FUNCTIONAL INCOME DISTRIBUTION IN PORTUGAL: THE ROLE OF FINANCIALISATION AND OTHER RELATED DETERMINANTS

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ABSTRACT

This paper makes an empirical analysis of the relationship between the labour income share and both financialisation and other related variables in Portugal from 1978 to 2012. We estimate an equation for the labour share that includes standard variables (technological progress, globalisation, education and business cycle) and variables to capture the effect of financialisation. We formulate the hypothesis that the financialisation process may lead to a rise in the inequality of functional income distribution through three channels: the change in the sectorial composition of the economy (due to both the increase in the weight of the financial activity and the decrease in government activity), the diffusion of shareholder value governance practices and the weakening of trade unions. Our results show that the financialisation process as an indirect long-term effect on the labour share through its impact on government activity and trade union density. The paper also finds evidence supporting the traditional explanations for functional income distribution, namely globalisation, education and business cycle.

KEYWORDS

Financialisation, Inequality, The Portuguese Functional Income Distribution, Cointegration, ARDL Models

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C22, D33 and E44

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1. INTRODUCTION

Although conventional economic theory states that labour share and profit share are constant in the long-term (Keynes 1939; Solow 1958; and Kaldor 1961), profit share has increased in the major advanced economies since the early 1980s, accompanied by the corresponding fall in the labour share (Stockhammer 2009 and 2012; Kristal 2010; Peralta – Escalonilla 2011; Dünhaupt 2011; Estrada – Valdeolivas 2012; and Lin – Tomaskovic-Devey 2013). The fall in the labour share may lead to the rise in inequality of personal incomes (Karanassou – Sala 2013), exacerbate social strains (Dünhaupt 2011), and trigger a reduction in aggregate demand in the medium- and long-term (Naastepaad – Storm 2007; Hein – Vogel 2008; Stockhammer 2012; and Dünhaupt 2013a).

The financial sector has acquired great importance in most developed economies, a phenomenon sometimes termed financialisation (e.g. Krippner 2005; Epstein 2005). Hein (2012) stresses that financialisation decreases labour share through three channels: the change in the sectorial composition of the economy (weight of the financial sector and the size of government activity), the emergence of the "shareholder value orientation" paradigm, and the weakening of the trade unions' power.

A small body of literature has emerged in recent years to test the effect of financialisation on labour share. Most of these studies derive and estimate an equation for that share, finding statistical evidence that financialisation has caused a decline in the labour share and thus a rise in profit share (e.g. Stockhammer 2009; Kristal 2010; Peralta – Escalonilla 2011; Dünhaupt 2013a; Karanassou – Sala 2013; Lin – Tomaskovic-Devey 2013; and Alvarez 2015).

As illustrated by Figure A1 in the Appendix, Portugal is not an exception to the global downward trend in the labour share since the 1980s, although the evolution has not been uniform (Lagoa et al. 2014). Our goal is to analyse whether the trend toward finance-dominated capitalism played a role in the evolution of the labour share.

As seen above, financialisation has both a direct and indirect impact on labour share, with the latter working through the size of the public sector and trade unions' power. Consequently, we need to take other key variables into account when studying how financialisation affects functional income. This paper therefore aims to evaluate the impact of financialisation and other related variables (government activity and trade union power) on functional income distribution in Portugal between 1978 and 2012. It should be noted that, as we analyse the unequal distribution of income across production factors, inequality rises when the labour share decreases and profit share increases.

The paper contributes to the literature in two ways. First, whereas most studies address large, developed and highly financialised economies, this paper focuses on the less financialised Portuguese economy. Second, the paper uses a time series econometric analysis, distinguishing

between short-term and long-term effects of financialisation, and thus differs from most empirical studies which conduct a panel data analysis. This provides a better understanding of the historical, social and economic circumstances that are responsible for the evolution in functional income distribution.

Portugal is an interesting case study because the financial sector enjoyed considerable growth after the 1980s but was followed by a sovereign debt crisis in 2011. Financialisation is not so developed in Portugal as in the USA or the UK and it is characterised by the dominance of banks. The vast majority of firms are small and medium, not quoted in the stock market and mostly use banking credit as their source of financing. As a whole, rentiers probably exert less pressure through financial markets than in other countries; however, the pressure exerted by shareholders at the annual general meeting and by the management board of non-quoted firms cannot be ignored. A systematic analysis of the financialisation process in Portugal can be found in Barradas et al. (2015) and in Rodrigues et al. (2016).

Results indicate that the financialisation process conditioned the evolution of the labour share, notably through the channels of government activity and trade unions. This suggests that financialisation also affects the functional income distribution in smaller, less developed, less financialised and more peripheral economies. Moreover, we find support for the traditional explanations of the labour share, such as globalisation, technological progress, education and business cycle.

The remainder of the paper is organised as follows. Section 2 presents a short literature review on the relationship between financialisation and functional income distribution. In Section 3, we describe the variables included in the labour share model. In Section 4, we explain the data and the econometric methodology. The main results, discussion and policy implications are provided in Section 5. Finally, Section 6 concludes.

2. THE RELATIONSHIP BETWEEN FINANCIALISATION AND FUNCTIONAL INCOME DISTRIBUTION

It is widely acknowledged that the well-being of a society depends on a fair income distribution. Conventional economic theory postulates that the growth of finance is in general a positive phenomenon, increasing the provision of funding (by channelling savings to borrowers through credit and other forms) and thus boosting economic growth (Levine 2005). The development of the financial sector and financial markets also provides access to funding for poorer economic agents, contributing to a more entrepreneurial stance and to the reduction of social and income disparities (Czaplicki – Wieprzowski 2013).

Nevertheless, some authors claim that financialisation leads to an increase in functional income distribution inequality. According to the Kaleckian perspective[1], as theoretically discussed by Hein (2012) – Figure 1, this is explained by three different channels (and various sub-channels), which we explain below.

Figure 1 – The effects of financialisation on inequality of functional income distribution (decrease in labour income share)

Inequality of income distribution	**Change in sectorial composition**	Increasing importance of finance Downsizing of government activity
	"Shareholder value orientation"	Rise in top management salaries Rise in the profit claims of rentiers
	Weakening of trade unions	"Shareholder value orientation" Increasing importance of finance Downsizing activity of public sector Deregulation of labour markets Liberalisation and globalisation

Source: Authors' representation based on Hein (2012), Hein and Detzer (2014), Michell (2014), Hein and Dodig (2015), among others

The first channel through which financialisation can affect labour share is related with a change in the sectorial composition of the economy, and it operates through two sub-channels: the increasing importance of the financial sector in relation to the non-financial sector in terms of value added, and the decreasing weight of government activity.

On one hand, Hein (2012) recognises that the growth of the financial sector raises economy-wide gross profit share because its wage share is smaller than that of the non-financial sector. In this regard, Kus (2012) adds that the expansion of finance means a decline in the profitability of the non-financial sector, which in turn implies a contraction of middle-class and blue-collar wages in that sector. In addition, the growth of the financial sector has contributed to the weakening of policies and institutions that mitigate the effects of inequality, such as trade unions and/or minimum wage laws.

On the other hand, Hein (2012) and Dünhaupt (2013a) admit that the downsizing of government activity also fosters a reduction in the economy-wide labour share, because the government is a "non-profit" sector in the national accounts and therefore has no capital income. Dünhaupt (2013b) reiterates that privatisations of public corporations are also associated with a decline in the labour share, as they have a smaller profit share than private

[1] Stockhammer (2009) notes that different schools of thought provide various explanations of income distribution. Neoclassical economics emphasises the role of technology and preferences, Keynesian/Kaldorian economics highlights the importance of aggregate demand, and Marxian economics evoke the relative power relations in class struggle. According to Stockhammer (2009), these theories are only applied in a highly restrictive long-term equilibrium of a closed economy characterised by full capacity utilisation. They cannot be used to analyse the medium-term changes in income distribution of economies where capacity is underutilised and that are open to trade and international capital. These caveats are our main reasons for following the Kaleckian perspective.

firms. The reduction in government activity (either directly or through public firms) is in part explained by the financialisation logic, which aims to extend market interests to areas previously under the control of the public sector.

The second channel involves the increase in top management salaries together with a rise in the profit demands of rentiers. This is explained by the emergence of a new design of corporate governance ("shareholder value orientation") (Crotty 1990; Aglietta 2000; Lazonick – O'Sullivan 2000; Stockhammer 2010; Dünhaupt 2011; Hein 2012; Kus 2012; and van der Zwan 2014). The "neoliberal paradox" means that shareholders force firms to remain competitive and profitable even in downturn environments (Crotty 2005). D'Estaing (2003) stresses that the rise in managerial wages aims to attract the most talented top managers who contribute to the success and profitability of firms. However, he does not support this practice, especially when managerial wages are linked to stock market gains of the firm that do not depend exclusively on managerial talent. According to Hein (2012), the decline in the labour share was not larger because top management salaries are included in the labour share.

Finally, the third channel is associated with the weakening of trade unions and, therefore, with the lower bargaining power of workers. The argument is that a higher bargaining power of workers leads to an increase in wages (Stockhammer 2009). Hein (2012) notes five specific sub-channels responsible for this.

First, the "shareholder value orientation" makes firms seek profits (notably interest, dividends and capital gains) in financial rather than productive activities (Orhangazi 2008; Hein 2012; among others); this has an adverse impact on employment and therefore weakens trade unions. Moreover, enterprises try to increase short-term profits by reducing the power of trade unions.

Second, the growth of the financial vis-a-vis the non-financial sector has also weakened trade unions as they are traditionally stronger in the non-financial sector, notably manufacturing.

