Business School and School of Social Sciences and Humanities

Essays on the Portuguese Economy:
The Era of Financialisation

Ricardo Pereira Barradas

A Thesis presented in partial fulfilments of the Requirements for the Degree of:
Doctor in Economics

Supervisor:
Professor Sérgio Lagoa, Assistant Professor
ISCTE-IUL

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"*The real price of everything, what everything really costs to the man who wants to acquire it, is the toil and trouble of acquiring it.*"

(Smith, 1999, p. 119)

"*There are no pains without gains, neither there are no progress and glory without struggle and sacrifice…*"

(Traditional Proverbs)

Resumo

Esta tese de Doutoramento procura avaliar o processo de financeirização em Portugal desde os anos oitenta e uma dimensão particular do mesmo processo nos países da União Europeia desde meados da década de noventa, através da compilação de quatro Ensaios inter-relacionados. O conceito amplo e complexo de financeirização tende a oferecer uma perspectiva negativa sobre o impacto do crescimento da finança na economia, ao contrário da teoria económica convencional que considera o crescimento da finança como um fenómeno geralmente positivo.

Neste sentido, a emergência da financeirização em Portugal é contextualizada segundo uma perspectiva histórica, económica e internacional no primeiro Ensaio. Baseado na análise de vários indicadores, este Ensaio conclui que a economia portuguesa exibe sintomas de financeiração que colocaram em evidência fraquezas estruturais desta economia, desempenhando portanto um papel importante na recente crise da dívida soberana.

O segundo Ensaio procura analisar empiricamente a relação entre a financeirização e o investimento real português através de uma análise econométrica de séries temporais. A financeirização, por um lado, conduz a um aumento dos investimentos financeiros por parte das empresas não financeiras, o que desvia fundos dos investimentos reais (efeito "*crowding out*"). Por outro lado, as pressões em torno da intensificação dos pagamentos financeiros restringem igualmente os fundos disponíveis para a materialização de investimentos reais. Este Ensaio conclui que o processo de financeirização tem contribuído para uma desaceleração do investimento real português, principalmente através do canal dos pagamentos financeiros.

A análise empírica do segundo Ensaio é estendida para os países da União Europeia no terceiro Ensaio usando uma análise econométrica em dados de painel. Este Ensaio conclui que o processo de financeirização tem penalizado o investimento real nestes países, principalmente através dos pagamentos financeiros. Este Ensaio identifica ainda que o processo de financeirização causa um abrandamento mais acentuado do investimento real nos países mais financeirizados, o que acaba por se revelar uma conclusão importante para uma economia menos financeirizada como a portuguesa.

O quarto Ensaio procura avaliar empiricamente a relação entre a financeirização e a parcela dos rendimentos do trabalho em Portugal, conduzindo uma análise

econométrica de séries temporais. O processo de financeirização tende a aumentar a desigualdade na distribuição funcional do rendimento, visível na crescente importância dos lucros em detrimento da parcela dos rendimentos do trabalho, o que ocorre através de três canais: a mudança na composição sectorial da economia (aumento do peso do sector financeiro e diminuição do peso do sector público), a filosofia subjacente à criação de valor para o acionista e o enfraquecimento dos sindicatos. O Ensaio conclui que o processo de financeirização tem sido responsável pela evolução da parcela dos rendimentos do trabalho, sobretudo por via do peso do sector público e dos sindicatos.

De forma geral, esta tese de Doutoramento oferece evidência adicional que o processo de financeirização também afecta negativamente e sobre diferentes primas economias mais pequenas, menos desenvolvidas e mais periféricas, como Portugal.

Palavras-Chave

Economia Portuguesa, União Europeia, Financeirização, Crise da Dívida Soberana, Empresas Não Financeiras, Desigualdade na Distribuição Funcional do Rendimento

Classificação JEL

E12 e E44

Abstract

This PhD thesis aims to assess the financialisation process in Portugal since the early 1980s and a particular dimension of the respective process in the European Union countries since the mid-1990s, through the compilation of four inter-related Essays. The broad and complex concept of financialisation tends to offer a negative perspective on the impact of growth of finance in the economy, contrary to the predictions of mainstream economics that considers the growth of finance as a general positive phenomenon.

In that sense, the emergence of financialisation in Portugal is contextualised in an historical, economic and international perspective in the first Essay. Based on the analysis of several indicators, this Essay concludes that the Portuguese economy exhibits symptoms of financialisation that put in evidence its structural weaknesses and played an important role on the recent sovereign debt crisis.

The second Essay aims to address empirically the relationship between financialisation and the Portuguese real investment through a time series econometric analysis. Financialisation, on the one hand, leads to a rise of financial investments by non-financial corporations, which deviates funds from real investments ("crowding out" effect). On the other hand, strong pressures around the intensification of financial payments restrain funds available for real investments. This Essay concludes that the financialisation process has hampered the Portuguese real investment, mainly through the channel linked with financial payments.

The empirical analysis of the second Essay is extended to the European Union countries in the third Essay using a panel data econometric analysis. This Essay concludes that the financialisation process has also damaged real investment in European Union countries, mainly through the financial payments channel. The Essay is also able to identify that the financialisation process causes a higher slowdown in real investment in the more financialised countries, which represents an important conclusion for a less financialised economy like Portugal.

The fourth Essay aims to assess empirically the relationship between financialisation and the Portuguese labour income share, conducting a time series econometric analysis. The financialisation process tends to increase the inequality on functional income distribution, visible in the growing importance of profit share in

detriment of labour income share, which occurs through three channels: the change in the sectorial composition of the economy (due to the increase of the weight of financial activity and the decrease of government activity), the shareholder value philosophy and the weakening of trade unions. The Essay finds evidence that the financialisation process affected the evolution of the Portuguese labour income share, namely trough changes in government activity and in trade union density.

Overall, this PhD thesis offers further evidence that the financialisation process also affects negatively and from different prisms the smaller, less developed and more peripheral economies, such as Portugal.

Keywords

The Portuguese Economy, European Union, Financialisation, Sovereign Debt Crisis, Non-Financial Corporations, Inequality on Functional Income Distribution

JEL Classification

E12 and E44

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The usual disclaimer applies.

Ricardo Barradas

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List of Abbreviations

ABRR	Asset-Based Reserve Requirements
ADF	Augmented Dickey and Fuller
ARDL	Autoregressive Distributed Lag
CUSUM	Cumulative Sum (of Recursive Residuals)
CUSUMSQ	Cumulative Sum of Squares (of Recursive Residuals)
EA	Euro Area
ECB	European Central Bank
EU	European Union
FE	Fixed-Effects
FESSUD	Financialisation, Economy, Society and Sustainable Development
GDP	Gross Domestic Product
IMF	International Monetary Fund
IRF	Impulse Response Function
NFC	Non-financial Corporation
OECD	Organisation for Economic and Co-operation and Development
PCSE	Panel Corrected Standard Errors
PP	Phillips and Perron
PPP	Public-Private Partnership
RE	Random-Effects
ROA	Return on Assets
SGP	Stability and Growth Pact's
UK	United Kingdom
US	United States (of America)
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VIF	Variance Inflation Factors

I. Introduction

1. General Background: A Systematic Literature Review

1.1. Introduction

This first Section presents a state of art[1] around on the emergence and the growth of financialisation in the last three decades in the majority of developed economies. This evolution was marked by three different stages (financial repression, financial liberalisation and development, and financialisation). Each stage meant a different impact of the financial sector in the real economy or in society.

The remainder of this Section is organised as follows. Section 1.2. presents the main theoretical and empirical arguments that were used to support financial liberalisation and development, which imposed the respective deregulation of the financial sector. Some negative effects resulting from that liberalisation process are highlighted in Section 1.3.. In Section 1.4, we discuss the concept of financialisation and the conditions that favoured its emergence. Section 1.5. presents the main features and effects related with the financialisation process all over the world. Section 1.6. makes concluding remarks.

1.2. From Financial Repression to Financial Development

It is widely acknowledged that the financial sector plays a crucial role in any economy, functioning like a motor to economic growth, social progress and general development. In fact, the belief that "*financial markets contribute to economic growth is a proposition too obvious for serious discussion*" (Miller, 1998, p. 14). Hein (2009) also recognises that it is "*broadly accepted that the development of the financial sector of an economy is crucial for real economic growth*" (Hein, 2009, p. 2).

This argument has been used to support the financial development during the last decades, visible in the growth of the financial sector and in the emergence of new financial instruments, financial institutions and financial markets, which aim to support economic growth. In the view of Sawyer (2014), financial development can be viewed

[1] This state of art is already published in Working Paper Series of Dinâmia'CET-IUL and it was included as a Chapter in a book edited by Nova Publishers (*Advances in Applied Business Research: The L.A.B.S. Initiative*).

as the growth and evolution of the financial sector (in terms of deposits, loans and stock markets), upward changes in the scale of the financial sector and financial innovations.

As suggested by Sawyer (2014), the positive relationship between the development of the financial sector and economic growth is related with the effects of the financial sector on savings, investment funding and the quality of investment. According to this author, the financial sector has two main functions that are indispensable to economic growth, namely the reallocation of savings and the provision of funding for investments.

