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Functional income distribution in a small European country: The role of financialisation and other determinants[1]

ABSTRACT

This paper makes an empirical analysis of the relationship between financialisation and the evolution of labour income share in Portugal from 1978 to 2012. We estimate an equation for the labour income 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 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 there is a long-term relationship between all variables and that the financialisation process indirectly affects the labour income 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.

JEL CLASSIFICATION

C22, D33, E25 and E44

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1. INTRODUCTION

Conventional economic theory argues that factors' shares (labour income and profit shares) are constant in the long-term (Keynes, 1939; Solow, 1958; and Kaldor, 1961). However, profit share has increased in the major advanced economies since the early 1980s, with the corresponding fall in the labour income share (Stockhammer, 2009 and 2012; Kristal, 2010; Peralta and Escalonilla, 2011; Hein, 2013; Dünhaupt, 2011b; Estrada and Valdeolivas, 2012; Lin and Tomaskovic-Devey, 2013; and Michell, 2014). The fall in the labour income share may lead to the rise in inequality of personal incomes (Karanassou and Sala, 2013), exacerbate the emergence of social strains (Dünhaupt, 2011b), and trigger a reduction in aggregate demand in the medium and long-term (Naastepaad and Storm, 2007; Hein and Vogel, 2008; Stockhammer, 2012; and Dünhaupt, 2013a).

The financial sector has acquired great importance in most developed economies and a growing preponderance over the economy, a phenomenon to which some refer as financialisation (e.g. Krippner, 2005; Epstein, 2005). Hein (2012), Hein and Detzer (2014), Michell (2014), Hein and Dodig (2015) stress that financialisation decreases labour income share income through three channels: the change in the sectorial composition of the economy, 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 income 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 income share and thus a rise in profit share (e.g. Stockhammer, 2009; Kristal, 2010; Peralta and Escalonilla, 2011; Dünhaupt, 2013a; Karanassou and Sala, 2013; Lin and Tomaskovic-Devey, 2013; and Alvarez, 2015).

This paper aims to evaluate the impact of financialisation on functional income distribution in Portugal between 1978 and 2012. It should be noted that, in this paper we refer to the unequal distribution of income among different agents in a society according with the property of production factors (Czaplicki and Wieprzowski, 2013), and so inequality increases when the labour share decreases and profit share increases.

As illustrated by Figure A1 in the Appendix, Portugal is not an exception to the global trend of decline in the labour income share. Despite this overall trend, there are several periods in which the labour income share increased. From the early 1970s to 1976, there was a marked increase in the labour income share in Portugal due mainly to a revolutionary period that resulted in democratisation after a five-decade dictatorship (Lagoa *et al.*, 2014). Radical left-wing oriented economic policies associated with strong pressure from society for an

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improvement in real wages over this period led to a substantial rise of real wages. In the post-revolutionary period until the end of the 1980s, labour income share declined considerably as a result of international economic crises and the two adjustment programmes conducted by the IMF in Portugal during that period. The labour income share increased between 1988 and 1993, reflecting the strong economic dynamism in the country. Since the mid-1990s, it has remained relatively stable, despite a slight decline after 2009 due to the increase in unemployment and the fiscal adjustment measures implemented from 2011. Our goal is to analyse whether financialisation played a role in the evolution of the labour income share just described.

The paper contributes to the literature in two ways. First, whereas most studies address large, developed and highly financialised economies, this paper focuses on Portugal which has a less financialised 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 on this matter which conduct a panel data econometric analysis. This allows 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 finance sector enjoyed considerable growth after the 1980s, and there was a sovereign debt crisis in 2011. Financialisation in Portugal is not so developed 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 in the shareholders' general meeting and the management board cannot be ignored.

We estimate an equation for the labour income share, including standard variables (technological progress, globalisation, education and business cycle) and four proxies to capture the financialisation channels (financial activity, government activity, financial payments of non-financial companies and trade union density). We estimate an aggregate labour income share function given our interest in studying the aggregate evolution of functional income distribution.

Results indicate that the financialisation process conditioned the evolution of the labour income 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 relevance for the traditional explanations of the evolution of the labour income 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 income share model. In Section 4, we

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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 and Wieprzowski, 2013).