Third, the downsizing of the government sector has impaired trade union power as there is a high level of unionisation among public servants. Inflation targeting policy by central banks often implies the adoption of fiscal austerity measures that restrain the government's ability to mitigate inequalities (Kus 2012). It may also depress aggregate demand with negative effects on employment, which in turn constrains bargaining for higher wages.

Fourth, the trade unions' bargaining power has been undermined by the deregulation of labour markets since the 1980s. Most liberalisation measures have focused on reducing the level and duration of unemployment benefits, decreasing employment protection, and decentralising wage bargaining (Stockhammer 2004).

Fifth, workers' bargaining power has been hampered by liberalisation and globalisation due to the "threat" by corporations of using outsourcing and relocating production to low-wage countries (Hein 2012); the shift of several manufacturing firms to low-cost economies and their

replacement with service sector firms (normally less unionised) – Dünhaupt (2013a); the growth of multinational corporations where labour has a weaker position than in national corporations – Dünhaupt (2013a); and the globalisation of the US non-financial corporations, which has implied higher levels of financialisation and fostered cost-reducing and flexibility strategies – Milberg (2008). Zamagni (2003) states that firms are becoming "nomadic", because they are not rooted in a particular country, decreasing their sense of responsibility towards local communities, employees and other stakeholders.

Trade unions and the downsizing of government activity are indirect channels through which financialisation affects labour share, as they are indirectly affected by the growth of finance. Financialisation leads to a decline in the importance of the public sector and trade unions' power, which in turn reduces the labour share. In contrast, the channel of the increasing importance of the financial sector as well as the shareholder orientation channel offer a direct link between financialisation and functional income distribution.

Other explanations of functional income distribution focus on the role of technological progress (Stockhammer 2009; Estrada – Valdeolivas 2012; Guerriero – Sen 2012; Dünhaupt 2013a; Lin – Tomaskovic-Devey 2013; among others); labour market and product market policies and privatisations (Dünhaupt 2013a); and indicators of the political sphere (i.e., left government and civilian spending – Kristal 2010).

Despite the increasing amount of theoretical work on the effects of financialisation on functional income distribution, there are few empirical studies, as noted by Peralta – Escalonilla (2011), Dünhaupt (2011 and 2013a) and Alvarez (2015). Nevertheless, a relatively small body of empirical literature has emerged in recent years estimating labour share equations to assess the impact of financialisation on functional income distribution. Most of these studies find statistical evidence supporting the theoretical claim that financialisation leads to a decline in the labour share.

The large majority of studies resort to panel data analysis, either at the country or firm level (Stockhammer 2009; Kristal 2010; Peralta – Escalonilla 2011; Dünhaupt 2013a; Lin – Tomaskovic-Devey 2013; and Alvarez 2015). Judzik – Sala (2013) and Karanassou – Sala (2013) are exceptions as they use time series, but they do not directly study the impact of financialisation on functional income distribution. Estimations with panel data obtain an average effect for a set of countries, ignoring the historical, social and economic country-specific circumstances (Kristal 2010; Dünhaupt 2013a; and Judzik – Sala 2013). Our work tries to overcome this shortcoming by using time series data for Portugal.

In contrast with the literature that has focused mainly on large and highly developed economies, we make an empirical analysis of functional income distribution in a smaller, less developed and more peripheral economy.

Portugal's financialisation process has specific characteristics (Barradas et al. 2015; and Rodrigues et al. 2016), and not all variables evolved in line with what is expected in an increasingly financialised economy; more specifically there was not a clear upward trend in financial activity (Figure A6 in the Appendix) or in financial payments by non-financial firms (Figure A8 in the Appendix), and there was a clear upward trend in government activity (Figure A7 in the Appendix). However, the importance of trade unions has declined sharply since the 1980s (Figure A9 in the Appendix) in keeping with the characteristics of an increasingly financialised economy.

3. FINANCIALISATION AND FUNCTIONAL INCOME DISTRIBUTION: AN ECONOMIC MODELISATION

In what follows, we estimate an equation where the total labour share of the economy is a function of standard variables: technological progress, globalisation, education and the business cycle. Moreover, we capture the effects of financialisation on labour share through the three abovementioned channels by introducing four additional variables: size of financial sector, government activity, shareholder orientation and trade union membership.

The long-term labour share equation therefore takes the following form:

$$LS_t = \beta_0 + \beta_1 TP_t + \beta_2 GL_t + \beta_3 ED_t + \beta_4 BC_t + \beta_5 FA_t + \beta_6 GA_t + \beta_7 SO_t + \beta_8 TU_t + \eta_t \quad \textbf{(1)}$$

, where LS is the labour share, TP is technological progress, GL is globalisation, ED is the level of education, BC is the business cycle, FA is financial activity, GA is government activity, SO is shareholder orientation, TU is the weight of trade unions and η_t is an independent and identically distributed (white noise) disturbance term with null average and constant variance (homoscedastic).

It is worth noting that we will estimate an aggregate labour share function, as Stockhammer (2009), Kristal (2010), Peralta – Escalonilla (2011), Dünhaupt (2013a) and Karanassou – Sala (2013). This introduces some limitations; notably, it prevents the study of the differentiated effects of financialisation on industries and firms (of different size and ownership). This implies that we are not able to analyse whether financialisation has had a more intense effect on some firms, such as large firms or firms quoted in the stock market. However, the advantage of the macro perspective is that the impact of the phenomenon on the aggregate of workers can be studied. Nonetheless, if financialisation variables are found to have an effect, we are unable to say whether this is only due to some industries and large firms or if it is a

generalised phenomenon. Moreover, if the financialisation variables are found to have no macroeconomic effect, we cannot rule out a subset of workers from some industries or large size firms being affected, albeit not sufficiently to generate a macroeconomic effect.

The coefficients of the independent variables are expected to have the following signs:

$$\beta_1 < 0, \beta_2 < 0, \beta_3 > 0, \beta_4 \gtrless 0, \beta_5 < 0, \beta_6 > 0, \beta_7 < 0, \beta_8 > 0 \quad \textbf{(2)}$$

Technological progress is negatively related with the labour share, because it has become capital augmenting since the early 1980s but was labour augmenting in the 1960s and 1970s (Stockhammer 2009; Guerriero – Sen 2012; and Dünhaupt 2013b). Technological progress has functioned as a complement to high-skilled labour and a substitute to low-skilled labour (European Commission 2007). This has resulted in an increase in the labour share of high-skilled labour that does not compensate for the decrease in the labour share of the low-skilled labour, and thus has caused a fall in the labour share as a whole.

The degree of globalisation is also expected to be negatively related with the labour share. The Stolper-Samuelson (1941) theorem postulates that trade raises the return on the factor that is relatively abundant (capital in the case of developed countries) and lowers the return on the other factor (labour in the case of developing countries) – Guerriero – Sen (2012) and Dünhaupt (2013b). Furthermore, the deterioration in the bargaining power of workers, discussed in the previous section, is another important effect of globalisation that lowers the labour share.

The labour share depends positively on the labour force's education, given its positive effect on wages and employment (Guerriero – Sen 2012). Diwan (2000) and Daudey and García-Peñalosa (2007) confirm this hypothesis, especially for rich countries.

Meanwhile, the business cycle may have a positive or a negative coefficient. On one hand, the labour share tends to increase in recessions and decrease in times of recovery (Dünhaupt 2013a and 2013b). Willis – Wroblewski (2007) offer three potential explanations for the countercyclical behaviour of the labour share: wages are sluggish; firms delay employment adjustments due to the costs of firing and hiring workers given the uncertainty in the business cycle; and workers refrain from demanding wage increases in exchange for wage security in downturns. On the other hand, according to Estrada – Valdeolivas (2012), the business cycle may positively influence the labour share, reflecting the traditional relationship between the business cycle and unemployment. They argue that when the demand pressures are high (low), the risk of unemployment is reduced (increased) and wages tend to rise (fall) jointly with employment, as suggested by the Phillips Curve.

Finally, the financialisation variables are expected to be related with the labour share as discussed in the previous section: the labour share depends negatively on the weight of financial

activity and shareholder orientation, but positively on government activity and trade union representativeness.

4. DATA AND METHODOLOGY: THE ECONOMETRIC FRAMEWORK

4.1. DATA

In order to analyse the relationship between financialisation and functional income distribution in Portugal, we use annual data between 1978 and 2012. Data for this period and frequency are suitable for the study for two reasons. First, the financialisation phenomenon became more preponderant in Portugal during the 1990s (Lagoa et al. 2013), and so the sample includes periods of stable growth of financialisation and periods of strong growth. Second, the fall in the labour share is a long-term structural phenomenon, and therefore annual data is likely to capture it better than higher frequency data.

Regarding the definition of data, we use the adjusted labour share[2] of the total economy as a percentage of the gross domestic product from AMECO. The adjusted labour share corresponds to the ratio between the compensation per employee and the gross domestic product at current market prices per employee.

Since the dependent variable, the labour share, is expressed as a ratio, all independent variables (globalisation, education, business cycle, financial activity, government activity, shareholder orientation and trade union) are also expressed as ratios, except technological progress, which is expressed as a growth rate.

We use the usual variable of growth in total factor productivity of the whole economy at 2005 market prices as a proxy of technological progress, available on AMECO database (series number 8.2. – code ZVGDF). This variable is expressed as the difference between the growth rate of GDP and the growth rates of labour and capital weighted by their respective shares of total income. Total factor productivity summarises the use of inputs and their technological level. Globalisation is proxied by the level of an economy's openness: the sum of exports and imports divided by the gross domestic product at current market prices - variables collected from the Portuguese National Accounts (at current prices and in million of euros)[3].