Effectively, Schumpeter (1911) had already noted that a necessary element for innovations is the ability of the financial sector to extend credit to the entrepreneurs. He argues that somebody could only become an entrepreneur if previously have becoming a debtor, since entrepreneurs need credit (or other forms of funding) to materialize their innovations.

In the same fashion, Levine (2005) emphasises that the financial sector is crucial to promote economic growth, since it produces information *ex ante* about investments; allocates capital; monitors investments; exerts corporate governance after providing funding; facilitates the trading of both financial and non-financial assets; offers diversification of risk and risk management services; mobilizes and pools savings to finance investments; and eases the exchange of goods and services.

Palley (2007) adds that conventional economic theory also supports the growth of the financial sector due to five essential reasons. Firstly, conventional economic theory looks at the relationship between corporations and financial markets in terms of an agency problem (Jensen and Meckling, 1976), advocating that "shareholder value orientation" is the appropriate and logical goal of corporations. Secondly, conventional economic theory considers financial assets as contingent claims (Arrow and Debreu, 1954). According to this view, finance enhances efficiency since financial markets help to foresee future economic outcomes and allow economic agents to assemble portfolios with better combinations of returns and risk. Thirdly, conventional economic theory refers to Friedman's (1953) argument that financial speculation is stabilizing by driving prices back to the level warranted by their fundamentals. Fourthly, conventional economic theory highlights that increased trade volumes rises market liquidity and therefore market prices are less susceptible to small random disturbances or manipulations by individual participants. Fifthly, conventional economic theory tends to consider that the development of the financial sector induces investments by

corporations when the market price of capital is higher than its replacement cost (theory of Tobin's q), which provides an indication that capital is scarce and that profitable investment opportunities are available.

Similarly, Orhangazi (2008a) highlights that conventional economic theory claims that the financial sector is fundamental to promote investments by corporations by providing funding, increasing the efficiency in resources allocation by screening and monitoring investments, removing market imperfections, reducing transaction costs and providing risk management services.

On one hand, the claims of mainstream economics on the advantages provided by the financial sector operated as a motto to legitimise the financial liberalisation and deregulation of the financial sector in the last decades. As recognised by Stockhammer (2010), supporters of financial liberalisation and deregulation argue that they are beneficial by providing a superior way of dealing with risk. In fact, they make the financial system more stable and society better off (International Monetary Fund (IMF), 2006). Stockhammer (2010) gives the example of securitisation, which allowed to split the risk into different parts and allocate them to those who were best equipped to hold them.

On the other hand, the emergence of several empirical studies finding a positive relationship between financial development and economic growth also seems to have contributed to accelerate financial liberalisation and deregulation (Sawyer, 2013a and 2014).

Levine (2005) refers that a growing body of empirical literature through corporation-level studies, industry-level studies, individual-country studies, panel data studies and broad cross-country comparisons demonstrates a strong positive relationship between the good functioning of the financial system and the long-term economic growth. Ang (2008) surveys the main results of cross-country-studies, finding that the majority of them indicate that the financial sector exerts a positive effect on economic growth. Arestis *et al.* (2015) conduct a meta-analysis on the existing empirical literature on the effects of financial development on economic growth, finding that there is a statistically significant and positive effect of financial development on economic growth.

Overall, this contributes to construct the thesis that financial repression, characterized by several regulations and restrictions on financial markets and on the

banking system, is detrimental to economic development since they restrain the quantity and quality of investments (Mckinnon, 1973; and Shaw, 1973).

According to Sawyer (2014), financial repression is commonly referred as a higher degree of regulation of the financial and banking systems in many countries, which typically involves the direct control by the central bank or by the government of the level of interest rates that can be charged on loans or paid on deposits, the products that can by supplied by banks (or other financial institutions) and the volume, direction and allocation of credit.

Epstein (2005a) also notes that financial repression involved financial regulations and State-owned or State-directed banks that were used to support a wide range of economic and social purposes. He adds that central banks in developed and developing countries imposed some regulations on financial institutions in order to direct credit to specific sectors.

Thus, a period of financial repression gave rise to a period of financial liberalisation in order to achieve a higher development of the financial sector that could contribute to higher levels of economic growth. Financial liberalisation implied internal and external measures, like the elimination of regulations, removal of interest rates ceilings, the reduction of reserve requirements, the abolition of directed credit programmes and the elimination of capital controls (Sawyer, 2014 and 2015). Sawyer notes that this process implied an upward adjustment of the real interest rates to its equilibrium levels. So, the allocation of credit would be determinated by the free market, which would guarantee that investment projects with low returns would be eliminated contributing to increase the levels of efficiency. In the same vein, the increase of real interest rates and the lower reserve requirements would allow a rise in savings and an increase in the supply of credit, which would induce higher volumes of investment and therefore higher levels of economic growth and more employment creation.

Effectively, Demir (2009) agrees that financial liberalisation favours the growth of capital markets, reduces agency costs, decreases the asymmetry of information and increases the levels of efficiency. He claims that this process could exacerbate a transfer of savings to more efficient projects at lower costs, which is expected to boost investment and economic growth.

Figure 1 contains the main advantages – referred in the literature – provided by the financial sector, which legitimated the adoption of several measures in order to liberalise and deregulate the financial sector.

Figure 1 – Main advantages provided by the financial sector

Advantages of the financial sector	Transfers funds from savers to borrowers (i.e. the intermediation process) Provides credit to entrepreneurs Produces information *ex ante* about investments Monitors investments Facilitates the diversification of risk Provides risk management services Increases efficiency by foreseeing future economic outcomes Underestimates financial speculation by considering it as stabilizing Rises market liquidity Provides a superior way of dealing with risk

Source: Authors' representation

Against this backdrop, the realm of finance acquired a great prominence in the most developed economies in the last three decades, fuelling the popular perception that finance is increasingly dominating the real activity and the everyday life of citizens (e.g. Krippner, 2005 and 2011; Epstein, 2005b; Palley, 2007; Orhangazi, 2008a; Davis, 2009; and Stockhammer, 2010), such that "*it is difficult to escape the impression that we live in a world of finance*" (Krippner, 2005, p. 173).

1.3. Excessive Financial Deepening

Nonetheless, Kose *et al.* (2006) and Prasad *et al.* (2007) found little evidence that financial liberalization conducted to a best economic performance all over the world, adding that further research should be carried out in order to derive policy conclusions regarding the effects of the deregulation of finance, mainly with respect to foreign capital inflows.

Rousseau and Wachtel (2011) also refer that the relationship between financial development and economic growth weakened in the last years. They even recognise that this relationship is now not so strong as until the end of 1990s, presenting several explanations for that. First, they state that the incidence of financial crises is related to the dampening of the effect of financial development on the economic growth. Second, they conclude that the rapid growth of credit led to inflation episodes and weakened banking systems. Thirdly, they argue that the excessive financial development could be a result of widespread financial liberalisation since the 1980s accompanied by the

absence of legal and regulatory infrastructures to exploit financial development successfully.

Additionally, Cecchetti and Kharroubi (2012) alert that the size of financial sector has an inverted U-shaped effect on economic growth. This means that, from a certain threshold, a further enlargement of the financial sector can reduce real economic growth. Based on a sample of developed and emerging economies, they also find that the growth of the financial sector could be a hurdle to productivity growth, namely because the financial sector competes with the rest of the economy for scarce resources and therefore financial booms are not growth enhancing.

The same conclusion is provided by Dabla-Norris and Srivisal (2013), who refers that the beneficial role of financial deepening in dampening the volatility of consumption, investment and output across countries only occurs up to a certain threshold. They state that the growth of the financial sector to high levels (as those observed in many advanced economies) amplifies the volatility of consumption and investment.

Barajas *et al.* (2013) also reinforces that there is considerable empirical evidence supporting that there is a positive, but non-linear, relationship between financial deepening, economic growth and macroeconomic volatility. They stress that the strong growth of credit has increased bank fragility and the likelihood of a systemic banking crisis. They still report that Barajas *et al.* (2012) find evidence of a positive effect of financial development among middle-income countries, whilst Rioja and Valev (2004a and 2004b) and Aghion *et al.* (2005) find a declining effect of financial development on economic growth as countries become richer.

Beck *et al.* (2014) also confirm that financial systems have grown expressively all over the world, which has occurred simultaneously with a higher volatility of the financial sector in relation to the economy as a whole. Based on a sample of 77 countries for the period between 1980 and 2007, they find that the size of the financial sector (measured by the gross value added of financial activities in total gross domestic product (GDP)) and the level of intermediation (proxied by the natural logarithm of the ratio of credit to GDP) do not have a statistically significant impact on long-term economic growth or on volatility. They also show that the size of the financial sector and the level of intermediation are not associated with higher economic growth in the medium-term in the majority of these countries.