Nevertheless, some authors claim that financialisation leads to an increase in functional income distribution inequality. According to the Kaleckian perspective[2], as theoretically discussed by Hein (2012), Hein and Detzer (2014), Michell (2014), Hein and Dodig (2015), among others – Figure 1, this is explained by three different channels (and various sub-channels).

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

[2] Stockhammer (2009) notes that there are various explanations of income distribution according to different schools of thought. 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.

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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 non-financial sector in terms of value added and the decreasing weight of government activity.

On one hand, Hein (2012) recognises that the increased importance of the financial sector raises economy-wide gross profit share because its wage share is smaller than in the non-financial sector. In this regard, Kus (2012) adds that the expansion of finance meant a decline in the profitability of the non-financial sector, which in turn implied a contraction of middle-class and blue-collar wages in the non-financial 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 the reduction in the economy-wide labour income 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 income share because public firms have a smaller profit share than private firms. The reduction of government activity (either directly or through public firms) is in part explained by the financialisation logic, which aims to enlarge 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") that stresses the alignment of shareholders' and top managers' interests, the maximisation of shareholder value, low reinvestment in enterprises, and a focus on short-term profits to be distributed to shareholders. This corporate orientation encourages a cut in labour costs (Crotty, 1990; Aglietta, 2000; Lazonick and O'Sullivan, 2000; Stockhammer, 2010; Dünhaupt, 2011b; Hein, 2012; Kus, 2012; van der Zwan, 2014; Hein and Dodig, 2015). The reduction in wages is also related with the "neoliberal paradox", according to which shareholders force firms to remain competitive and profitable even in downturn environments (Crotty, 2005).

Note that Hein (2012) and Hein and Detzer (2014) conclude that the rise in top management salaries has mitigated the fall in the labour income share as these salaries are part of employees compensations in the national accounts and are therefore included in the labour income share. These authors also referred that the labour income share excluding the top management salaries has fallen even more than total labour income share.

Finally, the third channel is associated with the weakening of the trade unions and, therefore, the lower bargaining power of workers. The argument is that a higher (lower)

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bargaining power of workers leads to an increase (decrease) in wages (Stockhammer, 2009). Hein (2012) notes five specific sub-channels responsible for this.

First, the "shareholder value orientation" makes firms seek profits in financial (interest, dividends and capital gains) rather than productive activities (Orhangazi, 2008a and 2008b; Hein, 2012; Hein and van Treeck, 2010; Hein and Dodig, 2015; among others), which has an adverse impact on employment and so weakens trade unions; on the other hand, 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 also impaired trade unions 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 (e.g. cuts in social spending) that restrain the government's ability to mitigate inequalities (Kus, 2012). It may also depress the 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 focused on reducing the level and duration of unemployment benefits, decreasing employment protection, and decentralising wage bargaining (Stockhammer, 2004).

Fifth, workers' bargaining power was hampered by liberalisation and globalisation due to the "threat" from corporations to use outsourcing and relocate 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).

We consider the downsizing of government activity and trade unions to be indirect channels through which financialisation affects labour income 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 reduce the labour income share. In contrast, the channel of the change in sectorial composition linked to the increasing importance of financial activity and the shareholder orientation channel offer a direct link between financialisation and functional income distribution, because they involve the link between financial related variables and labour income share.

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Other explanations of functional income distribution focus on the role of technological progress (Stockhammer, 2009; Estrada and Valdeolivas, 2012; Guerriero and Sen, 2012; Dünhaupt, 2013a; Lin and 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 and Escalonilla (2011), Dünhaupt (2011b and 2013a) and Alvarez (2015). Nevertheless, a relatively small body of empirical literature has emerged in recent years estimating labour income 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 has led to a decline in the labour income share.

Judzik and Sala (2013) and Karanassou and Sala (2013) are the only papers not using panel data analysis. The former estimates the long-term effects of productivity growth, international trade and deunionisation on wages from 1980 to 2010 in Finland, France, Italy, Japan, Spain, Sweden, the UK and the USA, concluding that the decline in unionisation and growing exposure to international trade was responsible for the downward trend in wages and the labour income share. Karanassou and Sala (2013) estimate a labour income share equation for the USA using time series from 1960 to 2009, finding that the labour income share was positively affected by the capital intensity and negatively by the degree of openness. However, these authors do not directly study the impact of financialisation on functional income distribution.