The rate of upper-secondary schooling from PORDATA database is used to proxy education, and was the only education-related variable available for the entire period. This

[2] Note that this measure of labour share includes both dependent and self-employed workers. We use the *adjusted* labour share to circumvent the bias related with the fact that the earnings of self-employed are treated as labour income in certain cases and as capital income in others (Dünhaupt 2013a).

[3] Even though this proxy of globalisation is only related with international trade, our assumption is that it is correlated with other dimensions of the phenomenon, notably foreign direct investment.

variable is the ratio between the number of students enrolled in upper-secondary cycle with the usual age for that study cycle, and the total resident population for the same age group.

The business cycle is described by the output gap obtained as the difference between actual and potential GDP at 2005 market prices (as a percentage of GDP), from AMECO (series number 6.5. – code AVGDGP). Output gap is computed using a production function approach (Denis et al., 2002).

The proxy for financial activity is the gross value added of the financial sector (activities classified under category K according to the Eurostat NACE classification) divided by the gross value added of the economy (both at current prices and in million of euros), from PORDATA database and Eurostat respectively.

Meanwhile, the level of government activity is measured by the total general government expenditure as a percentage of GDP at current market prices from AMECO.

The proxy for firms' shareholder orientation is the sum of interest and distributed income of enterprises (where dividends are included) paid by non-financial enterprises divided by the gross value added of these enterprises. These variables were obtained from the Portuguese National Accounts (at current prices and in million of euros), available at *Instituto Nacional de Estatística*.

The importance of trade unions is described using the usual variable of trade union density from the Labour Force Statistics (OECD). This variable corresponds to the ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners[4]. Tables A1 and A2 in the Appendix contain descriptive statistics of the data and the correlation matrix, respectively.

4.2. METHODOLOGY

As we will see in the next section, our set of variables includes those integrated of order zero and one. Consequently, we apply the methodology of Autoregressive Distributed Lag (ARDL) models proposed by Pesaran (1997) and further extended by Pesaran – Shin (1999) and Pesaran et al. (2001); this has the advantage of not requiring the same order of integration for all variables, as it can be applied with a mixture of variables integrated of order zero and one. An additional advantage of this technique is that it is more suitable for small samples.

We proceed with five steps. First, we conduct unit root tests applying the augmented Dickey – Fuller (1979) (ADF) test and the Phillips – Perron (1998) (PP) test, in order to assess the order of integration of each variable and exclude the existence of variables integrated of order two as these cannot be included in an ARDL model.

[4] Nevertheless, as emphasised by Bassanini – Duval (2006) and OECD (2006), this proxy tends to underestimate the bargaining power of workers, insofar as the number of trade union members is normally much lower than the workers covered by collective bargaining agreements.

The second step is to estimate the ARDL model; this explains the behaviour of the dependent variable by both its lagged values and by the contemporaneous and lagged values of the independent variables. An ARDL ($p,q_1,q_2,...,q_k$) can be represented by (Pesaran – Pesaran 2009):

$$\phi(L,p)y_t = \sum_{i=1}^{k}\beta_i(L,q_i)x_{it} + \delta' w_t + u_t \quad \textbf{(3)}$$

, where:

$$\phi(L,p) = 1 - \phi_1 L - \phi_2 L^2 - ... - \phi_p L^p \quad \textbf{(4)}$$

$$\beta_i(L,q_i) = \beta_{i0} + \beta_{i1}L + ... + \beta_{iq_i}L^{q_i}, i = 1,2,...k \quad \textbf{(5)}$$

Note that y_t is the dependent variable, x_{it} is an independent variable, L is a lag operator such that $Ly_t = y_{t-1}$, and w_t is a $s \times 1$ vector of deterministic variables, like the intercept term, seasonal dummies, time trends or exogenous variables with fixed lags.

The error correction model associated with the ARDL ($\hat{p},\hat{q}_1,\hat{q}_2,...,\hat{q}_k$) model can be obtained by writing the expression (3) in terms of the lagged values and first differences of $y_t, x_{1t}, x_{2t},...,x_{kt}$ and w_t, which could be represented as:

$$\Delta y_t = -\phi(1,\hat{p})EC_{t-1} + \sum_{i=1}^{k}\beta_{i0}\Delta x_{it} + \delta'\Delta w_t - \sum_{j=1}^{\hat{p}-1}\phi_j^*\Delta y_{t-j} - \sum_{i=1}^{k}\sum_{j=1}^{\hat{q}_i-1}\beta_{ij}^*\Delta x_{i,t-j} + u_t \quad \textbf{(6)}$$

, where EC_t is the error correction term defined by:

$$EC_t = y_t - \sum_{i=1}^{k}\hat{\theta}_i x_{it} - \hat{\psi}' w_t \quad \textbf{(7)}$$

Note that $\phi(1,\hat{p}) = 1 - \hat{\phi}_1 - \hat{\phi}_2 - ... - \hat{\phi}_{\hat{p}}$ measures the quantitative importance of the error correction term. The remaining coefficients, ϕ_j^* and β_{ij}^*, relate to the short-term dynamics of the model's convergence to equilibrium.

We then analyse whether there is a cointegration relationship between our variables, by conducting a traditional Wald test on $\phi(1,\hat{p})$. Nonetheless, as stressed by Pesaran et al. (2001), the asymptotic distribution of the F-statistic for the Wald test is non-standard, given the mixture of variables that are integrated of order zero and one. However, Pesaran et al. (2001) provide the critical values of the lower and upper bounds. Thus, the null hypothesis of no

cointegration can be rejected if the calculated F-statistic is above the upper critical value; if it is below the lower critical value, the null hypothesis cannot be rejected. The result is inconclusive if the calculated F-statistic falls between the lower and upper critical values.

Diagnostic tests will be applied in the fourth step to assess the adequacy of the model. We employ the autocorrelation LM test, the Ramsey RESET test, the normality test and the heteroscedasticity test. Moreover, we will perform the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests to assess the possible existence of structural breaks in the sample.

Finally, long-term and short-term determinants of labour share and the robustness of results are analysed.

5. EMPIRICAL RESULTS AND DISCUSSION

The empirical analysis starts with a study of unit roots. Plots of our nine variables (Figure A1 to Figure A9 in the Appendix) seem to indicate that while some of them are stationary in levels, others are non-stationary. Employing the ADF and PP tests (Table 1 and Table A3 in Appendix, respectively), we conclude that the variables labour share, technological progress, globalisation, business cycle and trade union are integrated of order zero. For the remaining four variables (education, financial activity, government activity and shareholder orientation), neither test can reject the null hypothesis of non-stationary at 5% significance level. We then performed the unit roots tests for the first differences of the latter four variables; and both tests reject the null hypothesis. These four variables are therefore integrated of order one. Hence, unit roots tests show that the variables are integrated of order zero or one, thus justifying the adoption of ARDL models.

Table 1 – *P-values* of the ADF unit root test

Variable	Level			First Difference		
	Intercept	***Trend and Intercept***	***None***	***Intercept***	***Trend and Intercept***	***None***
LS	0.032*	0.147	0.049	0.001	0.836	0.000*
TP	0.002	0.003*	0.006	0.000	0.000	0.000*
GL	0.068	0.049*	0.935	0.000	0.013	0.000*
ED	0.833	0.593*	0.861	0.151	0.385	0.070*
BC	0.182	0.999	0.020*	0.002	0.004*	0.001
FA	0.195*	0.408	0.641	0.000	0.000	0.000*
GA	0.276*	0.988	0.600	0.000*	0.001	0.000
SO	0.356*	0.884	0.738	0.005	0.000*	0.000
TU	0.001	0.020*	0.066	0.294	0.089*	0.037

Note: The lag lengths were selected automatically based on the AIC criteria and * indicates the exogenous variables included in the test according to the AIC criteria

As we have a set of eight independent variables for a relatively small sample, we start by estimating a model for labour share including only the four independent variables associated with financialisation (financial activity, government activity, shareholder orientation and trade unions), which we refer to as the short version of the model.

We first determine the optimal lag length using information criteria and considering an unrestricted VAR. A number of lags between zero and three was considered because the unrestricted VAR does not satisfy the stability condition with a higher number of lags - at least one characteristic polynomial root is outside the unit circle (Lütkepohl 1991)[5]. Information criteria do not agree on the optimal lag; some indicate an optimal lag of two and others one (Table 2). We choose two lags as this is the choice of the majority of information criteria and taking into account that FPE (as well as AIC) is a better choice than the other criteria in the case of small sample sizes (sixty observations and below) - Liew (2004). Hence, we run an ARDL on Microfit software (5.0 version) considering two as the maximum order. Then, the software automatically defines the optimal number of lags (up to the defined limit of two) for each variable.

Table 2 – Values of the information criteria by lag (short version)

Lag	LR	FPE	AIC	SC	HQ
0	n. a.	3.87e-16	-21.3	-21.1	-21.2
1	248.2	1.35e-19	-29.3	-27.9	-28.9
2	59.8*	4.22e-20*	-30.6	-28.0*	-29.7*
3	27.7	5.04e-20	-30.7*	-27.0	-29.6

Note: * indicates the optimal lag order selected by the respective criteria

We then apply the methodology developed by Pesaran et al. (2001), to assess whether there is a cointegration relationship between our five variables. No trend was considered because the labour share does not exhibit this characteristic. The computed F-statistic of 6.504 is higher than the upper bound critical value at 1% (4.781)[6], which means that the null hypothesis of no cointegration can be rejected: there is evidence supporting the existence of a cointegration relationship between these variables.

