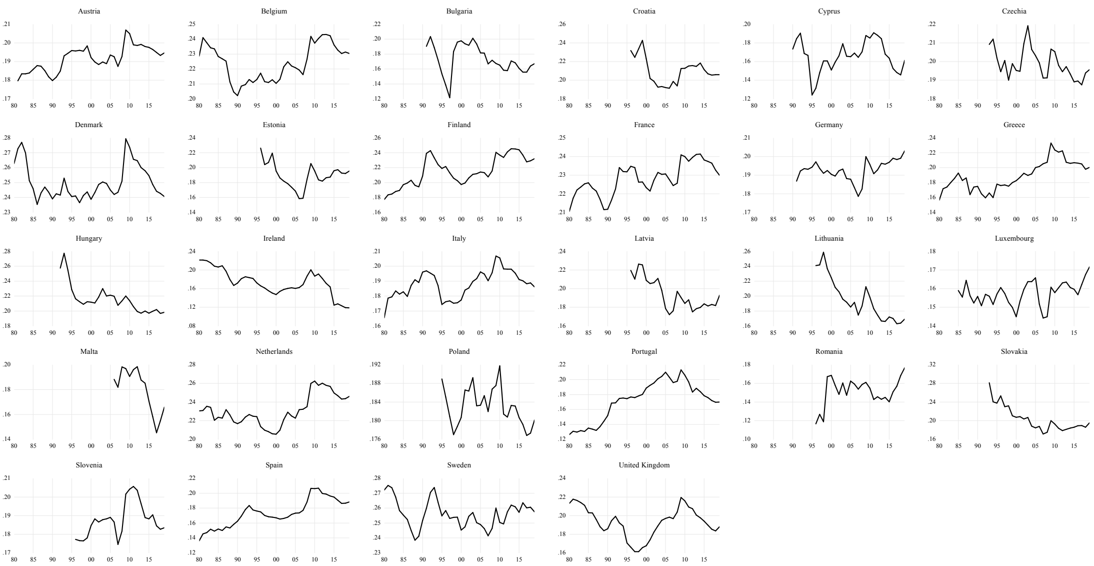

Figure A15 – Trade openness (% of the GDP)

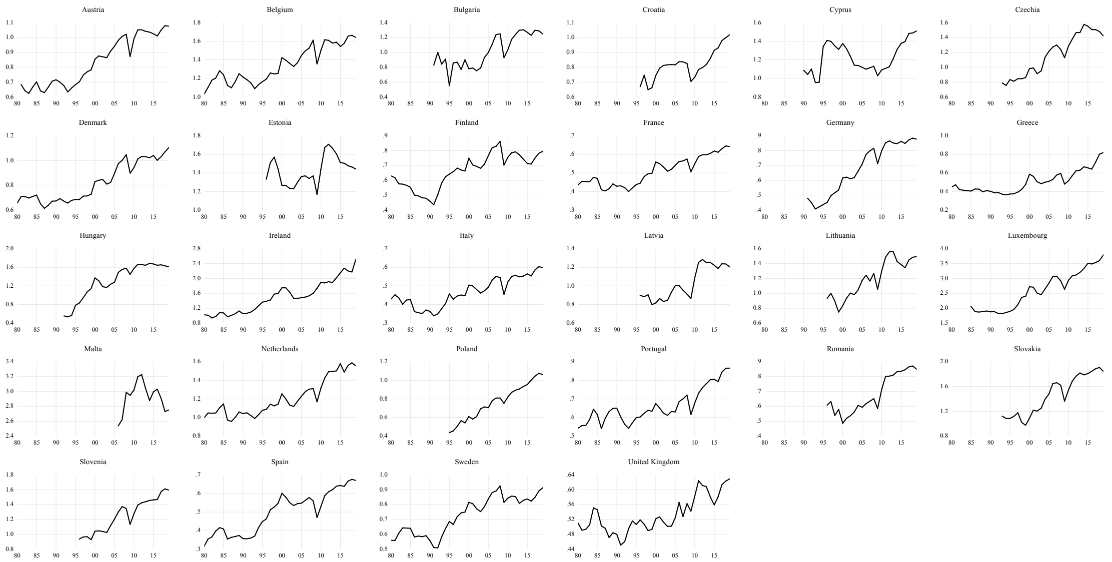

Table A5 – Estimates for the linear model and for the gross Gini

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
F_t	0.019** (0.010) [2.02]	0.011* (0.007) [1.68]	0.001 (0.005) [0.26]	0.022** (0.011) [2.08]
EG_t	0.331*** (0.115) [2.87]	0.428*** (0.114) [3.76]	0.276** (0.110) [2.51]	0.238*** (0.093) [2.56]
EG_t^2	-1.627 (1.237) [-1.32]	-1.823 (1.206) [-1.51]	-1.329 (1.237) [-1.07]	-0.975 (1.072) [-0.91]
IR_t	-0.002 (0.009) [-0.17]	-0.001 (0.008) [-0.10]	-0.004 (0.009) [-0.50]	-0.005 (0.007) [-0.62]
EA_t	0.017 (0.022) [0.5]	0.019 (0.021) [0.90]	0.029 (0.021) [1.37]	0.025 (0.021) [1.16]
GS_t	-0.227 (0.164) [-1.38]	-0.178 (0.165) [-1.08]	-0.207 (0.173) [-1.19]	0.007 (0.156) [-0.04]
TO_t	0.013 (0.012) [1.04]	0.020* (0.012) [1.65]	0.020 (0.014) [1.37]	-0.0004 (0.011) [-0.04]
Short-term Coefficients				
Intercept	0.077*** (0.010) [7.48]	0.074*** (0.010) [7.57]	0.074*** (0.010) [7.49]	0.079*** (0.011) [7.29]
Error Correction Term$_t$	-0.171*** (0.020) [-8.51]	-0.172*** (0.020) [-8.71]	-0.169*** (0.019) [-8.74]	-0.191*** (0.021) [-9.07]
ΔF_t	-0.003 (0.005) [-0.57]	-0.006* (0.003) [-1.73]	0.002 (0.002) [1.14]	0.003 (0.002) [1.40]
ΔEG_t	0.001 (0.017) [0.07]	-0.004 (0.016([-0.24]	0.004 (0.016) [0.22]	-0.018 (0.016) [-1.14]
ΔEG_t^2	0.144 (0.151) [0.95]	0.150 (0.148) [1.02]	0.136 (0.151) [0.90]	0.086 (0.144) [0.59]
ΔIR_t	0.001 (0.001) [0.61]	0.001 (0.001) [0.69]	0.001 (0.001) [0.68]	0.001 (0.001) [0.61]
ΔEA_t	0.001 (0.009) [0.10]	-0.0003 (0.009) [-0.04]	0.0003 (0.009) [0.03]	0.002 (0.010) [0.22]
ΔGS_t	-0.048 (0.058) [-0.82]	-0.045 (0.059) [-0.76]	-0.046 (0.061) [-0.75]	-0.155*** (0.059) [-2.61]
ΔTO_t	-0.002 (0.006) -0.26]	-0.003 (0.006) [-0.49]	-0.0003 (0.006) [-0.05]	0.003 (0.006) [0.42]
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A6 – Estimates for the linear model and for the gross top 1% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	0.018***	0.010***	0.003	0.021**
F_t	(0.006)	(0.004)	(0.003)	(0.008)
	[3.05]	[2.62]	[0.78]	[2.50]
	0.281***	0.351***	0.252***	0.182***
EG_t	(0.071)	(0.069)	(0.072)	(0.073)
	[3.99]	[5.08]	[3.49]	[2.49]
	-0.997	-1.125	-0.660	-1.140
EG_t^2	(0.741)	(0.709)	(0.784)	(0.840)
	[-1.35]	[-1.59]	[-0.84]	[-1.36]
	-0.002	-0.001	-0.004	-0.004
IR_t	(0.006)	(0.005)	(0.006)	(0.006)
	[-0.40]	[-0.29]	[-0.68]	[-0.63]
	0.032**	0.033***	0.044***	0.030***
EA_t	(0.013)	(0.013)	(0.014)	(0.017)
	[2.43]	[2.58]	[3.21]	[1.81]
	-0.173*	-0.119	-0.104	-0.147
GS_t	(0.100)	(0.098)	(0.111)	(0.122)