All other works resort to panel data analysis, either at the country or firm level. Stockhammer (2009) estimates a wage share equation for fifteen countries between 1982 and 2003, finding that the degree of openness, wage pacts, real interest rates and financial globalisation have a negative effect on the wage share, whilst the impact of union density is positive. Kristal (2010) confirms the negative effect of financialisation in the labour income share, using a panel data composed of sixteen industrialised countries from 1961 to 2005. More specifically, she is able to identify that the decline in the labour income share since the 1980s can be explained by the reduction in unionisation rates and levels of strike activity, stagnation in government non-military spending, and increase in decentralised bargaining (note that these trends are in part consequence of financialisation). Peralta and Escalonilla (2011) conclude that the financialisation rate (measured by the difference between gross operating surplus and gross fixed capital formation as a percentage of gross domestic product) had a negative effect on the growth in real wages in the EU-15 economies between 1960 and 2010. Dünhaupt (2013a) estimates a wage share equation for thirteen OECD countries between 1996 and 2007,

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concluding that there is a relationship between the decline in the wage share and the increasing dividends and interest payments of non-financial firms, the process of globalisation and the decrease in the bargaining power of workers.

The paper by Lin and Tomaskovic-Devey (2013) is among those using firm-level data, and it studies the relationship between financialisation and rising income inequality in US non-financial industries from 1970 to 2008. They are able to identify that increased financial incomes was associated with a reduction in the labour income share. They also find that de-unionisation, technological change and globalisation led to a decline in the labour income share at the firm level. More recently, Alvarez (2015) conducted a panel data analysis for French non-financial firms between 2004 and 2013. He concludes that the financialisation process (measured by financial revenues minus financial expenses) has been responsible for a decline in the labour income share of non-financial companies. He also stresses that financialisation and technological change have the greatest influence on the labour income share, whereas globalisation and labour market institutions do not appear to have a strong influence.

The literature has focused mainly on large and highly developed economies and used panel data econometric analysis. Nevertheless, as this type of econometric analysis estimates an average effect for a set of countries, it does not account for the historical, social and economic circumstances responsible for the evolution of the labour income share in each country (Kristal, 2010; Dünhaupt, 2013a; and Judzik and Sala, 2013). Hence, in what follows, we use time series to make an empirical analysis of the role of financialisation in the functional income distribution in a smaller, less developed and more peripheral economy: the Portuguese economy.

Portugal's financialisation process has specific characteristics, and not all variables evolved according with what is expected in an increasingly financialised economy, notably 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), or a clear downward trend in government activity (Figure A7 in the Appendix). However, the importance of trade unions declined sharply since the 1980s (Figure A9 in the Appendix) in line with the characteristics of an increasingly financialised economy.

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3. FINANCIALISATION AND FUNCTIONAL INCOME DISTRIBUTION: AN ECONOMIC MODELISATION

In what follows, we estimate an equation where the labour income share of the total economy is a function of standard variables: technological progress, globalisation, education and the business cycle. In addition, we will introduce four further variables to control and isolate the effects of financialisation on labour income share through the three abovementioned channels: financial activity, government activity, shareholder orientation and trade union membership. The first channel is measured by assessing the share of financial activity in the total economy and the weight of the public sector expenditure on GDP; the second is quantified by the amount of interest and dividends paid by non-financial firms, and the third is measured by the strength of trade unions.

The long-term labour income 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 income 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 income share function, as Stockhammer (2009), Kristal (2010), Peralta and Escalonilla (2011), Dünhaupt (2013a) and Karanassou and Sala (2013). This introduces some limitations; notably it prevents the study of the effect of financialisation on wages of workers from different sectors, industries and/or firms (taking into account their size or ownership). This implies that we are not able to analyse whether financialisation has affected more intensively some groups of firms, as for instance large firms, or firms quoted in the stock market. Yet, the advantage of the macro perspective is that the impact of the phenomenon on the aggregate of workers can be studied. Nonetheless, if financial variables are found to have an effect, we are unable to say whether this is due to the impact of some industries or of large size firms. 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.