Indeed, the size of financial sector, traditionally measured by the importance of bank deposits and/or by the stock market valuation in relation to the GDP, rose expressively in the recent years, increasing fears that it can became too large and increasing doubts on the positive "finance-growth nexus" (Sawyer, 2014). He recognises that the growth of the financial sector has not been associated with a faster economic growth, being somewhat slower over the past three decades in Western industrialised economies.

Effectively and as stressed by Sawyer (2014 and 2015), the positive relationship between the financial sector and economic growth has weakened and even reversed in the recent years. He highlights that this relationship could be even more negative, since the majority of empirical works regarding this topic uses bank deposits and/or the size of stock markets as proxies to financial development neglecting other forms of expansion of the financial sector in the last decades related with the proliferation of derivatives, securitisation, shadow banking and the scale of financial asset transactions relative to the levels of savings and investment.

Two traditional explanations are presented to clarify this reversal in the relationship between financial development and economic growth (Sawyer, 2014). The first is related with the idea that financial sector also absorbs resources (often highly paid), which are then not available to real sectors (i.e. non-financial productive sectors). The second is related with the "too big financial sector" hypothesis, according to which the strong growth of the financial sector has weakened the positive link between savings and investments. This happens due to the liquidity function of the financial sector, which could simply induce the exchange of financial assets (i.e. rearrangement of asset portfolios) by savers without generating funds to investors.

Menkhoff and Tolksdorf (2001) also express that there has been a change in the role of the financial sector during the last decades. They advocate that, in the past, the financial sector supported and boosted directly economic growth ("optimistic view"), through a "supportive relationship". Nonetheless, this relationship altered expressively in the last ten or twenty years, and events of the financial sphere started to follow their own logic and, therefore, the real economy began to adapt by itself to the consequences of this. This is the "pessimistic view" regarding the role of the financial sector and the real economy, which has produced a kind of "disruptive relationship" between them, which these authors call the "decoupling hypothesis" between the financial sector and the real economy.

In fact and as recognised by Sawyer (2014), the financial liberalisation exacerbates the instability of the financial system as a whole. As for instance, Freeman (2010) highlights that historical experience in the last few decades illustrates the impact of deregulation of finance, notably in the episode of the United States (US) savings and loan crisis in the 1980s, the Japanese asset-price bubble in the end of 1980s, the Swedish financial crisis in 1992, the collapse of Long-Term Capital Management in 1996, the Asian financial crises in 1997, the 'dot.com bubble', the bankruptcy of Lehman Brothers, among other episodes. These events are demonstrations of the unsustainable nature of liberalisation and deregulation of the financial sector and of capital controls.

Figure 2 presents the main problems – appointed by the literature – caused by the strong liberalisation and the respective deregulation of the financial sector in the last decades.

Figure 2 – Main problems caused by the liberalisation and deregulation of the financial sector

Excessive financial deepening	Higher instability of the financial system Higher incidence of financial crises Inflation episodes Weaker banking systems Higher volatility of the aggregate demand Resources absorption by the financial sector (less resources to the real economy) Weakening or reversal in the relationship between savings and investments

Source: Authors' representation

Stockhammer (2010) also recognises that this excessive financial deepening was caused by a set of measures to deregulate the financial sector and to liberalize international capital flows. He agrees that some of these measures were a reaction to the increase of activities by private agents to circumvent financial regulations. The same idea is shared by Orhangazi (2008a), who defends that the liberalisation of finance was accompanied by the emergence of financial innovations aimed at both circumventing financial regulations and responding to adverse macroeconomic conditions.

1.4. The Concept and the Emergence of Financialisation

In general terms, the financial liberalisation and deregulation seem to have originated an excessive financial deepening with negative repercussions on the economic and social spheres. This negative relationship between the financial sector and the economic and social outcomes has been commonly called as financialisation or

finance-dominated capitalism[2], translating the deleterious effects of financial deepening in the majority of world economies.

There is not a unique and generally accepted definition of financialisation (Krippner, 2004; and Leiva and Malinowitz, 2007). Note that "*financialiazation is a short-hand expression for a number of developments over the last 30 years. The term is convenient but these developments may not have the coherence and unity suggested by the term and they may not signal the transition to some new 'regime'*" (Skott and Ryoo, 2008, p. 24). The same idea is shared by Dore (2008), who postulates that "*'financialisation' is a bit like 'globalization' – a convenient word for a bundle of more or less discrete structural changes in the economies of the industrialized world*" (Dore, 2008, p. 1097).

Anyhow, one of the broadest concepts defines it as "*[…] the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operations of the economy and its governing institutions, both at the national and international level"* (Epstein, 2001, p. 1).

As recognised by Hein (2012), this is a broad and widely accepted definition of financialisation but lacks analytical precision. Sawyer (2013a) reiterates that this probably became the most widely cited definition of financialisation, albeit it underplays the influence of finance on society, does not specify the time period or geographical space to which it operates and does not provide any analytical framework for its study.

After presenting the aforementioned definition of financialisation, Epstein (2005b) adds the financialisation process exists in the most developed economies since the 1980s and has been characterized by the significant increase in financial transactions, the rise of real interest rates and higher profitability of financial corporations in relation to the non-financial corporations (NFCs).

Different authors tend to present other definitions of financialisation, emphasising other dimensions of that phenomenon. Lee *et al.* (2009) refer that it is possible to identify 17 concepts of financialisation on the literature and recognises that could be exist even more. French *et al.* (2011) alert that there is a danger that financialisation could become a "chaotic concept" or a "blanket term" that covers a range of related (but different) phenomena.

[2] These two expressions are normally used as interchangeably. Henceforth, we will only refer to the concept of financialisation.

Despite this conceptual heterogeneity, all definitions of financialisation typically offer a negative perspective on the impact of excessive financial deepening in the real economy and in society. This process has gained momentum more recently in the wake of successive international financial crises (especially after the collapse of the US subprime crisis in 2007) and the resurgence of corporate scandals in the last two decades. Duménil and Lévy (2004) note that not all social classes are affected on the same degree by these types of crises or scandals. Some social classes are even favoured handsomely with finance benefits, whilst others (traditionally the general population) are strongly injured.

The origins of the concept of financialisation are not so clear, although it seems to have appeared in the early 1990s (Sawyer, 2013a; and Vercelli, 2013). As a structural transformation of the economies, the financialisation process dates back to the 1970s or 1980s, in a context where occurred a strong transformation in the relationship between the financial sector and the real economy.

Kus (2012) notes that the financialisation process began in the US economy during the early 1980s, due to the adoption of a set of deregulatory reforms by Ronald Reagan Administration ("Reaganomics"), based on supply-side economics, liberal orientations and a laissez-faire philosophy.

Sawyer (2013a) reiterates that the dating of the financialisation process coincides with the emergence of an era of globalisation and neoliberalism during the administration of Ronald Reagan in the US and Margaret Thatcher in the United Kingdom (UK). This period was strongly marked by the growth in the volume of financial transactions, the liberalisation and deregulation of the financial sector and the emergence of securitisation.

Vercelli (2013) states that this process started before, in the 1970s, particularly with the end of Bretton Woods[3] period in 1971, due to the beginning of a new era of deregulations undertaken by Richard Nixon's administration, which was characterized by the adoption of neoliberal policies and respective abandonment of Keynesian policies and full employment goals.

Tomaskovic-Devey *et al.* (2015) reiterates that this process occurs since the 1980s in the US with a substantial transformation from a "manufacture-driven" to a "finance-orientated" economy.

[3] The Bretton Woods System was created after the 2nd World War, according to which there were a strong international financial regulation based on fixed exchange rates and a dollar standard tied to the gold.

Freeman (2010) confirms that laissez-faire policies were endorsed by most economic leaders in the US and other advanced economies and by most of the international financial agencies (IMF, World Bank, among others), who were convinced by theory, ideology or by the influence of the leaders of financial institutions, which aimed to profit more in a less regulated financial environment.

These three phenomena – financialisation, globalisation and neoliberalism – appear to have evolved simultaneously during the last decades, and they seem to be dependent of each other. Orhangazi (2008a) recognises that globalisation and neoliberalism accompanied the evolution of financialisation. Fine (2011) stresses that globalisation and neoliberalism are both "elder siblings" of financialisation. He also adds that during the last thirty (or more) years neoliberalism has exacerbated the ideologies of non-intervention and efficacy of market forces, promoting the interests of private capital in general and of finance and financialisation in particular.

French *et al.* (2011) advice that it is clear that financialisation and neoliberalism are constituent of each other, albeit recognising that the order of their emergence and the direction of causality between them remain inconclusive. Lucarelli (2012) recognises that neoliberalism – framed by financial deregulations, privatisations and greater labour market flexibility – provided the necessary conditions for the emergence of financialisation. Hein (2012) also stresses that financialisation is interrelated and overlaps with neoliberalism.

Vercelli (2013) reinforces that the timing of financialisation broadly overlaps with the timing of globalisation, recognising that the financialisation process may only occur with the reduction of spatial constraints to exchanges (e.g. removal of trade barriers) and that the process of globalisation was supported by internationalised finance. He also adds that the processes of financialisation and globalisation require a liberalisation of cross-country flows of goods, services and capital. Van der Zwan (2014) also states that globalisation and financialisation are not mutually exclusive analytical frameworks, but they are two sides of the same coin.