	[-1.74]	[-1.22]	[-0.94]	[-1.21]
	-0.001	0.005	0.0003	-0.003
TO_t	(0.008)	(0.007)	(0.009)	(0.009)
	[-0.19]	[0.62]	[0.03]	[-0.33]
Short-term Coefficients				
	0.020***	0.017***	0.015***	0.021***
Constant	(0.005)	(0.005)	(0.006)	(0.006)
	[3.73]	[3.23]	[2.83]	[3.33]
	-0.224***	-0.222***	-0.208***	-0.218***
Error Correction Term$_t$	(0.021)	(0.021)	(0.021)	(0.024)
	[-10.53]	[-10.56]	[-10.01]	[-8.99]
	-0.006	-0.008***	0.002	0.002
ΔF_t	(0.004)	(0.003)	(0.002)	(0.002)
	[-1.35]	[-3.00]	[1.14]	[0.99]
	-0.018	-0.021*	-0.011	-0.024*
ΔEG_t	(0.013)	(0.013)	(0.013)	(0.014)
	[-1.38]	[-1.63]	[-0.84]	[-1.68]
	0.116	0.096	0.078	0.129
ΔEG_t^2	(0.120)	(0.114)	(0.120)	(0.128)
	[0.97]	[0.84]	[0.65]	[1.00]
	-0.0001	0.0002	0.0001	-0.0004
ΔIR_t	(0.001)	(0.001)	(0.0009)	(0.001)
	[-0.13]	[0.27]	[0.11]	[-0.36]
	-0.007	-0.008	-0.009	-0.008
ΔEA_t	(0.007)	(0.007)	(0.007)	(0.009)
	[-0.97]	[-1.11]	[-1.17]	[-0.86]
	-0.127***	-0.119***	-0.140***	-0.198***
ΔGS_t	(0.047)	(0.045)	(0.049)	(0.053)
	[-2.73]	[-2.62]	[-2.87]	[-3.73]
	0.001	-0.001	0.001	0.003
ΔTO_t	(0.005)	(0.005)	(0.005)	(0.006)
	[0.21]	[-0.18]	[0.13]	[0.51]
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A7 – Estimates for the linear model and for the gross top 10% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	0.018**	0.012**	0.003	0.027**
F_t	(0.009)	(0.006)	(0.005)	(0.011)
	[2.03]	[1.96]	[0.59]	[2.47]
	0.335***	0.449***	0.297***	0.222**
EG_t	(0.107)	(0.105)	(0.103)	(0.096)
	[3.14]	[4.29]	[2.88]	[2.31]
	-0.809	-1.080	-0.604	-0.885
EG_t^2	(1.132)	(1.090)	(1.137)	(1.115)
	[-0.71]	[-0.99]	[-0.53]	[-0.79]
	-0.004	-0.002	-0.005	-0.006
IR_t	(0.009)	(0.008)	(0.008)	(0.008)
	[0.42]	[-0.20]	[-0.62]	[-0.76]
	0.035*	0.034*	0.047***	0.032
EA_t	(0.020)	(0.019)	(0.020)	(0.022)
	[1.74]	[1.76]	[2.37]	[1.45]
	-0.210	-0.158	-0.172	-0.103
GS_t	(0.153)	(0.151)	(0.161)	(0.162)
	[-1.38]	[-1.04]	[-1.07]	[-0.63]
	0.001	0.008	0.005	-0.005
TO_t	(0.012)	(0.011)	(0.013)	(0.012)
	[0.09]	[0.73]	[0.35]	[-0.37]
Short-term Coefficients				
	0.060***	0.057***	0.057***	0.063***
Constant	(0.009)	(0.008)	(0.009)	(0.010)
	[6.99]	[6.97]	[6.73]	[6.46]
	-0.186***	-0.186***	-0.183***	-0.199***
Error Correction Term$_t$	(0.019)	(0.019)	(0.019)	(0.022)
	[-9.58]	[-9.73]	[-9.70]	[-9.15]
	-0.005	-0.009***	0.002	0.004
ΔF_t	(0.005)	(0.003)	(0.002)	(0.003)
	[-0.90]	[-2.58]	[1.17]	[1.56]
	-0.015	-0.021	-0.011	-0.030*
ΔEG_t	(0.017)	(0.016)	(0.016)	(0.017)
	[-0.91]	[-1.27]	[-0.67]	[-1.75]
	0.132	0.126	0.120	0.120
ΔEG_t^2	(0.153)	(0.147)	(0.153)	(0.156)
	[0.86]	[0.85]	[0.79]	[0.77]
	0.0003	0.0005	0.0004	0.0001
ΔIR_t	(0.001)	(0.001)	(0.001)	(0.001)