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The education, government activity and trade unions variables are expected to have a positive influence on the labour income share. In contrast, the effect of technological progress, globalisation, financial sector activity and shareholder orientation on labour income share is expected to be negative. Finally, the business cycle has an undetermined effect on the labour income share. Thus, the coefficients of these 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 income share because it has become capital augmenting since the early 1980s, whereas it was labour augmenting in the 1960s and 1970s (Stockhammer, 2009; Guerriero and 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 income share of high-skilled labour that does not compensate for the decrease in the labour income share of the low-skilled labour, and thus has caused a fall in the labour income share as a whole.

The degree of globalisation is also expected to be negatively related with the labour income share. The Stolper-Samuelson (1941) theorem postulates that trade raises the return on the factor that is relatively abundant (capital in the case of northern countries) and lowers the return on the other factor (labour in the case of northern countries) - Guerriero and 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 income share.

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

On the other hand, the business cycle may have a positive or a negative coefficient. On one hand, it has a negative effect on the labour income share because this share tends to increase in recessions and decrease at times of recovery (Dünhaupt, 2013a and 2013b). Willis and Wroblewski (2007) offer three potential explanations for the countercyclical behaviour of the labour income 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 and Valdeolivas (2012), the business cycle can also positively influence the labour income share, reflecting the traditional relationship between the business

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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 (diminish) jointly with employment, as suggested by the Phillips Curve.

Finally, the financialisation variables are expected to be related with the labour income share as discussed in the previous section. In fact, the labour income share is expected to depend negatively on the weight of financial activity and shareholder orientation but positively on government activity and trade union representativeness.

It should be noted that although government activity and trade unions are negatively influenced by the growth of finance, they are also determined by other factors. In other words, we cannot attribute the changes in government activity and trade unions' importance exclusively to financialisation. Indeed, we consider them to be indirect channels through which financialisation affects labour income share.

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 on all variables are available for this period and frequency and are suitable for the study for two reasons. On the one hand, 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. On the other hand, the fall in the labour income share is a long-term structural phenomenon, and therefore annual data is likely to capture better the determinants of labour income share than higher frequency data.

Turning now to the definition of the data. We use the adjusted labour income share[3] of the total economy as a percentage of the gross domestic product from AMECO database. The adjusted labour share corresponds to the ratio between the compensation per employee and the gross domestic product at current market prices per employee.

Our dependent variable, the labour income share, is expressed as a ratio and therefore all independent variables are also expressed as ratios (globalisation, education, business cycle, financial activity, government activity, shareholder orientation and trade union) or growth rates (technological progress).

[3] 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).

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We use the usual variable of growth in total factor productivity of the total economy at 2005 market prices as a proxy of technological progress, available on AMECO database. 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) [4].

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

The business cycle is described by the output gap obtained as the difference between actual and potential gross domestic product at 2005 market prices (as a percentage of gross domestic product), from AMECO.

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 total economy (both at current prices and in million of euros), from PORDATA database and Eurostat respectively.

The level of government activity used here is the total general government expenditure as a percentage of gross domestic product 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[5]. Table A1 and Table A2 in the Appendix contain descriptive statistics of the data and the correlation matrix, respectively.

[4] Even though this proxy of globalisation is only related with international trade, our assumption is that it is correlated with another important dimension of the phenomenon, notably foreign direct investment.
[5] Nevertheless and as emphasised by Bassanini and Duval (2006) and the 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.

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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 and Shin (1999) and Pesaran *et al.* (2001). It has the advantage of not requiring the same order of integration for all variables because it can be performed with a mixture of variables that are integrated of order zero and of order one, unlike the cointegration procedures of Engle and Granger (1987) and Johansen (1991 and 1995). In addition, this technique is more suitable for small samples.

We proceed with five steps. First, we conduct unit root tests applying the augmented Dickey and Fuller (1979) (ADF) test and the Phillips and Perron (1998) (PP), 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.