Despite the inexistence of a clear consensus related with the exact definition and the respective dating of the emergence of the financialisation process, the literature is unanimous to consider that the financialisation is not an isolated phenomenon that occurred independently of other economic and social transformations, instead was supported by the adoption of neoliberal policies and deregulatory reforms.

1.5. Features and Effects of the Financialisation Process

Against this background, Crotty (2005) highlights the existence of a "neoliberal paradox" in the financialisation process. He sustains that the demand of financial markets for more profits and higher stock prices could have an adverse effect on NFCs, because they responded to this pressure by cutting wages and benefits to workers, engaging in frauds and deceptions to increase apparent profits and moving into financial operations to increase profits, which ultimately delineates a stagnation of real economic growth in the medium and long-term.

This seems to illustrate the fragility and the unsustainable nature of the financialisation process and its negative impacts on the real economy and on social development. Some authors have even argued that the financialisation process has contributed to the subprime crisis in the US economy and to the Great Recession of 2008-2009 in Europe (e.g. Freeman, 2010; Stockhammer, 2010; Kedrosky and Stangler, 2011; and Hein, 2012). In fact, "*after 2008 it became clear that financialization has the capacity to introduce instability into the US and other economies*" (Tomaskovic-Devey *et al.*, 2015, p. 1).

Menkhoff and Tolksdorf (2001) highlight the growing importance of stock markets, capital flows and international financial transactions as a demonstration of the financialisation process during the last three decades. Krippner (2005) looks to financialisation as the accumulation of profits from financial activities instead of other activities. Blackburn (2006) characterises financialisation as the increasing and systemic power of finance and financial engineering. Crotty (2007) argues that financialisation corresponds to a process where financial interests overlap the economic, social, environmental and political interests. Skott and Ryoo (2008) also argue that financialisation is associated with a number of international developments, such as the shift in monetary policy toward a near-exclusive focus on price stability, the increase of financial flows at both national and international levels, the improvement of financing conditions for households, the change in corporate governance through the alignment of managerial incentives with shareholder interests, and the increased influence and importance of financial institutions and institutional investors. Fine (2010) considers financialisation as the subjugation of economic activity to the logic and imperatives of capital. Stockhammer (2010) highlights that financialisation is used to refer the changes in the relation between the financial and the real sector, encompassing diverse phenomena, such as the emergence of "shareholder value orientation", increasing

household debt, changes in behaviour of individuals (e.g. greater use of financial products), increasing incomes from financial activities by households and corporations, increasing frequency of financial crises and increasing international capital mobility. Vercelli (2013) postulates that financialisation designates a process characterised by an increasing weight and importance of finance or the financial side of economic decisions. Van der Zwan (2014) recognises that financialisation covers a host of empirical phenomenon at different levels of analysis, identifying it as a new regime of accumulation, the ascendancy of the "shareholder value orientation" and the encroachment of finance into the realms of everyday life.

Following Fine (2011), the FESSUD[4] Description of Work (2011) recognises that financialisation is a complex term because it contains several different dimensions and aspects. As exhibited in Figure 3, FESSUD (2011) discusses financialisation in terms of eight features, which have empirical support since the early 1980s (Sawyer, 2013a).

Figure 3 – Features of financialisation

Features of financialisation	Expansion and proliferation of international financial markets Deregulation of the financial system and of the economy in general Emergence of new financial instruments, services, institutions and markets The dominance of finance over industry Rise of inequality deriving from market mechanisms and other public policies Extension of credit that sustains the level of consumption Penetration of market and financial logics in both economic and social spheres Emanation of a culture oriented to individualism, self-interest, rationalism and market values

Source: Authors' representation based on FESSUD (2011)

Fine (2011) admits that these eight features were designed not only based on the US experience that he considers as the world's leading financial power, but also complemented with the experiences of the UK and other developed economies. Palley (2007) also recognises that financialisation seems to be more developed in the US economy. French *et al.* (2011) mention that the US and the UK are considered to be exemplar financialised economies.

However, Sawyer (2013a) adds that these features should be viewed as characteristics of the financialisation process in the Western industrialised economies,

[4] FESSUD is the acronym to "Financialisation, Economy, Society and Sustainable Development" Project, funded by the European Commission under Framework Programme 7 with a contract number 266800. The FESSUD Project aims to evaluate the changing on the role of the financial system during the last decades, involving the participation of some European partners, including Portugal through Centre for Social Studies – University of Coimbra and Dinâmia'CET-IUL. It is coordinated by a team from the University of Leeds in the UK and headed by Professor Malcolm Sawyer. For more information regarding the FESSUD project, please see http://fessud.eu/.

albeit recognising that the nature and speed of them varies between different countries. Vercelli (2013) agrees that the financialisation process has never been homogenous through time and space, since it is affected by cultural, material and political conditions that vary with time and place. Sawyer (2015) reiterates that the financialisation process is not uniform across countries and time.

In light of this, Power *et al.* (2003), Jayadev and Epstein (2007), Leiva and Malinowitz (2007), Palley (2007) and Orhangazi (2008a) also refer that financialisation is a common phenomenon across the majority of industrialised economies, including many economies that lie outside the core of the world economy.

Indeed, as recognised by Sawyer (2013b and 2014), there is a dichotomy in the national financial systems around the world, based on the differences between a "bank-based (or dominated) financial system" and a "market-based (or dominated) financial system", that could be useful to explain the heterogeneous of the financialisation process over time and place. Anyhow, both of them tend to be view in terms of the relationship between savings and investment.

According to Demirgüc-Kunt and Levine (2001), the "bank-based (or dominated) financial system" – presented in Germany and Japan – is characterised by the importance of banks on the mobilisation of savings, allocation of capital, supervision of the investment decisions of managers, and provision of risk management services. In the "market-based (or dominated) financial system" – presented in the US and in the UK – there is a higher preponderance of securities markets (vis-à-vis banks) in the intermediation process, corporate control and risk management.

Orsi and Solari (2010) also advance that the financial systems of Southern European economies are based on the first typology: banks control credit, the stock exchange and investment in shares, by acting as advisers, mediators, issuers, treasurers and investors. They sustain that, in those countries, banks are able to decide who can invest, where can invest, who makes profits and who loses.

Sawyer (2013b) presents a general critique to this dichotomy by considering that all financial systems require banks and almost all operate with stock markets and engage in market activities. Nonetheless, both types of financial systems have proved to be supporters of financialisation and give a weak support to investment (Sawyer, 2015). On the one, banks traditionally aim to maximise profits and therefore they tend to not allocate funds and loans to less profitable investments in the short-term but that are more socially desirable in the long-term. On the other, the stock market has

demonstrated a limited role in the intermediation process, since the inflows of funds to corporations through equity markets are small and sometimes negatives.

Palley (2007) expresses that the financialisation process is often associated with a slower real economic growth. According to him, the financialisation process could imply a downward trend of real economic growth, also elevating the importance of the financial sector in relation to the real sector, transferring income from the real sector to the financial sector and promoting income inequality and wage stagnation. This author still concludes that the financialisation process makes economies more vulnerable to debt-inflation episodes and prolonged recessionary environments.

Stockhammer (2010) also adverts that the financialisation process has been characterised by a sluggish overall economic performance with increasing financial fragility due to rising debt levels. Van der Zwan (2014) confirms that financialisation has increased the vulnerability of economies worldwide.

Notwithstanding, the theoretical and empirical research on financialisation has often been focused on the US, the UK and on economies of the centre, neglecting the specificities and dynamics of financialisation on the periphery (Becker *et al.*, 2010 and French *et al.*, 2011).

Yeldan (2000) concludes that the financialisation had a negative impact on economic growth, unemployment and income distribution in Turkey. He adds that finance has gained supremacy over other industries, which has proved to be harmful to the relationship between growth and productivity and to the intermediation process for real investments.

The same conclusion is obtained by Assa (2012), who confirmed that the financialisation has definitely taken place in all countries of the Organisation for Economic and Co-operation and Development (OECD) with negative consequences on growth, employment and equality. He performs a panel data econometric analysis for the OECD countries, using the gross value added of financial activities and the employment of financial activities as proxies for financialisation. These two variables have a statistically significant and negative impact on economic growth, employment and personal equality.

Leiva and Malinowitz (2007) suggest that the financialisation has deteriorated the real economic performance of the North (developed) and South (developing) economies, namely delineating weak growth rates and lower levels of employment due to a decline of productive investments. Other consequences of that phenomenon include

the deregulations of labour-capital relationship, the intensification of mergers and acquisitions to boost profits and shareholder value and, the reduction of the room of manoeuvre of public policies and the rise of inequality levels.