	[0.23]	[0.39]	[0.31]	[0.12]
	-0.003	-0.004	-0.004	-0.002
ΔEA_t	(0.009)	(0.009)	(0.009)	(0.011)
	[-0.37]	[-0.48]	[-0.46]	[-0.21]
	-0.089	-0.086	-0.094	-0.194***
ΔGS_t	(0.059)	(0.059)	(0.062)	(0.065)
	[-1.51]	[-1.47]	[-1.51]	[-3.00]
	0.002	-0.001	0.002	0.004
ΔTO_t	(0.006)	(0.006)	(0.006)	(0.007)
	[0.28]	[-0.12]	[0.27]	[0.57]
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A8 – Estimates for the linear model and for the net Gini

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	0.001	0.008	-0.0002	0.015*
F_t	(0.009)	(0.007)	(0.004)	(0.009)
	[0.08]	[1.08]	[-0.05]	[1.71]
	0.141	0.324***	0.154*	0.108
EG_t	(0.101)	(0.125)	(0.090)	(0.075)
	[1.40]	[2.60]	[1.72]	[1.43]
	-0.644	-1.709	-0.900	-0.454
EG_t^2	(1.085)	(1.342)	(1.013)	(0.891)
	[-0.59]	[-1.27]	[-0.89]	[-0.51]
	-0.008	-0.005	-0.010	-0.006
IR_t	(0.008)	(0.010)	(0.007)	(0.006)
	[-0.92]	[-0.56]	[-1.45]	[-0.98]
	0.004	-0.003	0.008	0.008
EA_t	(0.020)	(0.024)	(0.018)	(0.018)
	[0.18]	[-0.11]	[0.45]	[0.46]
	-0.113	-0.088	-0.173	0.044
GS_t	(0.147)	(0.185)	(0.144)	(0.131)
	[-0.77]	[-0.47]	[-1.20]	[0.34]
	0.021*	0.021	0.026*	0.013
TO_t	(0.011)	(0.014)	(0.012)	(0.009)
	[1.93]	[1.56]	[2.16]	[1.38]
Short-term Coefficients				
	0.101***	0.075***	0.107***	0.113***
Constant	(0.013)	(0.012)	(0.013)	(0.014)
	[7.68]	[6.09]	[8.07]	[8.12]
	-0.288***	-0.220***	-0.304***	-0.358***
Error Correction Term$_t$	(0.027)	(0.027)	(0.027)	(0.029)
	[-10.56]	[-8.24]	[-11.25]	[-12.23]
	-0.001	-0.008	0.004	0.002
ΔF_t	(0.008)	(0.005)	(0.003)	(0.004)
	[-0.08]	[-1.58]	[1.41]	[0.49]
	0.008	-0.002	0.007	-0.019
ΔEG_t	(0.025)	(0.024)	(0.024)	(0.025)
	[0.31]	[-0.09]	[0.29]	[-0.78]
	0.228	0.317	0.292	0.182
ΔEG_t^2	(0.228)	(0.213)	(0.227)	(0.225)
	[1.00]	[1.49]	[1.29]	[0.81]
	0.001	0.001	0.002	0.0003
ΔIR_t	(0.002)	(0.002)	(0.002)	(0.002)
	[0.72]	[0.60]	[1.07]	[0.20]
	0.004	0.001	0.005	0.007
ΔEA_t	(0.014)	(0.013)	(0.014)	(0.016)
	[0.26]	[0.10]	[0.36]	[0.44]
	-0.117	-0.091	-0.061	-0.273***
ΔGS_t	(0.008)	(0.009)	(0.092)	(0.093)
	[-1.33]	[-1.08]	[-0.66]	[-2.93]
	-0.005	-0.005	-0.006	-0.002
ΔTO_t	(0.009)	(0.009)	(0.009)	(0.010)
	[-0.55]	[-0.62]	[-0.66]	[-0.20]
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A9 – Estimates for the linear model and for the net top 1% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	0.007	0.007**	0.002	0.010
F_t	(0.005)	(0.003)	(0.002)	(0.006)
	[1.48]	[1.99]	[0.77]	[1.60]
	0.199***	0.263***	0.166***	0.116**
EG_t	(0.060)	(0.059)	(0.055)	(0.054)
	[3.33]	[4.46]	[3.03]	[2.13]
	-0.886	-0.981	-0.750	-1.271**
EG_t^2	(0.633)	(0.614)	(0.606)	(0.641)
	[-1.40]	[-1.60]	[-1.24]	[-1.98]