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 and 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:

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

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, where EC_t is the error correction term defined by:

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

Note that $\hat{\phi}(1,\hat{p}) = 1 - \hat{\phi}_1 - \hat{\phi}_2 - ... - \hat{\phi}_{\hat{p}}$ 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, conducting a traditional Wald test on $\hat{\phi}(1,\hat{p})$. 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 or one. However, Pesaran *et al.* (2001) provide the critical values of the lower and the upper bounds, where the lower bound assumes that all variables are integrated of order zero whilst the upper bound assumes that all variables are integrated of order one. 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.

Important 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 income share and the robustness of results are analysed.

5. EMPIRICAL RESULTS AND DISCUSSION

The empirical analysis starts with a study of the presence of unit roots. Plots of our nine variables (Figure A1 to Figure A9 in the Appendix) already seem to indicate that while some of them are stationary in levels, others seem non-stationary. Employing the ADF test and the PP test (Table 1 and Table A3 in Appendix, respectively), we conclude that the null hypothesis that the variable contains a unit root, is rejected at 5% significance level for the labour income share, technological progress, globalisation, business cycle and trade union. These five variables are

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therefore 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 in order to determine whether the differentiated series are already stationary; 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 labour income share including only the four independent variables associated with financialisation (financial activity, government activity, shareholder orientation and trade unions), which is the short version of the model.

We first determine the optimal lag length using information criteria and considering an unrestricted VAR. Note that 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 because at least one root of characteristic polynomial is outside the unit circle (Lütkepohl, 1991)[6]. 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 a maximum order to our ARDL. This software automatically defines the optimal number of lags (up to the defined limit of two) to be incorporated in each variable in the estimation of the ARDL.

[6] Results available upon request.

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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 income 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)[7], which means that the null hypothesis of no cointegration can be rejected. There is therefore evidence supporting the existence of a cointegration relationship between these variables.

After, 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) since here we are estimating the labour income share without the variables of technological progress, globalisation, education and business cycle, which we will add later.

Residuals are normal and homoscedastic. Finally, plots of CUSUM and CUSUMSQ tests (Figure A10 and Figure A11 in the Appendix) suggest that our coefficients are stable over the sample period and confirm the absence of significant structural breaks as the recursive residuals lie between the straight lines at 5% significance levels. More concisely, 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).

In the long-term, only shareholder orientation and trade unions are statistically significant (Table 4). Nonetheless, financial activity and government activity that are statistically insignificant have the expected negative and positive signs, respectively. This seems to partially

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

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confirm the financialisation literature's claim that a rise in financial activity decreases the labour income share and that a rise in government activity increases it. On the other hand, both coefficients of the statistically significant variables have the expected signs foreseen in the literature. The shareholder orientation exerts a negative influence on labour income share; a 1 p.p. rise in financial payments of non-financial firms lowers the labour income share by around 0.258 p.p.. In turn, trade union density is a positive determinant of the labour income 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 most important finding is that the coefficient of the error correction term is negative and it is significant at 1% significance level, confirming that this 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 income 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 income share. The only unexpected result is for the shareholder orientation variable, which has a positive influence on labour income 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 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

Next, we re-estimate the labour income share equation including not only the four variables related with the financialisation process, but also others linked to functional income distribution,

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namely technological progress, globalisation, education and business cycle. This should increase the consistency of our model, 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 income 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 with the inclusion of eight independent variables does not allow the use of a higher number of lags. The criteria LR, FPE and AIC indicate 2 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 most information criteria as well as from FPE and AIC, which we have already argued 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%)[8].

The diagnostic tests in Table 6 show that we cannot reject the null hypothesis of no serial correlation, of normality and 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[9]. The most important change in results is related with the Ramsey RESET test as we can no longer reject the null hypothesis of no misspecification by the LM F statistic; however, we continue to reject the null hypothesis by the LM statistic. Kiviet (1986) notes that in the case of 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 that the long version is more adequate to describe the labour income 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

[8] Note: Critical value bounds of the F-statistic were obtained in Pesaran and Pesaran (2009), considering intercept and no trend and for a number of variables equal to nine.
[9] Results available upon request.