Next, we conduct four diagnostic tests to assess the adequacy of this model (Table 3). The model does not show evidence of autocorrelation (LM test) but, when using the Ramsey RESET test, we reject the null hypothesis of no misspecification, which suggests that the model may not be well specified in its functional form. This could be due to the omission of relevant variables (Studenmund 2005) as, here, we are estimating the labour share without the standards variables; these will be added later.

[5] Results available upon request.

[6] Critical value bounds of the F-statistic were obtained in Pesaran – Pesaran (2009), considering intercept and no trend and for a number of variables equal to five.

Residuals are normal and homoscedastic. Finally, plots of CUSUM and CUSUMSQ tests (Figure A10 and Figure A11 in the Appendix) show that the recursive residuals lie in between the straight lines at 5% significance levels, indicating that the coefficients are stable over the sample period and confirming the absence of structural breaks. In short, the estimated ARDL does not suffer from any serious econometric problem.

Table 3 – Diagnostic tests for ARDL estimations (short version)

Test	Chi-square	*P-value*	F-statistic	*P-value*
Autocorrelation	0.288	0.592	0.202	0.657
Ramsey's RESET	15.045	0.000	19.271	0.000
Normality	1.081	0.582	n. a.	n. a.
Heteroscedasticity	0.197	0.657	186	0.669

Note: We show two statistics for each test: the LM statistic (asymptotically distributed as a Chi-square) and the LM F or 'modified LM' statistic (F-statistic).

Analysing the long-term equation, it can be concluded that only shareholder orientation and trade unions are statistically significant (Table 4). Nonetheless, financial activity and government activity, which are statistically insignificant, have the expected negative and positive signs, respectively. This seems to partially confirm the financialisation literature's claim that a rise in financial activity decreases the labour share and that a rise in government activity increases it. On the other hand, both coefficients of the statistically significant variables have the signs foreseen in the literature. Shareholder orientation exerts a negative influence on labour share; a 1 p.p. rise in financial payments of non-financial corporations lowers the labour share by around 0.258 p.p.. In turn, trade union density is a positive determinant of the labour share: a 1 p.p. rise in this variable increases the labour income share by about 0.417 p. p.

Table 4 – The long-term estimations of labour income share (short-version)

Variable	Coefficient	*Standard Error*	T-statistic
FA_t	-1.110	1.000	-1.109
GA_t	0.470	0.284	1.652
SO_t	-0.258*	0.138	-1.863
TU_t	0.339**	0.160	2.123
β_0	0.417**	0.168	2.482

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

In the short-term (Table 5), the coefficient of the error correction term is negative and it is significant at 1% significance level, confirming that the model is stable and converges to the long-term equilibrium. All variables are statistically significant in the short-term except for the lag of labour share and financial activity. Once again, financial activity has the expected negative sign, and government activity and trade unions continue to exert a positive influence on labour share. The only unexpected result is for the shareholder orientation variable, which has a positive influence on labour share in the short-term. This may be due to the fact that higher payout ratios can be the result of a better economic and financial situation of non-

financial companies, which may in turn lead to an increase in wages in the short-term. In addition, it might also be explained by the fact that some companies attribute bonuses to workers based on their annual profits, and therefore high profits are associated with both high dividends and bonuses (included in wages).

Table 5 – The short-term estimations of labour income share (short-version)

Variable	Coefficient	*Standard Error*	T-statistic
ΔLS_{t-1}	0.173	0.130	1.328
ΔFA_t	-0.399	0.387	-1.032
ΔGA_t	0.637***	0.139	4.587
ΔSO_t	0.125**	0.058	2.138
ΔTU_t	0.122*	0.069	1.760
EC_{t-1}	-0.360***	0.093	-3.863

Note: Δ is the operator of the first differences, *** indicates statistical significance at 1% level, ** indicates statistical significance at 5% level and * indicates statistical significance at 10% level

Our next step is to re-estimate the labour share equation including not only the four variables related with the financialisation process, but also others linked to functional income distribution, namely technological progress, globalisation, education and business cycle. This should increase the consistency of our model by mitigating the problem of omitted variables. Although there is a risk that including irrelevant variables would decrease efficiency, it is a small one as care was taken to select variables related with the labour share. Finally, inconsistency is more problematic than inefficiency (Brooks 2009), hence the decision to include all eight independent variables.

In this context, we start by assessing the lag length according to the different information criteria and considering an unrestricted VAR. Here, only lags between zero and two were considered because our sample size and the inclusion of eight independent variables does not allow the use of a higher number of lags. The criteria LR, FPE and AIC indicate two has the optimal lag, whereas SC and HQ indicate one lag. We choose two lags as a maximum order to run our ARDL as this is the conclusion drawn from the majority of the information criteria, including FPE and AIC that are the best choices for small samples.

There continues to be evidence of a cointegration relationship, insofar as the computed F-statistic of 4.892 remains higher than the critical value of the upper bound (3.989 at 1%)[7].

The diagnostic tests in Table 5 show that we cannot reject the null hypothesis of no serial correlation, of normality or homoscedasticity; on the other hand, the plots of CUSUM and CUSUMSQ continue to suggest that our coefficients are stable and confirm the absence of significant structural breaks[8]. The most important change in results is for the Ramsey RESET test as we can no longer reject the null hypothesis of no misspecification by the LM F statistic;

[7] Critical value bounds of the F-statistic were obtained in Pesaran – Pesaran (2009), considering intercept and no trend and for a number of variables equal to nine.

[8] Results available upon request.

however, we continue to reject the null hypothesis by the LM statistic. Kiviet (1986) notes that in small samples the LM F is generally preferable to the LM version and so we can assume that this model is well specified in its functional form, suggesting as expected that the long version is more appropriate to describe the labour share.

Table 6 – Diagnostic tests for ARDL estimations (long version)

Test	Chi-square	*P-value*	F-statistic	*P-value*
Autocorrelation	1.887	0.170	0.607	0.454
Ramsey's RESET	7.477	0.006	2.930	0.118
Normality	1.566	0.457	n. a.	n. a.
Heteroscedasticity	1.058	0.304	1.027	0.319

In the long-term (Table 7), all variables are statistically significant except for technological progress, financial activity and shareholder orientation. The variable of shareholder orientation lost its statistical and economic significance but maintains the expected negative sign. Here, the statistical insignificance of the shareholder orientation could be explained by the fact that there has been no clear upward trend in financial payments by non-financial firms in Portugal as demonstrated by Figure A8 in the Appendix. Moreover, Barradas (2015) shows that financial payments of Portuguese non-financial firms are below the European average. This is probably due to Portugal's "bank-based" financial system, which may mean non-financial firms feel less pressure to increase their payments to financial markets in the form of interest, dividends and stock buybacks. Banks tend to establish long-term relationships with clients and have a medium and long-term vision of clients' businesses, which entails less pressure on firms to pay interest.

On the other hand, all coefficients of the statistically significant variables have the expected signs. The business cycle has a positive influence on the labour share in the long-term according to the hypothesis of Estrada – Valdeolivas (2012).

As expected, globalisation exerts a negative impact on the labour share, confirming the Hecksher-Ohlin model and the Stolper-Samuelson theorem. Education level is a positive determinant for the labour share. Government activity became statistically significant and with a positive sign, in line with the literature on financialisation. A 1 p.p. rise in total public expenditure increases the labour income share by around 0.598 p.p. Finally and as expected, trade union density remains statistically significant, and is a positive determinant of the labour share in the long-term: a 1 p.p. increase in trade unions raises the labour income share by about 0.722 p.p.

Table 7 – The long-term estimations of labour income share (long version)

Variable	Coefficient	*Standard Error*	T-statistic
TP_t	0.161	0.214	0.754
GL_t	-0.304***	0.047	-6.499
ED_t	0.224***	0.032	6.948

BC_t	0.665***	0.133	4.997
FA_t	0.589	0.484	1.219
GA_t	0.598***	0.191	3.128
SO_t	-0.007	0.042	-0.174
TU_t	0.722***	0.065	11.135
β_0	0.190**	0.083	2.284

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

The error correction term continues to have a statistically significant negative coefficient (Table 8). As expected, globalisation still has a negative influence on the labour share in the short-term, while trade union density exerts a positive effect. Surprisingly, financial activity and shareholder orientation are positively related with the labour share in the short-term. In the case of the financial activity, this could be associated with the fact that the Portuguese financial sector traditionally has higher wages than other sectors. On the other hand, the coefficient of shareholder orientation has the same sign as in the short version of the model, and the same explanations for its impact are also applicable here. Government activity has a positive contemporaneous effect on labour share but it has a negative effect in the first lag. We therefore performed a Wald Test to determine whether the sum of the two effects is zero; we cannot reject the null hypothesis (Chi-square = 0.172, p-value = 0.678), and conclude that the net short-run effect of government activity in the labour share is null. The remaining variables (technological progress, education and business cycle) are not statistically significant.

Table 8 – The short-term estimations of labour income share (long version)

Variable	Coefficient	*Standard Error*	T-statistic
ΔTP_t	0.263	0.357	0.736
ΔGL_t	-0.347***	0.091	-3.800
ΔGL_{t-1}	-0.074	0.083	-0.889
ΔED_t	0.147	0.091	1.623
ΔBC_t	0.378	0.443	0.852
ΔBC_{t-1}	-0.277	0.179	-1.550
ΔFA_t	1.908***	0.606	3.150
ΔFA_{t-1}	1.200	0.743	1.615
ΔGA_t	0.651**	0.266	2.450
ΔGA_{t-1}	-0.560*	0.284	-1.973
ΔSO_t	0.173*	0.087	1.994
ΔSO_{t-1}	0.137*	0.075	1.836
ΔTU_t	0.546**	0.257	2.123
EC_{t-1}	-1.630***	0.271	-6.007

Note: Δ is the operator of the first differences, *** indicates statistical significance at 1% level, ** indicates statistical significance at 5% level and * indicates statistical significance at 1% level

It should also be noted that the results of the long version do not change greatly if we extend our measurement of the weight of financial activity to include both financial and real estate industries. [9] There is still a cointegration relationship between the variables and the model converges to the long-term equilibrium. The most important change is that technological progress is a statistically significant variable in the long-term and has the expected negative

[9] This as well as the results of the sensitivity analyses below are available upon request.

sign. On the other hand, financial activity is statistically significant in the long-term but, in contradiction with the literature, has a positive sign.