	-0.004	-0.003	-0.005	-0.004
IR_t	(0.005)	(0.004)	(0.004)	(0.004)
	[-0.89]	[-0.77]	[-1.27]	[-0.81]
	0.016	0.015	0.024**	0.018
EA_t	(0.011)	(0.011)	(0.011)	(0.013)
	[1.43]	[1.40]	[2.23]	[1.45]
	-0.072	-0.031	-0.049	-0.102
GS_t	(0.086)	(0.085)	(0.086)	(0.093)
	[-0.85]	[-0.36]	[-0.56]	[-1.10]
	0.005	0.008	0.006	0.005
TO_t	(0.006)	(0.006)	(0.007)	(0.007)
	[0.81]	[1.35]	[0.82]	[0.70]
Short-term Coefficients				
	0.016***	0.012***	0.014***	0.020***
Constant	(0.005)	(0.005)	(0.005)	(0.006)
	[3.01]	[2.42]	[2.60]	[3.19]
	-0.253***	-0.252***	-0.257***	-0.279***
Error Correction Term$_t$	(0.023)	(0.023)	(0.023)	(0.026)
	[-11.04]	[-10.97]	[-11.11]	[-10.53]
	-0.005	-0.006***	0.002	0.001
ΔF_t	(0.004)	(0.003)	(0.002)	(0.002)
	[-1.25]	[-2.58]	[1.39]	[0.32]
	-0.005	-0.007	0.004	-0.007
ΔEG_t	(0.013)	(0.012)	(0.012)	(0.014)
	[-0.42]	[-0.56]	[0.30]	[-0.53]
	0.063	0.041	0.033	0.097
ΔEG_t^2	(0.117)	(0.112)	(0.115)	(0.126)
	[0.54]	[0.36]	[0.29]	[0.77]
	0.001	0.001	0.001	0.0003
ΔIR_t	(0.001)	(0.001)	(0.001)	(0.001)
	[0.74]	[1.34]	[1.36]	[0.26]
	-0.007	-0.007	-0.009	-0.011
ΔEA_t	(0.007)	(0.007)	(0.007)	(0.009)
	[-1.02]	[-1.07]	[-1.22]	[-1.27]
	-0.092**	-0.065	-0.079*	-0.161***
ΔGS_t	(0.045)	(0.045)	(0.046)	(0.052)
	[-2.03]	[-1.45]	[-1.71]	[-3.12]
	-0.0001	-0.001	-0.012	-0.002
ΔTO_t	(0.005)	(0.005)	(0.005)	(0.005)
	[-0.02]	[-0.30]	[-0.33]	[-0.35]
EG* (%)	n.a.	n.a.	n.a.	4.563
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A10 – Estimates for the linear model and for the net top 10% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	0.007	0.011**	-0.0001	0.014
F_t	(0.008)	(0.005)	(0.004)	(0.010)
	[0.92]	[2.07]	[-0.02]	[1.47]
	0.249***	0.396***	0.251***	0.161**
EG_t	(0.093)	(0.091)	(0.084)	(0.082)
	[2.69]	[4.37]	[2.97]	[1.96]
	-0.742	-1.446	-1.061	-0.907
EG_t^2	(0.985)	(0.944)	(0.932)	(0.968)
	[-0.75]	[-1.53]	[-1.14]	[-0.94]
	-0.008	-0.003	-0.006	-0.007
IR_t	(0.007)	(0.007)	(0.007)	(0.007)
	[-1.04]	[-0.40]	[-0.94]	[-1.12]
	0.017	0.014	0.026	0.022
EA_t	(0.018)	(0.017)	(0.016)	(0.019)
	[0.93]	[0.85]	[1.59]	[1.11]
	-0.114	-0.048	-0.086	-0.074
GS_t	(0.133)	(0.131)	(0.132)	(0.142)
	[-0.85]	[-0.37]	[-0.65]	[-0.52]
	0.010	0.014	0.015	0.005
TO_t	(0.010)	(0.010)	(0.011)	(0.010)
	[0.94]	[1.49]	[1.39]	[0.54]
Short-term Coefficients				
	0.064***	0.061***	0.064***	0.064***
Constant	(0.009)	(0.009)	(0.010)	(0.010)
	[6.75]	[6.42]	[6.53]	[6.34]
	-0.240***	-0.251***	-0.255***	-0.250***
Error Correction Term$_t$	(0.023)	(0.024)	(0.024)	(0.025)
	[-20.39]	[-10.63]	[-10.74]	[-10.10]
	-0.005	-0.008**	0.003	0.002
ΔF_t	(0.006)	(0.004)	(0.002)	(0.003)
	[-0.80]	[-2.09]	[1.40]	[0.80]