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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) confirms that financial payments of Portuguese non-financial firms are below the European average. This is probably due to Portugal's "bank-based" financial system (Orsi and Solari, 2010), 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 to long term vision of clients' businesses, which entails less pressure on firms to make interest payments.

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 income share in the long-term according to the hypothesis of Estrada and Valdeolivas (2012). A 1 p.p. rise in the level of output gap raises the labour income share by around 0.665 p.p..

As expected, globalisation exerts a negative impact on the labour income share, confirming the Hecksher-Ohlin model and the Stolper-Samuelson theorem. A 1 p.p. rise in the degree of openness of the Portuguese economy leads to a decrease in the labour income share by about 0.304 p.p.. The education level is a positive determinant for the labour income share: a 1 p.p. increase in the upper-secondary schooling increases the labour income share by around 0.224 p.p.. 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 income 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, confirming that this model remains stable and converges to the long-term equilibrium (Table 8). As expected, globalisation still has a negative influence on the labour income share in the short-

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term, while trade union density exerts a positive effect. Surprisingly, financial activity and shareholder orientation are positively related with the labour income 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 impact of shareholder orientation has the same sign as in the short version of the model. Government activity has a positive contemporaneous effect on labour income share but it is negative 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 effect of government activity in the labour income 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 is also worth noting that the results of the long version do not change greatly if we extend our measurement of the weight of financial activity to include the financial and real estate industries. There is still a cointegration relationship between our 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 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 converge 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.

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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 income 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 income 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[11].

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. The existence of cointegration is confirmed at the 10% significance level, the model converges to the long-term equilibrium and results are quite similar. The only exception is the financial activity variable, which becomes statistically significant with a positive coefficient both in the short- and long-term specifications. The most important finding is that the dummy variable is statistically significant and negative, which proves that there were other factors in the years related with the crisis that were not controlled in the model but contributed to the decline in the labour income 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 income share in Portugal. In conclusion, we find evidence supporting the claim that financialisation influenced the labour income 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 the 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.
[11] Results available upon request.

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6. CONCLUSION

The financialisation literature indicates three different ways in which the growth of finance contributed to the observed decline in labour income 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 income share using aggregate annual data and make use of both standard variables (technological progress, globalisation, education and business cycle) and four other measures to reflect the different channels of financialisation (financial activity, government activity, shareholder orientation and trade unions density).

Since the variables are integrated of order zero and also of order one, we use the ARDL bounds testing approach and determine the existence of cointegration between variables. We estimated an ARDL that allows us to distinguish between long-term and short-term effects on the labour income share. In the long-term, only the channels related with government activity and trade unions present a positive and statistically significance effect on labour income share. In the short-term, trade union density is positively related with the labour income share, but financial activity and shareholder orientation have a positive influence on the labour income share in contrast with literature prediction.

However, this share is not only affected by financialisation variables, but also by traditional explanations namely globalisation, education and business cycle and particularly in the long-term. We conclude that the labour income share is positively affected by output gap and education level, but it is negatively affected by the globalisation process. Our sensitivity analysis shows also that technological progress has been capital augmenting in Portugal.

Our findings demonstrate the indirect negative effects of financialisation on the labour income 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.

In this paper, we estimate an aggregate labour income share function, which reveals that financialisation has a harmful impact on aggregate labour income share. Despite possible data difficulties, it would be interesting in future research to analyse the statistical relevance of these channels using firm-level or industry-level data so as to identify the effects of financialisation in

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the labour income share in different sectors, industries or by firm size, as in Lin and Tomaskovic-Devey (2013) and Alvarez (2015).

Dünhaupt (2013b) warns that the adoption of policy measures is crucial to stabilize the labour income share and provides a set of suggestions for that purpose. According to our results and to contain the fall in the labour income share, policy makers should control the downsizing of government activity, foster higher levels of education in the workforce, and work to avoid a decline of the bargaining power of trade unions. Efforts should also be taken to improve the management of Portugal's economic position in the globalised economy.