Becker *et al.* (2010) focus their analysis on the financialisation process in two countries from Latin America (Brazil and Chile) and other two from Eastern Europe (Serbia and Slovakia). He finds that this phenomenon has been extremely crisis-prone in all these four cases, also adding that the crisis faced by them has fostered the adoption of measures (promoted by the IMF or other international institutions) that feed the financialisation process, such as privatisations of pension systems in Chile and Slovakia. In this regard, Fine (2011) also claims that the policies promoted by the IMF or World Bank to minimise the severity of the crises in the past also stimulated the financialisation process, namely by reinforcing efforts to open up economies to the international financial capital.

Sawyer (2013a) argues that has emerged much theoretical and empirical work regarding on the deleterious effects of the financialisation process on economic and social performance. FESSUD (2011) summarises this claim through six general harmful effects, as demonstrated in Figure 4.

Figure 4 – General effects of financialisation

Effects of financialisation	Reduction of the level and efficacy of real investments as funds diverted to financial activities Prioritisation of shareholder value or financial worth in detriment of other values and goals Extension of market mechanisms to the economic and social public policies Extension of unwelcome influence of finance over economic and social policies Place more aspects of economic and social life at risk of volatility from financial instability Encouragement of forms of culture and governance that affect the design of economic policies

Source: Authors' representation based on FESSUD (2011)

More specifically, Stockhammer (2010) and Lapavitsas (2011) notes that the financialisation process has also had profound effects on the majority of economic agents. Most of them arise from the aforementioned general effects of financialisation. They stress that households have become more financialised through a strong dependence of credit (especially for mortgage purposes), which has increased their debt levels and induced unsustainable levels of consumption (normally being considered irrational).

Cynamon and Fazzari (2008), Zezza (2008), Barba and Pivetti (2009), Rajan (2010), Palley (2012), Stiglitz (2012) and van Treeck and Sturn (2012) provide extensive case studies around the increasing importance of wealth-based and debt-

financed consumption on the US economy. Moreover, Guttmann and Plihon (2010) argue that consumption expenditures in the Anglo-Saxon countries have been essentially determined by changes in asset prices or in credit rather than by changes on income.

Stockhammer (2010) adds that the change in the provision of old-age retirement (from a State-provided social security based on a "pay-as-you-go" typology to an increase prominence of private and market-based provision of pensions based on "fully funded" typology), health insurance and the financing of education with credit are also other manifestations of households' financialisation. Palley (2007) argues that the provision of these services by the private sector feeds financial interests, because they generate large profits (from charges on custodial services and brokerage commissions), increase the demand for stocks that boost share prices and create an investor identity among households that favours policies supporting financial interests. Concurrently, Becker *et al.* (2010) recognise that the introduction of "fully funded" pension systems implies the forced integration of households into the realm of financial markets and a great push towards financialisation.

Against this background, Lapavitsas (2011) adds that households have become more financialised both as debtors (mortgages, general consumption, education, health, among others) and as asset holders (housing, pensions, insurance, money market funds, among others). Van der Zwan (2014) recognises that the financialisation of households also occurs in low-income and middle-class households, feeding the idea of 'popular finance'.

In relation to the non-financial sector, Stockhammer (2010) emphasises that NFCs are more involved in financial activities, which soaks funds from real activities and hurts real investments. In addition, he stresses that "shareholder value orientation" of corporations has determined a rise of payout ratios of NFCs, which also restrains funds available for real investments.

On the other hand, Lapavitsas (2011) accepts that NFCs have reduced their reliance on bank loans, acquiring themselves financial capabilities. Baud and Durand (2012) also add that NFCs have also developed financial activities in their relationship with customers, by providing them with financial services (e.g. the development of consumption credit by retailers).

Against this backdrop, Krippner (2005) confirms that the US NFCs exhibit signs of financialisation since the 1970s, notably the growing importance of financial

revenues (interest, dividends and capital gains to investments) in comparison with the revenues generated by productive activities and real investments.

Regarding the financial sector, Stockhammer (2010) and Lucarelli (2012) admit that the financialisation process has been responsible for the emergence of a shadow banking system that is less regulated. This involved the appearance of certain institutions that do not take the form of traditional banking or insurance corporations, such as investment funds, money market funds, hedge funds, private equity funds, special purpose vehicles, among others.

Lapvitsas (2011) adds that in the era of financialisation banks have expanded their activities in financial markets to earn fees, commissions and profits from trading and they have directed the credit essentially to households. Concurrently, Lucarelli (2012) adds that commercial banks have begun to engage in financial market intermediation (as for instance, mediating mergers and acquisitions) and have expanded their operations into activities that were previously exclusively carried out by investment banks.

Palley (2007) adds that the financialisation process has also affected economic policies as a whole, promoting a policy framework based on globalisation (free trade, capital mobility, multi-national business and global sourcing), decline of government activity (privatisations, tax cuts on income and on capital that diminish public revenues and increase public deficit and public debt, deregulations and policies to introduce market mechanisms in the case of pensions and savings), abandonment of full employment goals (elevation of the importance of low inflation goal using inflation targeting policies and central bank independence), and labour market flexibility (decrease of trade unions power and erosion of labour market social supports, such as the minimum wage, employment benefits, employment protection and employees rights). He claims that this framework facilitated the expansion of financial markets and helped corporations to shift income from labour to capital, which feeds the interests of the financial sector.

These measures adopted by the international policy makers have been responsible for a fall in wages and an increase of inequality levels. In this regard, Becker *et al.* (2010) advocate that the rise of inequality on income distribution accelerates by itself the financialisation process. This happens namely because the upper middle class earns higher wages that can be invested in the financial markets and the

lower middle class are pressed to incur debts in order to maintain consumption standards and/or to acquire houses or other durable goods.

Figure 5 synthesises the main effects – appointed by the literature – of financialisation on households, NFCs, financial corporations and policy makers, respectively.

Figure 5 – Effects of financialisation on economic agents

Effects of financialisation	**Households**	Strong dependence of credit Strong indebtedness Unsustainable levels of consumption Holders of financial assets
	Non-financial corporations	Involvement in financial activities Lower retention ratios Provision of financial services
	Financial corporations	Shadow banking system Directed credit to households Commercial banks acting like investment banks
	Policy makers	Free trade Privatisations Tax cuts on income and on capital Abandonment of full employment goals Focus on inflation targeting policies Labour market flexibility

Source: Authors' representation based on Palley (2007), Stockhammer (2010), Lapavitsas (2011), among others

Moreover and following a post Keynesian macroeconomic perspective, Hein and van Treeck (2010), Hein (2012) and Hein and Dodig (2015) highlight that the financialisation process has harmful effects on households' debt and consumption, real investment, income distribution, and on net exports and current account balances. Note that the majority of these macroeconomic effects are directly related with the aforementioned effects of the financialisation process on economic agents (i.e. they are the result of the effects of financialisation on economic agents).

Regarding consumption, it is argued that the financialisation process generated increasing potential for wealth-based and debt-financed consumption, which have increased financial fragility. On one hand, stock market valuations and housing price booms favoured a rise in notional wealth against which households were willing to borrow. On the other, a change in financial norms, the appearance of new financial instruments (like credit card debt and home equity loans) and the deterioration of creditworthiness standards triggered by securitisation strategies of commercial banks, favoured the availability of credit, even to low income and low wealth households.

Obviously, these guaranteed a higher dynamism of private consumption, supporting economic growth.

Econometric studies have shown that financial wealth (fed by the financialisation process) exerts a statistically significant and a positive effect on private consumption (wealth effect on consumption), especially in those countries with a "market-based (or dominated) financial system", but also in countries with a "bank-based (or dominated) financial system". Some examples can be found in Boone *et al.* (1998), Ludvigson and Steindel (1999), Davis and Palumbo (2001), Ludwig and Sløk (2001), Mehra (2001), Edison and Sløk (2001), Boone and Girouard (2002), and Onaran *et al.* (2011).

In relation to real investment, it is stressed that the financialisation process exerts a negative impact on it due to the co-existence of a higher preference for financial investments by NFCs and strong pressures from the respective shareholders around the intensification of financial payments.

The increase of financial investments should at least guarantee a higher level of financial receipts, but they are used to fund further financial investments rather than to support real investments. The literature has presented several explanations to describe this higher engagement of NFCs in financial activities, such as the existence of shorter planning horizons (Samuel, 2000; Crotty, 2005; and Aspara *et al.*, 2014), the trend to be more concerned with current profitability than with long-term expansion (Crotty, 1990; Orhangazi, 2008a and 2008b; Hein, 2012; and Hein and Dodig, 2015), the reduction of profits in the real sector and the increase in the external funding costs since the 1980s (Crotty, 2005; Orhangazi, 2008a and 2008b; Baud and Durand, 2012; Lin and Tomaskovic-Devey, 2013; and Soener, 2015), the macroeconomic uncertainty and the institutional changes at the level of corporate governance (Baud and Durand, 2012; Akkemik and Özen, 2014; and Soener, 2015), and the mimetic behaviour and the institutional transmission of knowledge and practices from other financialised NFCs and from financial executives and consultants (Soener, 2015).