Similarly, the results are also quite similar if we choose the variable of net financial payments of non-financial enterprises (i.e. the difference between financial payments and financial receipts) instead of just financial payments. The existence of cointegration was confirmed and the model converges to the long-term. Once again, the most important change is that the technological progress variable is statistically significant in the long-term with the expected negative sign.

Additionally and since the indebtedness of non-financial firms is a distinctive feature of the financialisation process in Portugal (Lagoa et al. 2014), we re-estimated the long version of the model replacing financial payments with a variable of non-financial firms' indebtedness[10]. Overall, the results do not change significantly. The variables are cointegrated and the variable of non-financial firms' indebtedness is positively related with the labour share in the long-term, suggesting that debt was used to improve the economic situation of firms in the long-term with a positive effect on wages.

IMF's intervention in 1978-79 entailed a significant decline in the labour share (Figure A1). However, we obtain similar results (especially for the long-term equation) if we re-estimate the long version of the model starting only in 1980.

Finally, we re-estimated the long version of the model including a dummy variable for the years 2009 to 2012 and excluding the statistically insignificant variable of technological progress. These years correspond to a period of deep economic crisis in the Portuguese economy, visible in the negative output gap (Figure A5 in the Appendix). The first two years coincided with the Subprime crisis and the last two with the Portuguese sovereign debt crisis. Results are quite similar, except for the financial activity variable which becomes statistically significant with a positive coefficient both in the short- and long-term. The most important finding is that the dummy variable is statistically significant and with a negative coefficient; this proves that, during the crises, there were other factors not controlled in the model that contributed to a decline in the labour share.

All the above analyses indicate that our results are robust to other specifications. In general, the robustness analysis seems to point to a negative effect of technological progress in the labour share in Portugal. In conclusion, we find evidence supporting the claim that financialisation influenced the labour share in Portugal, mainly due to the government activity and unionisation channels. Moreover, the traditional explanations of globalisation, technological progress, the level of education and business cycle also seem to be important determinants of the wage share.

[10] This variable is the banking credit to non-financial firms over GDP from Bank of Portugal.

6. CONCLUSION

The financialisation literature indicates three different ways in which the growth of finance contributed to the observed decline in labour share worldwide: the change in the sectorial composition of the economy, the emergence of the "shareholder value orientation" paradigm, and the weakening of trade union power.

This paper makes an empirical analysis of the relationship between financialisation and functional income distribution in Portugal between 1978 and 2012. We estimated an equation for labour share using aggregate annual data and make use of both standard variables (technological progress, globalisation, education and business cycle) and four additional measures to reflect the different channels of financialisation (financial activity, government activity, shareholder orientation and trade union density).

Since the variables are integrated of order zero and one, we use the ARDL bounds testing approach and determine the existence of cointegration between variables. The model distinguishes between long-term and short-term effects on the labour share. In the long-term, only the channels related with government activity and trade unions have a positive and statistically significance effect on the labour share. In the short-term, trade union density is positively related with the labour share, whereas financial activity and shareholder orientation have a positive influence on the labour share in contrast with what is foreseen in the literature.

However, the labour share is also affected by the usual variables, particularly in the long-term, namely globalisation, education and business cycle. Output gap and education level have a positive effect, but the globalisation process exerts a negative influence. The sensitivity analysis shows also that technological progress has been capital augmenting in Portugal, thus having a negative influence on the wage share.

Our findings demonstrate the indirect negative effects of financialisation on the labour share, but we are unable to find direct effects. Nevertheless, this shows that financialisation not only affects the functional income distribution of economies like the USA and the UK, but also of a much smaller, less developed, less financialised and more peripheral economy like Portugal.

This is an important lesson for policy makers, particularly in more peripheral European countries, including those of Central and Eastern Europe (CEE). It adds to the existing evidence that financialisation occurs in non-core countries (notably in Latin America and in CEE; Becker et al. 2010) and that it is an important determinant of the downward trend in labour share observed in most countries (Stockhammer, 2009 and 2012; Kristal, 2010; Peralta – Escalonilla, 2011; Dünhaupt, 2011; Estrada – Valdeolivas, 2012; and Lin – Tomaskovic-Devey,2013). Our paper highlights the fact that financialisation impacts functional income distribution especially through the indirect channels of government expenditure and trade union activity. The CEE

countries are particularly vulnerable in these two indicators as they already have lower levels of public spending and trade union density than Europe's core countries (EU15). Therefore, the impact of future increases in financialisation on the labour income share should be a relevant concern, despite the low level of financial payments by non-financial corporations in CEE countries (Barradas, 2015).

Stockhammer (2009), Dünhaupt (2013b) and the International Labour Organisation (2011) warn that policy measures are required to stabilise the labour share and they provide a set of suggestions for that purpose. According to our results, in order to contain the fall in the labour share, policy makers should control the downsizing of government activity, foster higher levels of education in the workforce (see also IMF, 2007), and avoid a decline in the bargaining power of trade unions. Efforts should also be made to improve trade specialisation in order to better position the economy in the globalised market.

The negative impact of the public sector cuts on the labour share need to be mitigated. Firstly, areas in which public provision is beneficial or the advantages of private provision are questionable should be kept within the public sphere, despite the pressure to broaden the influence of private interests. When assessing the advantages of reducing public intervention in the economy, it is important to take into account the social dimension as well as the economic and financial dimensions. Regulations must prevent firms, notably privatised ones, from exploiting market power to make profits above the fair level.

It is relevant to reassess the advantages of the deregulation of labour markets, notably the reduction in unemployment benefits, employment protection, and minimum wage. When it is necessary to foster employment, deregulation should be used with care to avoid a further decline in wages and in trade union influence. In the context of the flexicurity principles advocated by the EC (2007: Chapter 5) to address technological progress and globalisation, active labour market policies are necessary to offset the reduction in employment protection.

Continuous and effective social dialogue between firms' management and trade unions must be fostered so that they can work together to resolve problems and address challenges. In addition, if trade union representatives were given a seat on corporation boards, as in some key German firms, it would avoid a detrimental focus on shareholder value (Stockhammer, 2009). In the context of social dialogue, trade unions and employers must strive to bring real wages increase in line with labour productivity growth.

Since financialisation weakens the power of trade unions and leads to cuts in the public sector, some additional measures could be taken to reduce the shareholder value orientation of corporations. Monetary incentives for managers need to be linked to medium/long-term profits, and there should be fiscal incentives for productive investment and disincentives for financial investments by non-financial corporations; moreover, excessive dividend pay-out ratios and

stock buyback should be taxed at a higher rate. In general terms, the stronger regulation of financial institutions can have a positive effect on the wage share.

Finally, the labour intensive sectors that are more exposed to international competition based on low costs, should receive government support to upgrade their competitive position by creating more value added per unit through differentiation or niche strategies.

Despite possible data difficulties, it would be interesting in future research to analyse the effect of financialisation on labour share using firm-level or industry-level data, in order to assess whether the effects depend on the industry or firm size, as in Lin – Tomaskovic-Devey (2013) and Alvarez (2015).

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8. APPENDIX

Table A1 – The descriptive statistics of the data

	LS	***TP***	***GL***	***ED***	***BC***	***FA***	***GA***	***SO***	***TU***
Observations	35	35	35	35	35	35	35	35	35
Mean	0.598	0.012	0.638	0.424	-0.001	0.063	0.410	0.245	0.312
Median	0.587	0.009	0.644	0.515	-0.002	0.062	0.416	0.231	0.255
Maximum	0.746	0.057	0.780	0.725	0.050	0.078	0.515	0.465	0.608
Minimum	0.542	-0.017	0.433	0.089	-0,050	0.049	0.308	0.154	0.194
Standard Deviation	0.004	0.019	0.068	0.220	0.027	0.007	0.052	0.081	0.130
Skewness	1.750	0.576	-0.437	-0.273	-0.029	0.388	-0.117	1.187	1.034
Kurtosis	5.693	2.511	4.140	1.460	2.463	2.627	2.369	3.839	2.649

Table A2 – The correlation matrix between variables

	LS	***TP***	***GL***	***ED***	***BC***	***FA***	***GA***	***SO***	***TU***
LS	1								
TP	0.18	1							
GL	-0.74***	-0.33*	1						
ED	-0.44***	-0.47***	0.60***	1					
BC	-0.15	0.05	0.10	0.17	1				
FA	-0.39**	-0.10	0.54***	0.13	0.07	1			
GA	-0.51***	-0.48***	0.60***	0.91***	0.03	0.33*	1		
SO	0.23	-0.19	-0.04	-0.51***	-0.50***	0.21	-0.33**	1	
TU	0.69***	0.42**	-0.67***	-0.92***	-0.33*	-0.32*	-0.89***	0.53***	1