	-0.013	-0.02§	-0.007	-0.019
ΔEG_t	(0.019)	(0.019)	(0.019)	(0.019)
	[-0.71]	[-1.11]	[-0.36]	[-1.03]
	0.180	0.341	0.207	0.122
ΔEG_t^2	(0.173)	(0.172)	(0.175)	(0.171)
	[1.04]	[1.40]	[1.19]	[0.71]
	0.002	0.002	0.002	0.0004
ΔIR_t	(0.001)	(0.001)	(0.001)	(0.001)
	[1.16]	[1.26]	[1.40]	[0.30]
	-0.001	-0.001	-0.002	-0.003
ΔEA_t	(0.011)	(0.011)	(0.011)	(0.012)
	[-0.05]	[-0.06]	[-0.14]	[-0.24]
	-0.067	-0.026	-0.028	-0.226***
ΔGS_t	0.067	(0.007)	(0.071)	(0.071)
	[-1.00]	[-0.39]	[-0.39]	[-3.20]
	0.005	-0.0002	0.0005	0.002
ΔTO_t	(0.007)	(0.007)	(0.007)	(0.007)
	[0.66]	[-0.04]	[0.07]	[0.32]
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A11 – Estimates for the non-linear model and for the gross Gini

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
F_t	-0.020 (0.026) [-0.80]	-0.008 (0.023) [-0.32]	0.013 (0.017) [0.75]	0.006 (0.020) [0.30]
F_t^2	0.019* (0.011) [1.65]	0.006 (0.007) [0.83]	-0.001 (0.002) [-0.72]	0.009 (0.010) [0.91]
EG_t	0.351*** (0.118) [2.98]	0.413*** (0.114) [3.61]	0.279** (0.113) [2.46]	0.250*** (0.095) [2.63]
EG_t^2	-1.508 (1.241) [-1.22]	-1.844 (.1209) [-1.52]	-1.360 (1.242) [-1.09]	-0.988 (1.079) [-0.92]
IR_t	-0.007 (0.009) [-0.72]	-0.001 (0.009) [-0.17]	-0.005 (0.009) [-0.57]	-0.005 (0.007) [-0.65]
EA_t	0.022 (0.022) [0.98]	0.022 (0.021) [1.00]	0.024 (0.023) [1.08]	0.030 (0.022) [1.34]
GS_t	-0.259 (0.168) [-1.54]	-0.184 (0.165) [-1.11]	-0.217 (0.174) [-1.25]	0.027 (0.159) [0.17]
TO_t	0.015 (0.013) [1.23]	0.020 (0.012) [1.61]	0.015 (0.015) [1.00]	-0.001 (0.011) [-0.07]
Short-term Coefficients				
Constant	0.079*** (0.010) [7.53]	0.076*** (0.010) [7.64]	0.075*** (0.010) [7.52]	0.078*** (0.011) [7.08]
Error Correction Term$_t$	-0.169*** (0.020) [-8.45]	-0.172*** (0.019) [-8.65]	-0.168*** (0.019) [-8.71]	-0.190*** (0.021) [-9.00]
ΔF_t	-0.024** (0.012) [-1.98]	0.004 (0.008) [0.45]	-0.002 (0.003) [-0.72]	0.004 (0.004) [0.85]
ΔF_t^2	0.011** (0.005) [1.97]	-0.003 (0.002) -1.24	0.001* (0.0004) [1.72]	-0.0003 (0.002) [-0.21]
ΔEG_t	-0.0002 (0.017) [-0.01]	-0.002 (0.016) [-0.12]	0.004 (0.016) [0.22]	-0.019 (0.016) [-1.19]
ΔEG_t^2	0.127 (0.151) [0.84]	0.150 (0.147) [1.01]	0.133 (0.151) [0.88]	0.085 (0.144) [0.59]
ΔIR_t	0.001 (0.001) [0.71]	0.001 (0.001) [0.60]	0.001 (0.001) [0.70]	0.001 (0.001) [0.64]
ΔEA_t	0.0003 (0.009) [0.04]	-0.001 (0.009) [-0.10]	0.001 (0.009) [0.06]	0.001 (0.010) [0.12]
ΔGS_t	-0.053 (0.059) [-0.91]	-0.043 (0.059) [-0.73]	-0.046 (0.061) [-0.74]	-0.155*** (0.060) [-2.61]
ΔTO_t	-0.002 (0.006) [-0.26]	-0.003 (0.006) [-0.52]	-0.001 (0.006) [-0.16]	0.003 (0.006) [0.41]
F* (%)	n.a.	n.a.	n.a.	n.a.