The intensification of financial payments is associated with higher payout ratios, which constrain the funds available to finance real investments. The availability of funds has been even more reduced by the high levels of indebtedness of NFCs (Orhangazi, 2008a and 2008b), the existence of remuneration schemes based on the short-term evolution of stock prices (Orhangazi, 2008a and 2008b), the growing importance of institutional investors and the emergence of the paradigm of "shareholder

value orientation" (Aglietta, 2000; Lazonick and O'Sullivan, 2000; Stockhammer, 2010; and van der Zwan, 2014).

Econometric evidence supporting the existence of a disruptive relationship between the financialisation process and real investment of NFCs can be found in Stockhammer (2004a), Orhangazi (2008a and 2008b), Van Treeck (2008) and Onaran *et al.* (2011). These empirical studies derive and estimate investment functions, finding evidence that financial receipts (from financial investments) and financial payments are both detrimental to the real investment of NFCs.

With regard to income distribution, it is claimed that the financialisation process increased the inequality of both personal and functional income distribution, visible in the growing trend of top management salaries, in the fall of the labour income share, and in the rise of the profit share. The major reasons appointed for these trends have been the change in sectorial composition of the economy in favour of the financial sector, the "shareholder value orientation" of NFCs and the fall in the bargaining power of trade unions.

From an empirical view point, Assa (2012), Kus (2012), Czaplicki and Wieprzowski (2013) and Karanassou and Sala (2013) analyse econometrically the relationship between the financialisation process and personal income distribution. These studies use the traditional measure of Gini coefficient as dependent variable, concluding that the financialisation process has had a significant negative impact on equality levels.

Stockhammer (2009), Kristal (2010), Peralta and Escalonilla (2011), Dünhaupt (2013a), and Lin and Tomaskovic-Devey (2013) address empirically the relationship between the financialisation process and functional income distribution. The majority of these studies derive and estimate a labour income share, finding evidence supporting the claim that the financialisation process had a statistically significant and negative impact on labour income share.

Regarding current account balances, it is argued that the financialisation process has created problems of foreign indebtedness, speculative capital flows, exchange rate volatiles, currency crises and persistent current account deficits. At the same time, the liberalisation of international capital markets and capital accounts has allowed for rising current imbalances at the global, but also at the regional levels, in particular within the euro area (EA) countries (Hein, 2012).

Figure 6 offers a general overview regarding the main macroeconomic effects linked with the financialisation process.

Stockhammer (2010) stresses that the financialisation process has given rise to two different growth models: a "consumption-driven growth model" and an "exported-oriented growth model". Hein (2012) refer them as two types of capitalism under financialisation: the "debt-led consumption boom" and "export-led mercantilist" models, respectively.

Figure 6 – Macroeconomic effects of financialisation

Effects of financialisation	**Private consumption**	Debt-financed consumption Rise in notional wealth Higher availability of credit
	Real investment	Involvement in financial activities Lower retention ratios
	Income distribution (personal and functional)	Rise in top management salaries Decline of labour income share Increase of profit share
	Current account	Foreign indebtedness Speculative capital flows Exchange rate volatile Currency crises Persistent deficits

Source: Authors' representation based on Hein and van Treeck (2010), Hein (2012) and Hein and Dodig (2015)

The first growth model – mostly presented in Anglo-Saxon countries, US, UK and Ireland, but also in Greece and Spain, since the end of 1990s – is associated with a strong growth of credit and increasing levels of indebtedness. Dodig *et al.* (2015) add that this growth model is also present in Estonia and in South Africa. In all of these countries, a property boom allowed households to increase mortgage loans that they could not afford given their income, but that seemed reasonable to banks which assumed that housing prices would continue to increase. The effect of the property boom can be interpreted by the financial accelerator theory developed by Bernanke *et al.* (1996), which stresses that asset price inflation tends to raise collateral values, which allows more borrowing to finance consumption and investment.

Effectively, the majority of these countries developed a "credit-financed consumption boom" that boosted a fairly vigorous economic growth supported by private consumption and domestic demand. Households of these countries exhibit negative financial balances, which also translate into negative balances of the private sector (households and corporations) as a whole, despite the positive financial balances

of the corporate sector. Public sector contributes to a negative domestic financial balance. These countries have persistent deficits on the balance of goods and services and on the current account balance, since aggregate domestic expenditures supplanted national income.

Hein (2012) also adds that for the EA countries these deficits were also caused by an increase of unit labour costs and inflation accompanied by nominal appreciation of the euro, which caused a loss of competitiveness of domestic producers. For that reason, financial balances of the external sector have remained positive.

The second growth model – more useful to characterise Austria, Belgium, Germany, the Netherlands, Sweden, Japan and China since the end of 1980s – is related with the strong importance of net exports in aggregated demand, in a context where consumption and investment remained weak. These countries have experienced impressive surplus on the balance of goods and services and on the current account balance that have been partly used to finance credit bubbles of the first group of countries. In fact, these countries benefited from the world demand driven by the "debt-led consumption boom" economies. So, in these countries, financial balances of the external sector are negatives. The financial balances of households and corporate sectors are positive, whereas public sector has negative financial balances. Hein (2012) adds that these surpluses are supported by a weak domestic demand, low unit labour cost growth, low inflation and a nominal depreciation of the currency in the case of Japan.

Both growth models are susceptible to slowdown, like what happened after the collapse of the US subprime crisis in 2007. In fact, any recession of "debt-led consumption boom" economies causes a deceleration of "export-led mercantilist" economies because they are strongly dependent of the world demand and of their export markets.

Nonetheless, Hein (2012) also claims that some countries do not fit into any of the two types of models. As for instance, he notes that France, Italy and Portugal can neither be considered to have been "debt-led consumption boom" economies nor "export-led mercantilist" economies since the end of 1990s. This happens because these countries exhibit positive financial balances of households and negative financial balances of public and corporate sectors, in a context where aggregate demand was driven essentially by domestic demand. These countries could be labelled as a third growth model in the era of financialisation: the "domestic demand-led". External sector has positive financial balances in France and Portugal, but negative financial balances in

Italy. Dodig *et al.* (2015) add that Hungary, Poland and Turkey, have also a "domestic demand-led" growth model. According to these authors, Hungary, Poland and Turkey are considered "catching-up domestic demand-led countries", whereas France, Italy and Portugal are considered "mature domestic demand-led countries". This difference is related with higher growth rates of the first group of countries, probably because they have their own currencies.

Figure 7 contains the main characteristics associated with the aforementioned growth models in the era of financialisation.

Figure 7 – Growth models or types of capitalism under financialisation and the respective characteristics

Growth models or types of capitalism	**"Consumption-driven growth model" or "debt-led consumption boom"**	Growth supported by consumption Strong growth of credit Higher levels of indebtedness Property boom Deficits on external balances Households with negative financial balances Corporations with positive financial balances Public sector with negative financial balances External sector with positive financial balances
	"Export-oriented growth model" or "export-led mercantilist"	Growth supported by net exports Sluggish domestic demand Surplus on external balances Households with positive financial balances Corporations with positive financial balances Public sector with negative financial balances External sector with negative financial balances
	"Domestic demand-led" (catching-up and mature economies)	Growth supported by domestic demand Households with positive financial balances Corporations with negative financial balances Public sector with negative financial balances

Source: Authors' representation based on Stockhammer (2010) and Hein (2012)

1.6. Conclusion

For many years, the financial sector was subject to high levels of regulations and restrictions, which seemed to constrain a higher economic growth. This period was characterized by a certain level of financial repression all over the world.

However, in the last decades and especially after the beginning of 1980s, there was a strong liberalisation and deregulation of the financial sector, which occurred due to two fundamental reasons. First, conventional economic theory postulated that the financial development would be crucial to ensure a higher economic growth given its positive effect on investment. Second, this claim of mainstream economics was accompanied by the emergence of several empirical studies finding a positive relationship between financial development and economic growth.

The liberalisation and deregulation of the financial sector resulted in a huge growth of the financial system, not only in terms of deposits, loans and stock market valuations, but also of other areas related with derivatives, securitisation and shadow banking. This originated an excessive financial deepening, increasing doubts on the "finance-growth nexus" and feeding fears around the unsustainable nature of this deregulated framework.

In general terms, the concept of financialisation corresponds to the negative effects arising from this excessive financial deepening on real economy, on economic agents and on macroeconomic outcomes. This is a broad concept that encompasses several dimensions, albeit all of them offer a negative view of the growth of finance. It is argued that the emergence of financialisation occurred in the 1980s due to strong transformations related with the globalisation and the neoliberalism framework.

Despite the recognition that this phenomenon affects the majority of economies, there is a certain heterogeneity related with the process of financialisation all around the world. This heterogeneity derives from the existence of different types of financial systems ("bank-based (or dominated) financial system" and "market-based (or dominated) financial system") and growth models paved in the last decades under financialisation ("debt-led consumption boom", "export-led mercantilist" and "domestic demand-led").

The literature has paid greater attention to assess the financialisation process in the economies of the centre (more developed and more financialised), neglecting the peculiarities and dynamics of that phenomenon on smaller, less developed, less financialised and more peripheral economies (Becker *et al.*, 2010 and French *et al.*, 2011).