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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)

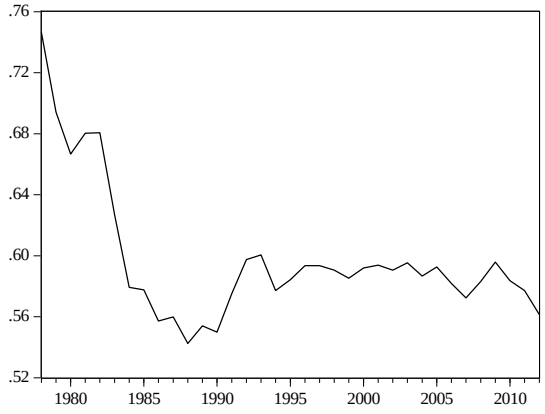

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Figure A2 – Technological progress (annual growth rate)

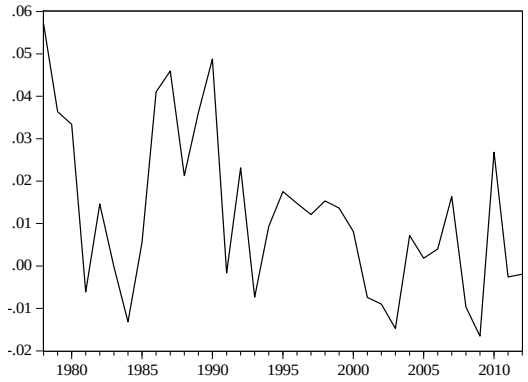

Figure A3 –Globalisation (% of gross domestic product)

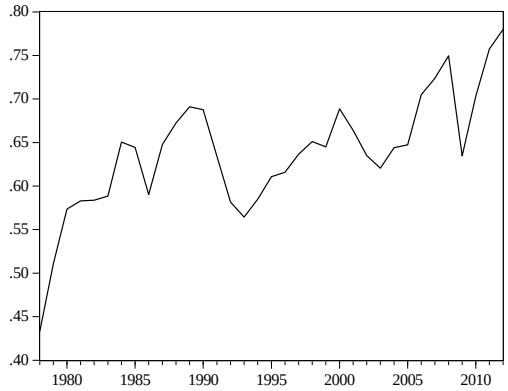

Figure A4 –Education of the labour force (%)

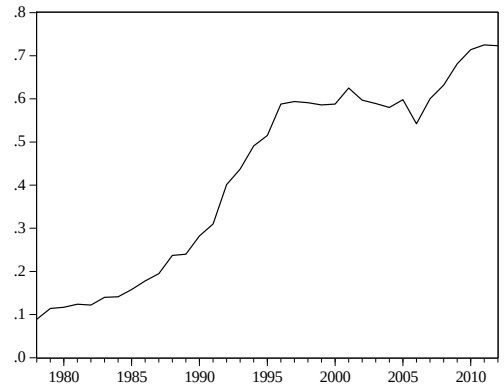

Figure A5 –Business cycle (%)

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

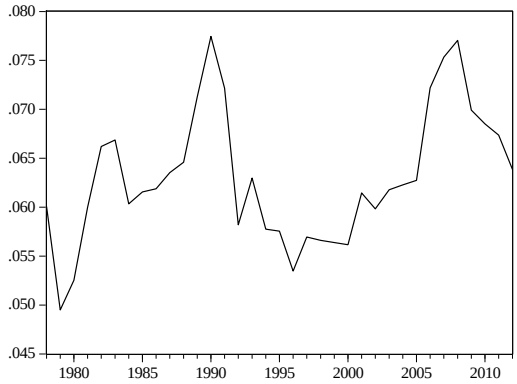

Figure A7 – Government activity (% of gross domestic product)

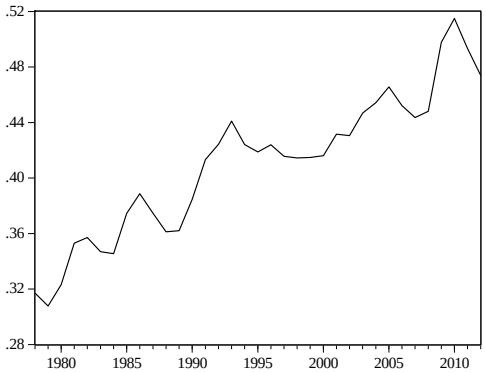

Figure A8 – Shareholder orientation (% of gross value added of non-financial firms)