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A12 – Estimates for the non-linear model and for the gross top 1% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	0.001	0.008	0.017*	0.004
F_t	(0.015)	(0.014)	(0.011)	(0.016)
	[0.06]	[0.55]	[1.64]	[0.28]
	0.008	0.001	-0.001	0.009
F_t^2	(0007)	(0.004)	(0.001)	(0.008)
	[1.16]	[0.22]	[-1.50]	[1.18]
	0.296***	0.348***	0.261***	0.192***
EG_t	(0.072)	(0.069)	(0.073)	(0.074)
	[4.12]	[5.01]	[3.56]	[2.58]
	-0.922	-1.149*	-0.689	-1.148
EG_t^2	(0.742)	(0.708)	(0.777)	(0.845)
	[-1.24]	[-1.62]	[-0.89]	[-1.36]
	-0.005	-0.001	-0.004	-0.004
IR_t	(0.006)	(0.005)	(0.006)	(0.006)
	[-0.90]	[-0.27]	[-0.74]	[-0.67]
	0.035**	0.033***	0.038***	0.035**
EA_t	(0.014)	(0.013)	(0.014)	(0.017)
	[2.55]	[2.60]	[2.67]	[2.05]
	-0.182*	-0.122	-0.116	-0.128
GS_t	(0.102)	(0.097)	(0.111)	(0.123)
	[-1.80]	[-1.25]	[-1.05]	[-1.04]
	-0.003	0.005	-0.005	-0.003
TO_t	(0.008)	(0.007)	(0.010)	(0.009)
	[0.968]	[0.64]	[-0.50]	[-0.38]
Short-term Coefficients				
	0.021***	0.017***	0.016***	0.020***
Constant	(0.006)	(0.005)	(0.006)	(0.006)
	[3.80]	[3.16]	[2.98]	[3.10]
	-0.223***	-0.223***	-0.210***	-0.217***
Error Correction Term$_t$	(0.021)	(0.021)	(0.021)	(0.024)
	[-10.49]	[-10.56]	[-10.11]	[-8.94]
	-0.023**	-0.001	-0.003	0.001
ΔF_t	(0.009)	(0.006)	(0.003)	(0.004)
	[-2.47]	[-0.18]	[-1.27]	[0.31]
	0.009**	-0.002	0.001**	0.0002
ΔF_t^2	(0.004)	(0.002)	(0.0003)	(0.001)
	[2.12]	[-1.14]	[2.26]	[0.11]
	-0.020	-0.020	-0.012	-0.025*
ΔEG_t	(0.013)	(0.013)	(0.013)	(0.014)
	[-1.48]	[-1.56]	[-0.93]	[-1.74]
	0.103	0.098	0.076	0.127
ΔEG_t^2	(0.120)	(0.114)	(0.120)	(0.128)
	[0.86]	[0.86]	[0.63]	[0.99]
	-0.0001	0.0001	0.0001	-0.0003
ΔIR_t	(0.001)	(0.001)	(0.001)	(0.001)
	[-0.08]	[0.13]	[0.09]	[-0.32]
	-0.007	-0.008	-0.008	-0.009
ΔEA_t	(0.007)	(0.007)	(0.007)	(0.009)
	[-1.01]	[-1.13]	[-1.11]	[-0.98]
	-0.132***	-0.116**	-0.139***	-0.200***
ΔGS_t	(0.047)	(0.045)	(0.049)	(0.053)
	[-2.83]	[-2.56]	[-2.87]	[-3.76]
	0.001	-0.001	-0.0001	0.003
ΔTO_t	(0.005)	(0.005)	(0.005)	(0.005)
	[0.23]	[-0.22]	[-0.01]	[0.48]
F*	n.a.	n.a.	n.a.	n.a.
EG*	n.a.	15.144	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A13 – Estimates for the non-linear model and for the gross top 10% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
	-0.019	-0.007	0.014	0.010
F_t	(0.024)	(0.021)	(0.016)	(0.021)
	[-0.80]	[-0.31]	[0.86]	[0.49]
	0.017*	0.006	-0.001	0.010
F_t^2	(0.010)	(0.006)	(0.001)	(0.010)
	[1.66]	[0.90]	[-0.74]	[0.93]
	0.354***	0.434***	0.298***	0.233**
EG_t	(0.109)	(0.105)	(0.106)	(0.098)
	[3.25]	[4.12]	[2.81]	[2.38]
	-0.691	-1.096	-0.629	-0.892
EG_t^2	(1.137)	(1.092)	(1.141)	(1.121)
	[-0.61]	[-1.00]	[-0.55]	[-0.80]
	-0.008	-0.002	-0.006	-0.006
IR_t	(0.009)	(0.008)	(0.008)	(0.008)
	[-0.96]	[-0.28]	[-0.71]	[-0.80]
	0.041**	0.037*	0.043**	0.038*
EA_t	(0.021)	(0.020)	(0.021)	(0.023)
	[1.96]	[1.87]	[2.04]	[1.64]
	-0.240	-0.163	-0.182	-0.082
GS_t	(0.156)	(0.151)	(0.162)	(0.165)
	[-1.54]	[-1.08]	[-1.12]	[-0.50]
	0.003	0.008	0.001	-0.005
TO_t	(0.012)	(0.011)	(0.014)	(0.012)
	[0.28]	[0.69]	[0.06]	[-0.42]
Short-term Coefficients				
	0.062***	0.059***	0.058***	0.061***
Constant	(0.009)	(0.008)	(0.009)	(0.010)
	[7.05]	[7.03]	[6.79]	[6.25]
	-0.184***	-0.186***	-0.183***	-0.198***
Error Correction Term$_t$	(0.019)	(0.019)	(0.019)	(0.022)
	[-9.51]	[-9.68]	[-9.69]	[-9.10]
	-0.025**	0.001	-0.003	0.004
ΔF_t	(0.012)	(0.008)	(0.003)	(0.005)
	[-2.12]	[0.17]	[-0.86]	[0.75]
	0.011**	-0.003	0.001*	0.000
ΔF_t^2	(0.005)	(0.002)	(0.017)	(0.002)
	[1.96]	[-1.31]	[-0.66]	[0.00]
	-0.017	-0.019	-0.011	-0.031*
ΔEG_t	(0.017)	(0.016)	(0.017)	(0.017)
	[-0.99]	[-1.14]	[-0.66]	[-1.79]
	0.115	0.125	0.117	0.119
ΔEG_t^2	(0.153)	(0.147)	(0.153)	(0.156)
	[0.75]	[0.85]	[0.76]	[0.76]
	0.0004	0.0004	0.0004	0.0002
ΔIR_t	(0.001)	(0.001)	(0.001)	(0.001)
	[0.33]	[0.31]	[0.33]	[0.16]
	-0.004	-0.005	-0.004	-0.003
ΔEA_t	(0.009)	(0.009)	(0.009)	(0.011)
	[-0.42]	[-0.54]	[-0.43]	[-0.31]
	-0.094	-0.084	-0.093	-0.195***
ΔGS_t	(0.059)	(0.059)	(0.062)	(0.065)
	[-1.59]	[-1.43]	[-1.49]	[-3.01]
	0.002	-0.001	0.001	0.004
ΔTO_t	(0.006)	(0.006)	(0.006)	(0.007)
	[0.29]	[-0.15]	[0.15]	[0.55]
F*	n.a.	n.a.	n.a.	n.a.