2. Research Question(s), Motivation(s) and Contribution(s)

This PhD thesis aims to evaluate the nature, the peculiarities and the impacts regarding the financialisation process in the Portuguese economy since the 1980s. This period coincides with two important transformations of the Portuguese economy, namely the liberalisation and deregulation of the financial sector and the concomitant intensification of integration in the European and global markets.

The inspiration for this PhD thesis emerged during my work as an Assistant Researcher at the FESSUD Project on Dinâmia'CET-IUL (Centre for Socioeconomic Change and Territorial Studies) in partnership with CES (Centre for Social Studies) – University of Coimbra.

To the best of our knowledge, there are still few studies in the literature regarding the financialisation process in the Portuguese economy in the last three decades. Hence, we aim to present a PhD thesis that could contribute to the existing literature, namely through the presentation of an exhaustive and a complete case study that try to cover all dimensions related with financialisation process. In light of this, this PhD thesis will analyse the origins, the nature and the impacts of the financialisation process in Portugal. Portugal is an interesting case study, since it does not follow a pure neo-liberal tradition, has an intermediate development level, belongs to a monetary union and shares characteristics with centre and periphery countries.

In order to fulfil this purpose, four inter-related Essays were compiled. Each one constitutes a different Chapter on this PhD thesis. We chose this strategy, instead of the conventional model of a PhD thesis, in order to collect a set of Essays that could be presented at Conferences, Seminars and Workshops during my experience as PhD Student, and in order to have a set of Essays relatively ready for publication after the conclusion of the PhD. In addition, this strategy allows us to explore different issues and methodologies around the financialisation process and its effects on the Portuguese economy.

Our four Essays should be seen as complementary to each other, since all of them (through different prisms) aim to contribute to a best knowledge of the financialisation process and its consequences on the Portuguese economy since the 1980s.

Nonetheless, each Essay could be also viewed individually, namely because each one aims to address different features and effects of that phenomenon on the Portuguese economy. As such, it is worth to refer that may be a certain repetition of concepts, ideas or arguments in the different Essays. This could probably be more notorious in the second and in the third Essays because these two Essays aim to assess the same dimension of the financialisation process, albeit from different scales (national and European).

Accordingly, the first Essay aims to identify the signs of the financialisation process in the Portuguese economy, contributing to the literature in two aspects. Firstly,

it analyses the origins, the specificities and the evidences of that phenomenon in a peripheral economy. Secondly, it highlights the role of financialisation in the recent sovereign debt crisis. This Essay follows a general descriptive approach, looking to different dimensions of financialisation in order to find its role on the recent crisis.

This Essay concludes that there are several symptoms of financialisation in Portugal, which were caused by the liberalisation and the deregulation of the financial sector in the end of 1980s in the wake of the progressive integration in the European Union (EU). These developments fed the growth of the financial sector in terms of value added and employment and the emergence of several symptoms of financialisation, such as the strong indebtedness of the private sector, the involvement of NFCs in financial activities, the growth of private interests in areas previously reserved to the State, the bank's credit policy directed to non-tradable sectors, among others. This shows that the financialisation process also occurs in a smaller, more peripheral and less developed economies, such as Portugal. This Essay also finds that the financialisation process has put in evidence structural weaknesses of the Portuguese economy, which plays an important role in the emergence of the recent sovereign debt crisis.

After concluding that there are evidences of the financialisation process in Portugal, the second Essay aims to analyse a more specific issue regarding that phenomenon, namely its effects on NFCs' investment. This Essay also offers two contributions to the literature. Firstly, it centres on the behaviour of the Portuguese NFCs, whereas most studies on that topic are oriented to the behaviour of the US or the UK corporations. Secondly, it estimates a Vector Error Correction Model (VECM) to analyse the effects of the financialisation process and real investment, which allows the distinction between short-term and long-term.

Hence, this Essay builds and estimates an aggregate investment function in order to describe the investment behaviour of Portuguese NFCs. We use a set of five traditional variables (profitability, debt, cost of capital, savings rate and business cycle) and two other variables connected with the financialisation process (financial receipts and financial payments). We conduct a time series econometric analysis, through the estimation of a VECM, finding evidence that the financialisation process has been detrimental to real investment, mainly through financial payments.

The third Essay conducts a panel data econometric analysis, extending the model of the second Essay to the EU countries. It also contributes to the literature in two

aspects. Firstly, it is focused on the EU countries. Secondly, it conducts a panel data econometric analysis, which allows understanding whether the harmful effects of the financialisation process are generalised and transversal to a large set of countries. This is the first paper applying a panel data econometric analysis to assess the relationship between financialisation and investment.

Note that this is the only Essay of this PhD thesis that is not exclusively focused on the Portuguese economy, albeit presenting some important findings for Portugal. The results are quite similar to the ones of the second Essay, since the financialisation process continues to exert a negative impact on real investment of the EU countries, also mainly through financial payments. This Essay also finds evidence that this negative impact is worse in the more financialised countries. This suggest that the disruptive effects of the financialisation process on real investment in Portugal could become worse in the coming years if the Portuguese economy continues to deepen its degree of financialisation.

Finally, but not the least, the fourth Essay aims to analyse the effects of the financialisation process on Portuguese functional income distribution, contributing to the literature in three aspects. First, it focuses on the Portuguese economy, whereas the most studies are oriented to the specificities of economies of the centre. Secondly, it performs a time series econometric analysis, whilst most studies on this topic conduct a panel data econometric analysis. Thirdly, it uses an Autoregressive Distribute Lag (ARDL) model, which allows the distinction between short-term and long-term effects.

Thus, this Essay builds and estimates an aggregate labour income share function. We use a set of four traditional variables (technological progress, globalisation, education and business cycle) and a set of other four variables connected with the financialisation process (financial activity, government activity, shareholder orientation and trade union density). We conduct a time series econometric analysis, through the estimation of an ARDL model, finding evidence that the financialisation process has been determinant to explain the evolution of the Portuguese labour income share, mainly through its effects on government activity and on trade union density.

3. Structure and Content of the Thesis

The remainder of the PhD thesis is organised as follows. Chapter II offers a broad picture on evidences of financialisation in Portugal since the early 1980s. The role of financialisation in the Portuguese sovereign debt crisis is also evaluated.

The effects of the financialisation process on Portuguese NFCs' investment are empirically analysed and econometrically tested in Chapter III. An equation to describe real investment is derived and estimated using a VECM.

In Chapter IV, the analysis of the financialisation process on NFCs' investment is extended and econometrically tested to the EU countries, using the Driscoll and Kraay estimator.

The effects of the financialisation process on Portuguese functional income distribution are empirically analysed and econometrically tested in Chapter V. An equation to describe the labour income share is derived and estimated using an ARDL.

Finally, Chapter VI concludes, presents several policy recommendations in order to mitigate the deleterious effects of financialisation in Portugal, indicates the main limitations of this PhD thesis and makes suggestions for further research regarding the financialisation process in Portugal.

II. Financialisation in the European Periphery and Sovereign Debt Crisis: The Portuguese Case[5]

1. Introduction

In recent years, finance has acquired great prominence in most developed economies and assumed growing dominance over the economy (e.g. Krippner, 2005 and 2011; Epstein, 2005; Palley, 2007; Orhangazi, 2008a; Davis, 2009; and Stockhammer, 2010), such that "*it is difficult to escape the impression that we live in a world of finance*" (Krippner, 2005, p. 173). This process, which according to Kus (2012) began in the US during the early 1980s following deregulatory reforms under the Reagan Administration, has been referred to as financialisation.

In light of this, an increasingly diverse body of literature has addressed the causes, patterns and consequences of financialisation. In the wake of the Great Recession, many authors suggest it has contributed to the subprime crisis and thus to exacerbating the levels of anaemic growth, unemployment, inequality and poverty that had existed before this crisis (e.g. Palley, 2007; Freeman, 2010; and Kedrosky and Stangler, 2011).

Our goal in this Essay is to study financialisation in Portugal. This case study describes the financialisation process and its connection to crisis dynamics in a country that does not follow the pure neo-liberal financialisation model observed in more developed countries (to which the literature pays greater attention); Portugal belongs to a monetary union and has an intermediate development level, sharing characteristics of both developed and peripheral countries.

We find that the strong growth of the financial sector in Portugal was preceded by liberalisation and deregulation. Other features of financialisation process that have been part of the evolution of the Portuguese economy in recent decades include the heavy indebtedness of the non-financial sector, the involvement of NFCs in financial activities, the extension of markets to new areas, banks' credit policy targeting non-tradable goods sector, and the existence of a deep economic crisis. Initially, and until the late 1990s, financialisation implied strong economic dynamics, mainly underpinned by high credit growth. However, the economy started to lose momentum at the turn of

[5] This Essay is already published in Working Paper Series of Dinâmia'CET-IUL and it was already submitted to *Journal of Economic Issues*.

the millennium and its structural weaknesses emerged clearly; later, this gave rise to the sovereign debt crisis. We argue that the financialisation process played an important role in creating the conditions that led to the Portuguese debt crisis.