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

Table A3 – *P-values* of the PP unit root test

Variable	**Level**			**First Difference**		
	Intercept	***Trend and Intercept***	***None***	***Intercept***	***Trend and Intercept***	***None***
LS	0.001*	0.027	0.049	0.001	0.004	0.000*
TP	0.002	0.004*	0.000	0.000	0.000	0.000*
GL	0.069	0.051*	0.969	0.000	0.000	0.000*
ED	0.826*	0.814	0.989	0.000*	0.002	0.000
BC	0.169	0.604	0.020*	0.003	0.014	0.000*
FA	0.185*	0.354	0.681	0.000	0.000	0.000*
GA	0.588	0.990*	0.666	0.074	0.144	0.006*
SO	0.352*	0.595	0.558	0.008	0.037	0.000*
TU	0.001*	0.940	0.000	0.002	0.000*	0.004

Note: * indicates the exogenous variables included in the test according to the AIC criteria

Figure A1 – Labour income share (% of gross domestic product)

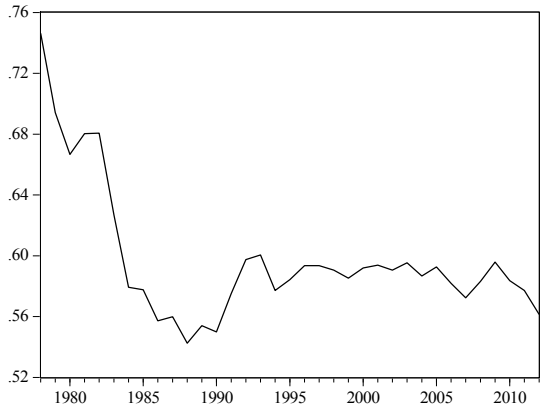


Figure A2 – Technological progress (annual growth rate)

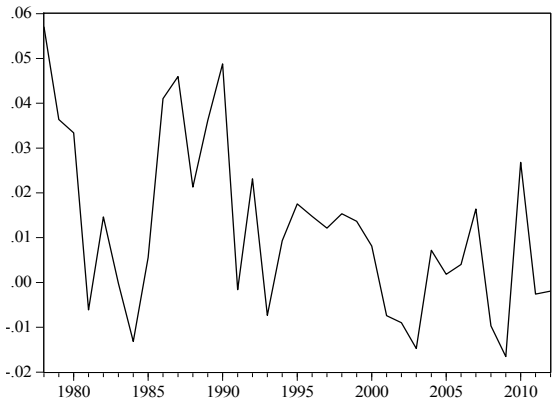


Figure A3 – Globalisation (% of gross domestic product)

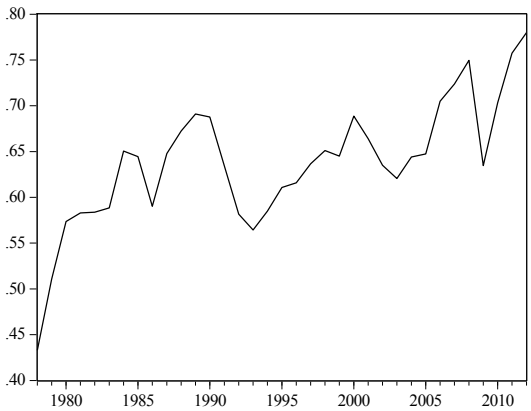


Figure A4 – Education of the labour force (%)

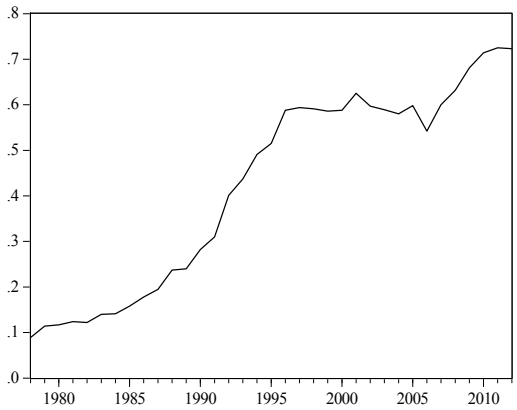


Figure A5 – Business cycle (%)

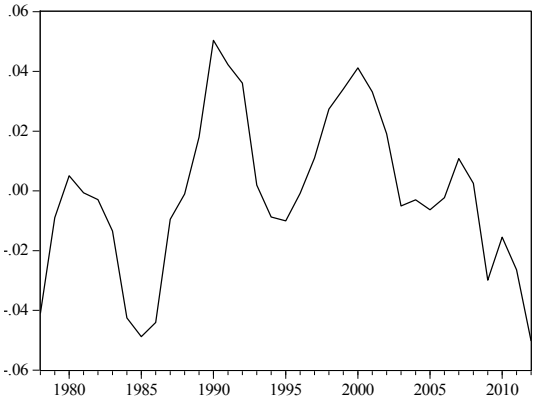


Figure A6 – Financial activity (% of gross value added of total economy)

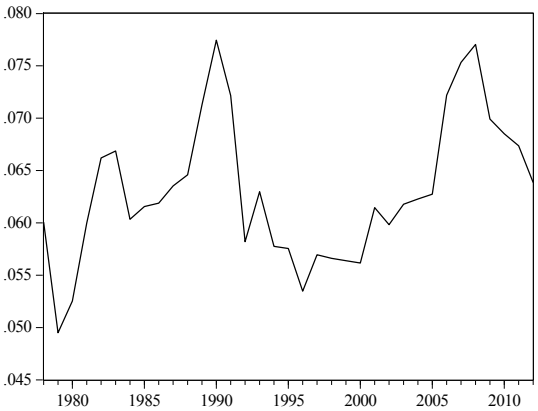


Figure A7 – Government activity (% of gross domestic product)

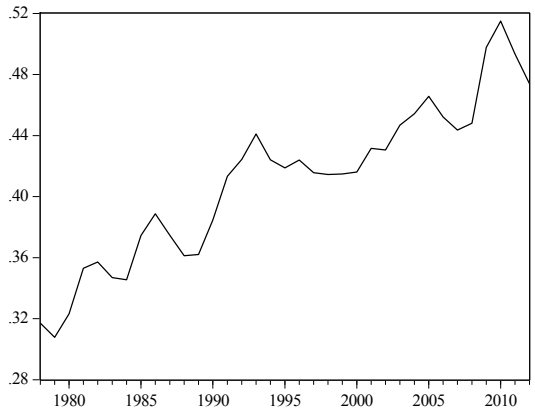


Figure A8 – Shareholder orientation (% of gross value added of non-financial firms)

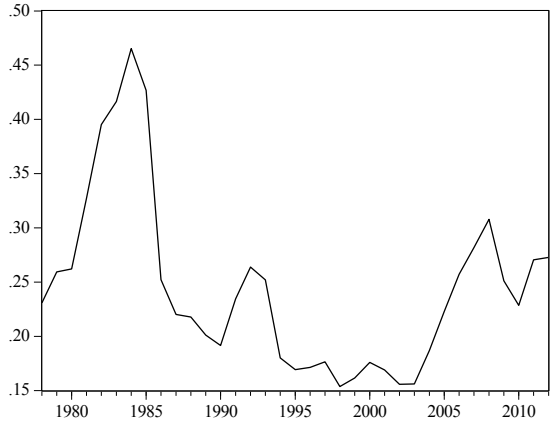


Figure A9 –Trade union density (%)

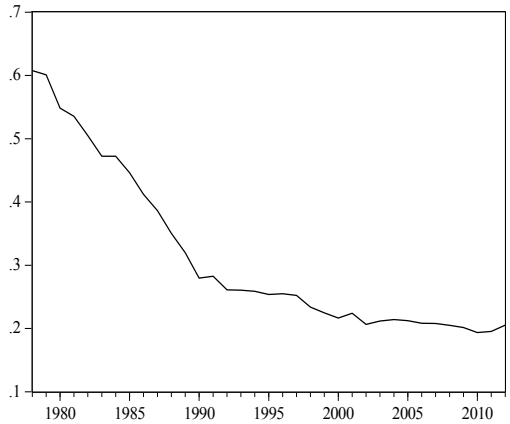
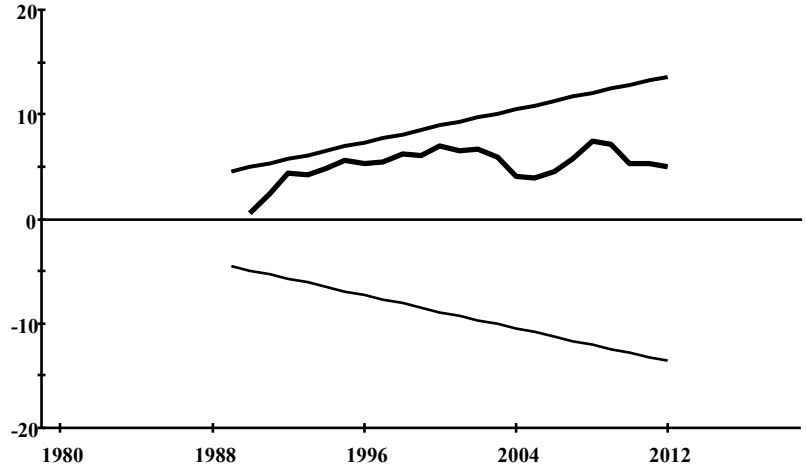
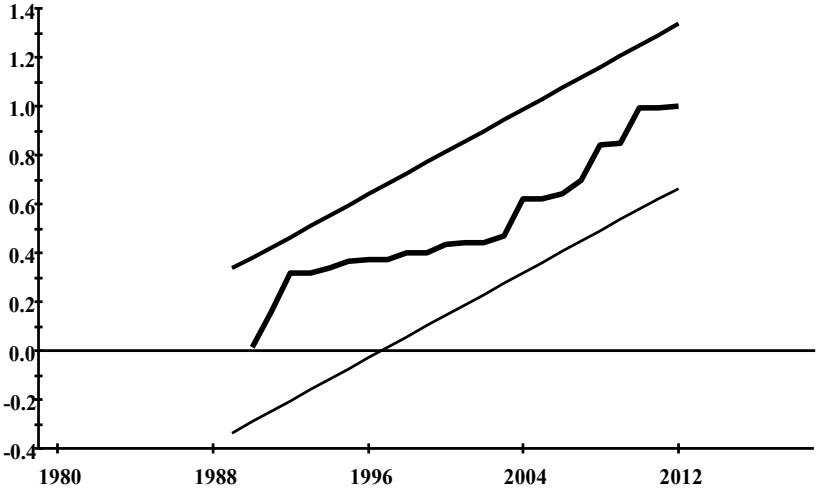