EG*	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A14 – Estimates for the non-linear model and for the net Gini

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
F_t	-0.001 (0.022) [-0.03]	-0.008 (0.026) [-0.31]	-0.002 (0.014) [-0.11]	0.014 (0.017) [0.83]
F_t^2	0.001 (0.010) [0.06]	0.005 (0.008) [0.64]	0.0001 (0.001) [0.09]	0.001 (0.008) [0.09]
EG_t	0.143 (0.101) [1.41]	0.310** (0.008) [2.47]	0.143 (0.092) [1.55]	0.108 (0.076) [1.42]
EG_t^2	-0.634 (1.085) [-0.58]	-1.735 (1.340) [-1.29]	-0.890 (1.103) [-0.88]	-0.453 (0.892) [-0.51]
IR_t	-0.008 (0.008) [-0.94]	-0.006 (0.010) [-0.60]	-0.011 (0.007) [-1.55]	-0.006 (0.006) [-0.98]
EA_t	0.004 (0.020) [0.19]	-0.001 (0.024) [-0.02]	0.008 (0.019) [0.45]	0.009 (0.018) [0.47]
GS_t	-0.113 (0.149) [-0.76]	-0.093 (0.185) [-0.51]	-0.174 (0.144) [-1.21]	0.045 (0.132) [0.34]
TO_t	0.022* (0.011) [1.94]	0.021 (0.014) [1.55]	0.026** (0.013) [2.05]	0.013 (0.009) [1.36]
Short-term Coefficients				
Constant	0.101*** (0.013) [7.48]	0.078*** (0.013) [6.12]	0.108*** (0.013) [8.09]	0.113*** (0.014) [8.00]
Error Correction Term$_t$	-0.288*** (0.027) [-10.49]	-0.220*** (0.027) [-8.24]	-0.304*** (0.027) [-11.22]	-0.358*** (0.029) [-12.20]
ΔF_t	-0.003 (0.018) [-0.19]	0.006 (0.012) [0.48]	-0.0002 (0.005) [-0.04]	0.001 (0.007) [0.14]
ΔF_t^2	0.001 (0.008) [0.18]	-0.004 (0.003) [-1.21]	0.001 (0.025) [0.37]	0.0003 (0.003) [0.13]
ΔEG_t	0.007 (0.025) [0.29]	0.0002 (0.024) [0.01]	0.009 (0.025) [0.37]	-0.020 (0.025) [-0.78]
ΔEG_t^2	0.226 (0.229) [0.99]	0.319 (0.213) [1.49]	0.287 (0.227) [1.27]	0.181 (0.226) [0.80]
ΔIR_t	0.001 (0.002) [0.72]	0.001 (0.002) [0.50]	0.002 (0.002) [1.13]	0.0004 (0.002) [0.20]
ΔEA_t	0.004 (0.014) [0.26]	0.001 (0.013) [0.05]	0.005 (0.014) [0.35]	0.007 (0.016) [0.42]
ΔGS_t	-0.118 (0.089) [-1.33]	-0.088 (0.085) [-1.03]	-0.058 (0.092) [-0.63]	-0.274*** (0.094) [-2.93]
ΔTO_t	-0.005 (0.009) [-0.54]	-0.006 (0.009) [-0.65]	-0.007 (0.009) [-0.74]	-0.002 (0.010) [-0.21]
F* (%)	n.a.	n.a.	n.a.	n.a.
EG* (%)	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A15 – Estimates for the non-linear model and for the net top 1% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
F_t	-0.002 (0.013) [-0.15]	0.007 (0.012) [0.62]	0.007 (0.008) [0.78]	-0.010 (0.012) [-0.87]
F_t^2	0.004 (0.006) [0.75]	-0.0002 (0.003) [-0.05]	-0.0005 (0.001) [-0.61]	0.011* (0.006) [1.94]
EG_t	0.206*** (0.060) [3.41]	0.263*** (0.059) [4.42]	0.163*** (0.056) [2.91]	0.128** (0.055) [2.32]
EG_t^2	-0.843 (0.632) [-1.33]	-1.011* (0.614) [-1.65]	-0.758 (0.607) [-1.25]	-1.280* (0.644) [-1.99]
IR_t	-0.006 (0.005) [-1.18]	-0.003 (0.004) [-0.71]	-0.006 (0.004) [-1.40]	-0.004 (0.004) [-0.90]
EA_t	0.018 (0.012) [1.52]	0.015 (0.011) [1.40]	0.022* (0.011) [1.95]	0.025* (0.013) [1.91]
GS_t	-0.078 (0.087) [-0.90]	-0.033 (0.085) [-0.39]	-0.053 (0.086) [-0.62]	-0.077 (0.094) [-0.82]
TO_t	0.006 (0.006) [0.91]	0.009 (0.006) [1.38]	0.004 (0.008) [0.54]	0.004 (0.007) [0.59]
Short-term Coefficients				
Constant	0.016*** (0.005) [3.05]	0.012*** (0.005) [2.29]	0.014*** (0.005) [2.67]	0.017*** (0.006) [2.86]
Error Correction Term$_t$	-0.253*** (0.023) [-11.06]	-0.252*** (0.023) [-10.99]	-0.256*** (0.023) [-11.11]	-0.277*** (0.026) [-10.48]
ΔF_t	-0.015* (0.009) [-1.66]	-0.001 (0.006) [-0.09]	-0.003 (0.003) [-0.97]	-0.001 (0.004) [-0.29]
ΔF_t^2	0.005 (0.004) [1.26]	-0.002 (0.002) [-1.06]	0.001** (0.0003) (2.29)	0.0004 (0.001) [0.28]
ΔEG_t	-0.006 (0.012) [-0.49]	-0.006 (0.012) [-0.51]	0.004 (0.012) [0.34]	-0.009 (0.014) [-0.63]
ΔEG_t^2	0.055 (0.117) [0.47]	0.044 (0.112) [0.39]	0.029 (0.115) [0.25]	0.093 (0.125) [0.74]
ΔIR_t	0.001 (0.001) [0.77]	0.001 (0.001) [1.16]	0.001 (0.001) [1.41]	0.0003 (0.001) [0.33]
ΔEA_t	-0.008 (0.007) [-1.05]	-0.008 (0.007) [-1.08]	-0.008 (0.007) [-1.20]	-0.013 (0.009) [-1.48]
ΔGS_t	-0.095** (0.045) [-2.09]	-0.062 (0.045) [-1.39]	-0.078* (0.046) [-1.68]	-0.165*** (0.052) [-3.18]
ΔTO_t	-0.0001 (0.005) [3.05]	-0.002 (0.005) [2.29]	-0.002 (0.005) [-0.48]	-0.002 (0.005) [-0.41]
F*	n.a.	n.a.	n.a.	n.a.