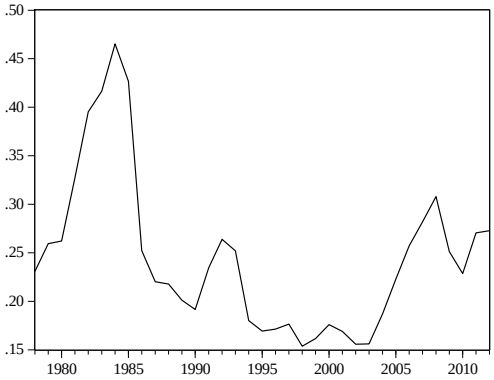

Figure A9 –Trade union density (%)

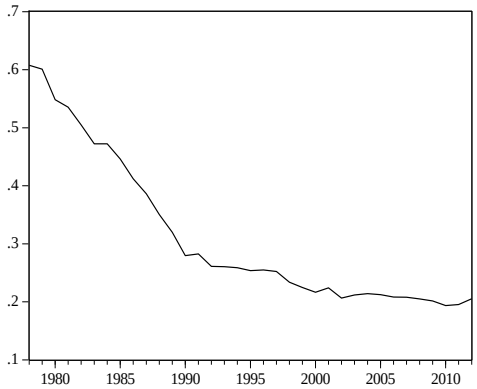

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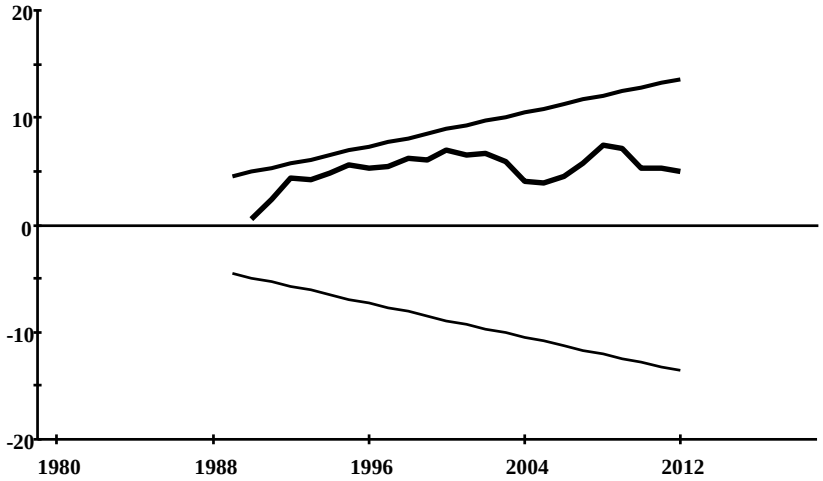
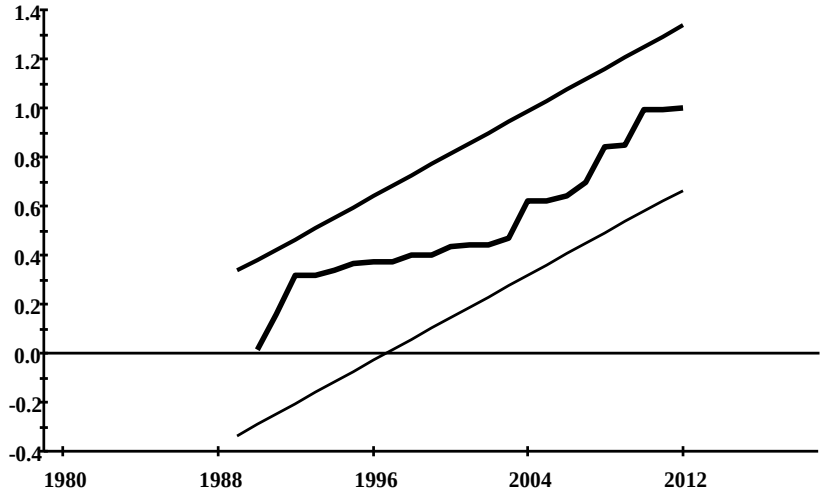
Figure A10 – The plot of cumulative sum of recursive residuals



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

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