Figure A10 – The plot of cumulative sum of recursive residuals



Note: The straight lines represent critical bounds at 5% significance level

Figure A11 – The plot of cumulative sum of squares of recursive residuals



Note: The straight lines represent critical bounds at 5% significance level

Figure 1 – The effects of financialisation on inequality of functional income distribution (decrease in labour income share)

Inequality of income distribution	**Change in sectorial composition**	Increasing importance of finance Downsizing of government activity
	"Shareholder value orientation"	Rise in top management salaries Rise in the profit claims of rentiers
	Weakening of trade unions	"Shareholder value orientation" Increasing importance of finance Downsizing activity of public sector Deregulation of labour markets Liberalisation and globalisation

Source: Authors' representation based on Hein (2012), Hein and Detzer (2014), Michell (2014), Hein and Dodig (2015), among others

Table 1 – *P-values* of the ADF unit root test

Variable	Level			First Difference		
	Intercept	***Trend and Intercept***	***None***	***Intercept***	***Trend and Intercept***	***None***
LS	0.032*	0.147	0.049	0.001	0.836	0.000*
TP	0.002	0.003*	0.006	0.000	0.000	0.000*
GL	0.068	0.049*	0.935	0.000	0.013	0.000*
ED	0.833	0.593*	0.861	0.151	0.385	0.070*
BC	0.182	0.999	0.020*	0.002	0.004*	0.001
FA	0.195*	0.408	0.641	0.000	0.000	0.000*
GA	0.276*	0.988	0.600	0.000*	0.001	0.000
SO	0.356*	0.884	0.738	0.005	0.000*	0.000
TU	0.001	0.020*	0.066	0.294	0.089*	0.037

Note: The lag lengths were selected automatically based on the AIC criteria and * indicates the exogenous variables included in the test according to the AIC criteria

Table 2 – Values of the information criteria by lag (short version)

Lag	LR	FPE	AIC	SC	HQ
0	n. a.	3.87e-16	-21.3	-21.1	-21.2
1	248.2	1.35e-19	-29.3	-27.9	-28.9
2	59.8*	4.22e-20*	-30.6	-28.0*	-29.7*
3	27.7	5.04e-20	-30.7*	-27.0	-29.6

Note: * indicates the optimal lag order selected by the respective criteria

Table 3 – Diagnostic tests for ARDL estimations (short version)

Test	Chi-square	*P-value*	F-statistic	*P-value*
Autocorrelation	0.288	0.592	0.202	0.657
Ramsey's RESET	15.045	0.000	19.271	0.000
Normality	1.081	0.582	n. a.	n. a.
Heteroscedasticity	0.197	0.657	186	0.669

Note: We show two statistics for each test: the LM statistic (asymptotically distributed as a Chi-square) and the LM F or 'modified LM' statistic (F-statistic).

Table 4 – The long-term estimations of labour income share (short-version)

Variable	Coefficient	*Standard Error*	T-statistic
FA_t	-1.110	1.000	-1.109
GA_t	0.470	0.284	1.652
SO_t	-0.258*	0.138	-1.863
TU_t	0.339**	0.160	2.123
β_0	0.417**	0.168	2.482

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

Table 5 – The short-term estimations of labour income share (short-version)

Variable	Coefficient	*Standard Error*	T-statistic
ΔLS_{t-1}	0.173	0.130	1.328
ΔFA_t	-0.399	0.387	-1.032
ΔGA_t	0.637***	0.139	4.587
ΔSO_t	0.125**	0.058	2.138
ΔTU_t	0.122*	0.069	1.760
EC_{t-1}	-0.360***	0.093	-3.863

Note: Δ is the operator of the first differences, *** indicates statistical significance at 1% level, ** indicates statistical significance at 5% level and * indicates statistical significance at 10% level

Table 6 – Diagnostic tests for ARDL estimations (long version)

Test	Chi-square	*P-value*	F-statistic	*P-value*
Autocorrelation	1.887	0.170	0.607	0.454
Ramsey's RESET	7.477	0.006	2.930	0.118
Normality	1.566	0.457	n. a.	n. a.
Heteroscedasticity	1.058	0.304	1.027	0.319

Table 7 – The long-term estimations of labour income share (long version)

Variable	Coefficient	*Standard Error*	T-statistic
TP_t	0.161	0.214	0.754
GL_t	-0.304***	0.047	-6.499
ED_t	0.224***	0.032	6.948
BC_t	0.665***	0.133	4.997
FA_t	0.589	0.484	1.219
GA_t	0.598***	0.191	3.128
SO_t	-0.007	0.042	-0.174
TU_t	0.722***	0.065	11.135
β_0	0.190**	0.083	2.284

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

Table 8 – The short-term estimations of labour income share (long version)

Variable	Coefficient	*Standard Error*	T-statistic
ΔTP_t	0.263	0.357	0.736
ΔGL_t	-0.347***	0.091	-3.800
ΔGL_{t-1}	-0.074	0.083	-0.889
ΔED_t	0.147	0.091	1.623
ΔBC_t	0.378	0.443	0.852
ΔBC_{t-1}	-0.277	0.179	-1.550
ΔFA_t	1.908***	0.606	3.150
ΔFA_{t-1}	1.200	0.743	1.615
ΔGA_t	0.651**	0.266	2.450
ΔGA_{t-1}	-0.560*	0.284	-1.973
ΔSO_t	0.173*	0.087	1.994
ΔSO_{t-1}	0.137*	0.075	1.836
ΔTU_t	0.546**	0.257	2.123
EC_{t-1}	-1.630***	0.271	-6.007

Note: Δ is the operator of the first differences, *** indicates statistical significance at 1% level, ** indicates statistical significance at 5% level and * indicates statistical significance at 1% level

Table A1 – The descriptive statistics of the data

	LS	*TP*	*GL*	*ED*	*BC*	*FA*	*GA*	*SO*	*TU*
Observations	35	35	35	35	35	35	35	35	35
Mean	0.598	0.012	0.638	0.424	-0.001	0.063	0.410	0.245	0.312
Median	0.587	0.009	0.644	0.515	-0.002	0.062	0.416	0.231	0.255
Maximum	0.746	0.057	0.780	0.725	0.050	0.078	0.515	0.465	0.608
Minimum	0.542	-0.017	0.433	0.089	-0,050	0.049	0.308	0.154	0.194
Standard Deviation	0.004	0.019	0.068	0.220	0.027	0.007	0.052	0.081	0.130
Skewness	1.750	0.576	-0.437	-0.273	-0.029	0.388	-0.117	1.187	1.034
Kurtosis	5.693	2.511	4.140	1.460	2.463	2.627	2.369	3.839	2.649

Table A2 – The correlation matrix between variables

	LS	***TP***	***GL***	***ED***	***BC***	***FA***	***GA***	***SO***	***TU***
LS	1								
TP	0.18	1							
GL	-0.74***	-0.33*	1						
ED	-0.44***	-0.47***	0.60***	1					
BC	-0.15	0.05	0.10	0.17	1				
FA	-0.39**	-0.10	0.54***	0.13	0.07	1			
GA	-0.51***	-0.48***	0.60***	0.91***	0.03	0.33*	1		
SO	0.23	-0.19	-0.04	-0.51***	-0.50***	0.21	-0.33**	1	
TU	0.69***	0.42**	-0.67***	-0.92***	-0.33*	-0.32*	-0.89***	0.53***	1

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

Table A3 – *P-values* of the PP unit root test

Variable	**Level**			**First Difference**		
	Intercept	***Trend and Intercept***	***None***	***Intercept***	***Trend and Intercept***	***None***
LS	0.001*	0.027	0.049	0.001	0.004	0.000*
TP	0.002	0.004*	0.000	0.000	0.000	0.000*
GL	0.069	0.051*	0.969	0.000	0.000	0.000*
ED	0.826*	0.814	0.989	0.000*	0.002	0.000
BC	0.169	0.604	0.020*	0.003	0.014	0.000*
FA	0.185*	0.354	0.681	0.000	0.000	0.000*
GA	0.588	0.990*	0.666	0.074	0.144	0.006*
SO	0.352*	0.595	0.558	0.008	0.037	0.000*
TU	0.001*	0.940	0.000	0.002	0.000*	0.004

Note: * indicates the exogenous variables included in the test according to the AIC criteria

Figure A1 – Labour income share (% of gross domestic product)

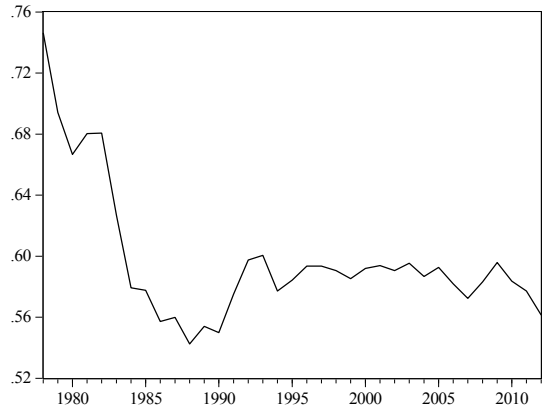


Figure A2 – Technological progress (annual growth rate)