EG*	n.a.	n.a.	n.a.	5.000
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	1.000	1.000	1.000	1.000
Estimator	DFE	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level

Table A16 – Estimates for the non-linear model and for the net top 10% income share

Variable	Credit	Credit-to-Deposit Ratio	Liquid Liabilities	Stock Market Capitalisation
Long-term Coefficients				
F_t	-0.004 (0.020) [-0.20]	0.014 (0.018) [0.76]	0.001 (0.013) [0.10]	-0.002 (0.018) [-0.12]
F_t^2	0.005 (0.009) [0.58]	-0.001 (0.005) [-0.17]	-0.0001 (0.001) [-0.13]	0.009 (0.009) [1.01]
EG_t	0.259*** (0.094) [2.77]	0.396*** (0.091) [4.25]	0.242*** (0.086) [2.80]	0.170** (0.084) [2.03]
EG_t^2	-0.685 (0.984) [-0.70]	-1.517 (0.940) [-1.61]	-1.058 (0.932) [-1.14]	-0.908 (0.972) [-0.93]
IR_t	-0.010 (0.018) [1.00]	-0.002 (0.007) [-0.31]	-0.007 (0.007) [-1.06]	-0.008 (0.007) [-1.17]
EA_t	0.018 (0.018) [1.00]	0.014 (0.017) [0.85]	0.025 (0.017) [1.48]	0.027 (0.020) [1.34]
GS_t	-0.120 (0.136) [-0.88]	-0.052 (0.130) [-0.40]	-0.089 (0.132) [-0.67]	-0.055 (0.144) [-0.38]
TO_t	0.010 (0.010) [1.02]	0.015 (0.010) [1.56]	0.015 (0.012) [1.25]	0.005 (0.010) [0.47]
Short-term Coefficients				
Constant	0.065*** (0.010) [6.69]	0.061*** (0.010) [6.25]	0.064*** (0.010) [6.58]	0.063*** (0.010) [6.15]
Error Correction Term$_t$	-0.241*** (0.023) [-10.41]	-0.252*** (0.024) [-10.66]	-0.255*** (0.024) [-10.72]	-0.249*** (0.025) [-10.06]
ΔF_t	-0.018 (0.014) [-1.34]	0.006 (0.010) [0.63]	-0.002 (0.004) [-0.39]	-0.001 (0.005) [-0.15]
ΔF_t^2	0.007 (0.006) [1.12]	-0.005* (0.003) [-1.64]	0.001* (0.0004) [1.64]	0.001 (0.002) [0.53]
ΔEG_t	-0.015 (0.019) [-0.77]	-0.020 (0.019) [-1.04]	-0.005 (0.019) [-0.28]	-0.020 (0.019) [-1.08]
ΔEG_t^2	0.170 (0.173) [0.98]	0.250 (0.172) [1.45]	0.203 (0.175) [1.16]	0.118 (0.171) [0.69]
ΔIR_t	0.002 (0.001) [1.18]	0.001 (0.001) [1.00]	0.002 (0.001) [1.46]	0.0005 (0.001) [0.34]
ΔEA_t	-0.001 (0.011) [-0.07]	-0.001 (0.011) [-0.08]	-0.002 (0.011) [-0.14]	-0.004 (0.012) [-0.35]
ΔGS_t	-0.070 (0.067) [-1.05]	-0.020 (0.068) [-0.29]	-0.025 (0.071) [-0.36]	-0.230*** (0.071) [-3.25]
ΔTO_t	0.005 (0.007) [0.67]	-0.001 (0.007) [-0.10]	-0.0003 (0.010) [-0.04]	0.002 (0.007) [0.27]
F*	n.a.	n.a.	n.a.	n.a.
EG*	n.a.	n.a.	n.a.	n.a.
Hausman Test (MG vs DFE)	1.000	1.000	1.000	1.000
Hausman Test (PMG vs DFE)	0.000	0.000	0.000	0.000
Estimator	DFE or PMG	DFE	DFE	DFE

Note: Standard errors in ( ), z-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level