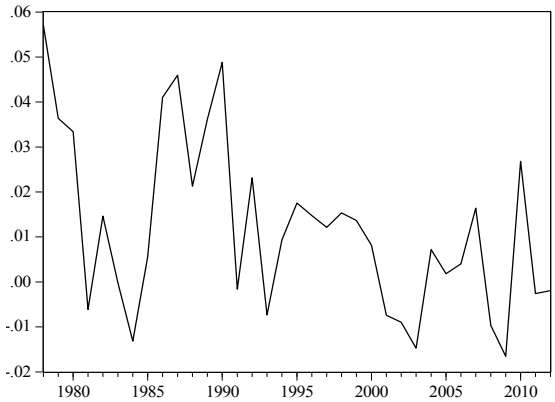


Figure A3 – Globalisation (% of gross domestic product)

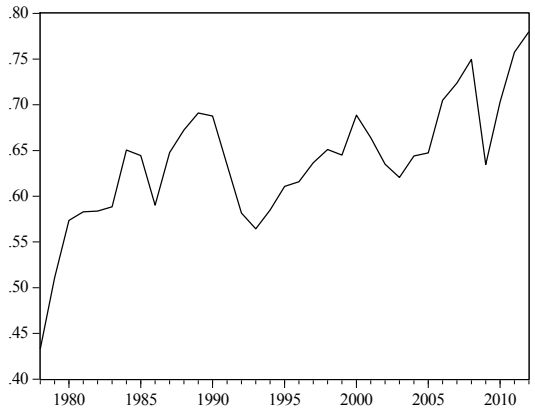


Figure A4 – Education of the labour force (%)

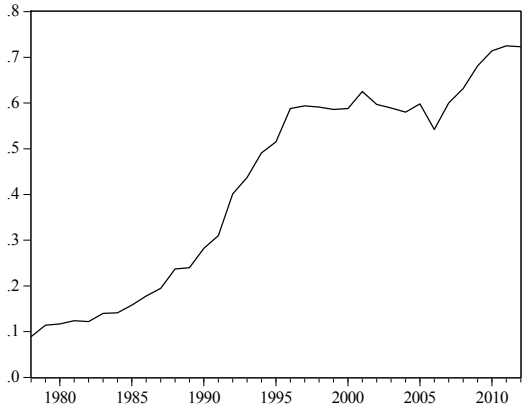


Figure A5 – Business cycle (%)

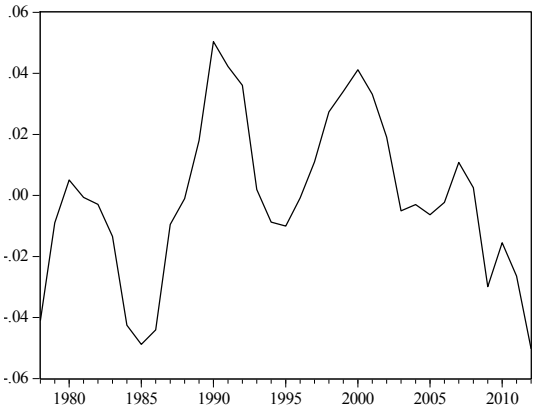


Figure A6 – Financial activity (% of gross value added of total economy)

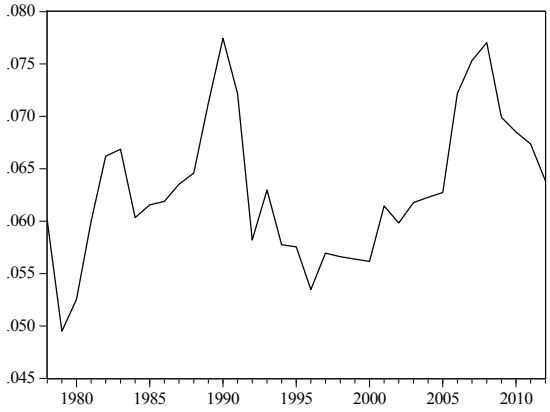


Figure A7 – Government activity (% of gross domestic product)

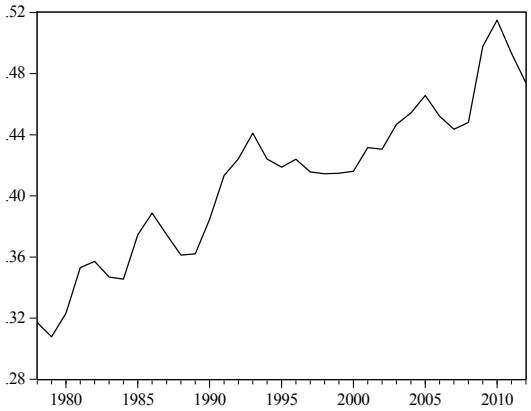


Figure A8 – Shareholder orientation (% of gross value added of non-financial firms)

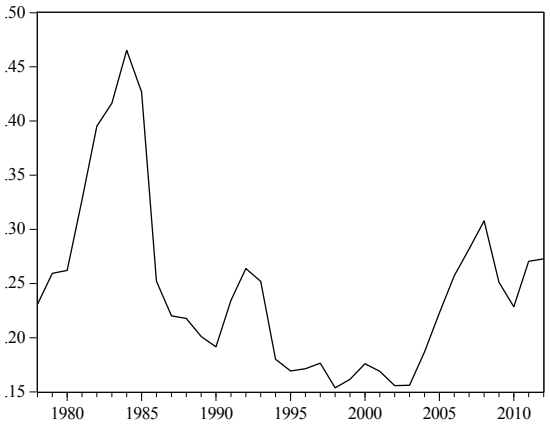


Figure A9 –Trade union density (%)

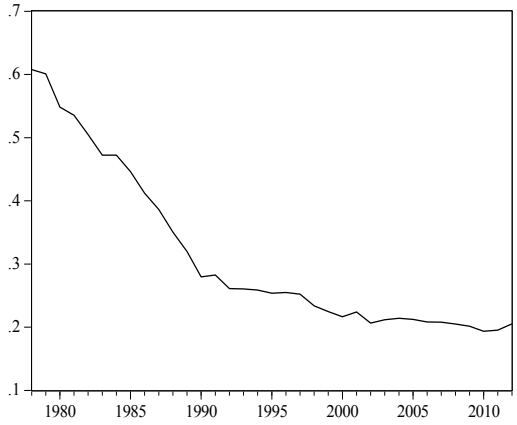
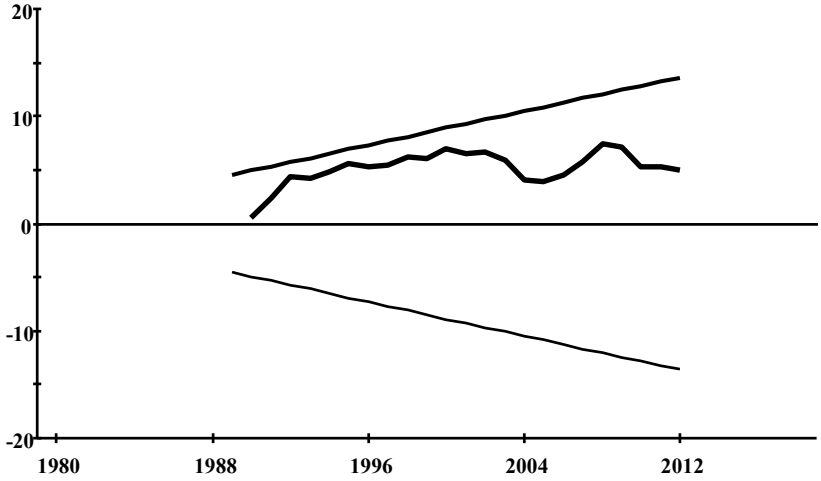
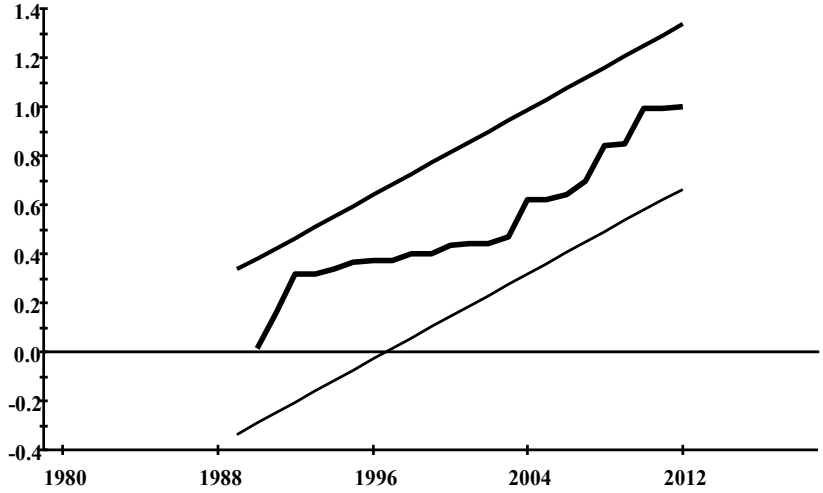


Figure A10 – The plot of cumulative sum of recursive residuals



Note: The straight lines represent critical bounds at 5% significance level

Figure A11 – The plot of cumulative sum of squares of recursive residuals



Note: The straight lines represent critical bounds at 5% significance level