The remainder of the Chapter is organised as follows. Section 2 presents a selected literature review on the concept of financialisation, its manifestations and main implications around the world. The change in the regulatory framework of the financial sector in Portugal is discussed in Section 3. Section 4 highlights the main signs of financialisation in the Portuguese economy. In Section 5, we emphasise the role of financialisation in the emergence of the Portuguese sovereign debt crisis. Finally, Section 6 concludes.

2. Financialisation and Its Consequences: A Reference to the Literature

For many years, the financial system worldwide was subject to such strict regulations and restrictions on interest rates, products, and the volume and allocation of credit that some authors talked about financial repression (Sawyer, 2014). However, a strong drive for the liberalisation and deregulation of the financial system began in the 1980s on the grounds that financial development was thought to be crucial to higher economic growth as it had a positive effect on savings and thus investment; this view was supported by both theoretical (Levine, 2005) and empirical arguments (Levine, 2005; Ang, 2008; and Arestis *et al.*, 2015). As a result, regulations were slackened, ceilings on interest rates removed, reserve requirements lowered, directed credit programmes abolished and international capital controls eliminated (Sawyer, 2014 and 2015).

The deregulation and liberalisation of the financial sector resulted in a vast growth of the financial system in relation to savings and investments, not only through deposits, loans and stock market valuation, but also derivatives, securitisation, and shadow banking (Epstein, 2005). This originated excessive financial deepening, casting doubts on the "finance-growth nexus" (Sawyer, 2014). Empirical studies confirm the decrease or even reverse in the relationship between financial development and economic growth (Kose *et al.*, 2006; Prasad *et al.*, 2007; Rousseau and Wachtel, 2011; Cecchetti and Kharroubi, 2012; Barajas *et al.*, 2013; and Dabla-Norris and Srivisal, 2013). Excessive financial deepening and its negative impacts on the economic system

has been referred to as financialisation. Although there is no single and generally accepted definition of financialisation (Krippner, 2004; and Leiva and Malinowitz, 2007), one of the broadest concepts defines it as "*[…] the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operations of the economy and its governing institutions, both at the national and international level*" (Epstein, 2001, p. 1).

Besides the simple quantitative growth of finance, financialisation encompasses other diverse phenomena: higher profit accumulation of financial activities and financial corporations compared with other activities and NFCs, respectively (Epstein, 2005; Krippner, 2005; and Stockhammer, 2010); "shareholder value orientation", greater use of financial products (credit, insurance, fully funded pension funds, among others) by individuals, increasing international capital mobility (Stockhammer, 2010); financial interests dominating over economic, social, environmental and political interests (Blackburn, 2006; Crotty, 2007; Fine, 2010; and Vercelli, 2013) with the encroachment of finance into the realms of everyday life (van der Zwan, 2014).

Following Fine (2011), the FESSUD (2011) discusses the following features of financialisation: development and proliferation of financial markets; deregulation of the financial system and of the economy in general; the emergence of new financial instruments, services, institutions and markets (for example, the growth of the shadow banking system and securitisation - Stockhammer, 2010); the dominance of finance over other industries in the areas of investment, production and employment; significant growth of consumption supported by the increase in household debt; the diffusion of market and financial logics in economic and social areas previously unaffected by these logics; and a culture oriented to individualism, self-interest, rationalism and market values.

More recently, the "pessimistic view" of the role of finance within the financialisation concept has gained momentum in the wake of successive international financial crises; indeed, some authors have argued that financialisation contributed to the subprime crisis in the US in 2007 and to the Great Recession in Europe in 2008-2009 (Freeman, 2010; Stockhammer, 2010; Kedrosky and Stangler, 2011; Hein, 2012; and Tomaskovic-Devey *et al.*, 2015).

In this context, many authors have drawn attention to the negative effects of financialisation and they have been summarised by FESSUD (2011) as follows. Firstly, it reduces the level and efficacy of real investment as funds are diverted to financial

activities (including NFCs that become increasingly involved in financial activities - Crotty, 2005; and Krippner, 2005); this results in the decoupling of the financial sector from the non-financial sector (Menkhoff and Tolksdorf, 2001) and slower economic growth. Secondly, corporations normally seek to maximise their short-term financial value, overlooking their long-run survival and other social values. Thirdly, economic and social public policies are pushed into accepting market mechanisms in all areas of economic and social life, sometimes with deleterious consequences in terms of efficiency and equity. There is a rise in income inequality due to market mechanisms, public policies, and wage stagnation. Assa (2012) and Kus (2012) state that financialisation has had negative consequences on income equality, growth and employment in OECD countries. Fourthly, growing areas of economic and social life are exposed to volatility and crises, which often characterise financial markets. In general, there is greater vulnerability to debt-inflation episodes (Palley, 2007) and financial crises (Stockhammer, 2010; Freeman, 2010; and Sawyer, 2014).

Although financialisation is more developed in the US and UK economies (Fine, 2011; Palley, 2007; and French *et al.*, 2011), it is present in most economies albeit with some heterogeneity in time and space (Power *et al.*, 2003; Jayadev and Epstein, 2007; Leiva and Malinowitz, 2007; Palley, 2007; Orhangazi, 2008; Sawyer, 2013 and 2015; and Vercelli, 2013). This heterogeneity may be related with the dichotomy between "bank-based (or dominated) financial system" and "market-based (or dominated) financial system" (Sawyer, 2014). Nevertheless, both types of financial system support financialisation (Sawyer, 2015).

Stockhammer (2010) and Hein (2012) confirm that financialisation is not homogenous across countries and propose classifying long-run development patterns in the financialisation era into three types of development path: the "debt-led consumption boom"; "domestic demand-led" development; and "export-led mercantilist" development.

While differences are found in the financialisation of core countries, its dynamics on the periphery are even more dissimilar. Although this aspect is often neglected (Becker *et al.*, 2010; and French *et al.*, 2011), there are a few studies analysing the specificities of financialisation in peripheral economies. Yeldan (2000) concludes that the financialisation process has negatively impacted economic growth, unemployment and income distribution in Turkey. Leiva and Malinowitz (2007) suggest that it has worsened the real economic performance of Southern (developing)

economies as well as those in the North (developed), namely implying weak growth rates and lower levels of employment due to a decline of productive investments. Similarly, Becker *et al.* (2010) focus on financialisation in two Latin American (Brazil and Chile) and two Eastern Europe (Serbia and Slovakia) countries, finding that this phenomenon has been extremely crisis-prone in all four cases.

In an analysis of the changes in the financial systems of Southern European economies in the last 15 years, Orsi and Solari (2010) conclude that they are "bank-based (or dominated) financial system" and that the banks control credit, the stock exchange and investment in shares by acting as advisers, mediators, issuers, treasurers and investors. The authors claim that universal banks in these countries are able to decide who can invest, where to invest, and who makes a profit. They also consider that the great importance of banks is the most evident sign of financialisation in these economies as they sustain the dynamism of the economy by granting high levels of credit, especially for durable goods.

In what follows, we discuss evidence and specificities of the financialisation process in the Portuguese case by looking at the points underlined by the literature: the long-run development model, deregulation of financial markets and institutions, relevance of bank credit versus financial markets, increase in financial sector profits and assets and the emergence of new financial institutions, involvement of NFCs in financial activities, expansion of market mechanisms across society and the role of public policies, and the importance of financialisation in creating crisis dynamics.

3. The Change in the Regulatory Framework: Creating the Conditions for Financialisation

The development of the Portuguese financial system occurred later than in other EU countries, mainly due to the nationalisation of the banking system in the aftermath of the 25th April 1974 Carnation Revolution[6] and the two agreements established with the IMF in 1977 and 1983. After the 1974 Revolution a socialist-oriented policy was adopted and in 1974 and 1975 governments announced the nationalisation of banking activity in order to prevent capital flight and to control the development of the economy. The issuer banks (*Banco de Portugal*, *Banco Nacional Ultramarino* and *Banco de*

[6] Revolution that ended a dictatorship of almost 50 years and instituted a democracy in Portugal.

Angola) were nationalised in September 1974 and the other financial institutions (including the non-monetary) in March 1975. Insurance corporations were also nationalised. In 1976, the irreversibility of the nationalisations and the prohibition of banking activity by private agents were enshrined in the new Portuguese Constitution.

In the early 1980s, most of the banks were State-owned as a result of the nationalisation process and only mutual and cooperative institutions (*Caixas Económicas* and *Crédito Agrícola*) and foreign banks (*Crédit Franco-Portugais* from *Crédit Lyonnais, Bank of London & South America* from *Lloyds Bank* and *Banco do Brasil*) remained beyond direct State control. Nationalisation were extended also to the non-financial sector, and so the State-owned corporation sector (financial and non-financial) rose considerably, increasing its importance on the gross value added, gross fixed capital formation and employment (Table 1).

Table 1 – The weight of State-owned corporation sector (% of total)

Sector	Gross Value Added		Gross Fixed Capital Formation		Employment	
	1979	**1982**	**1979**	**1982**	**1979**	**1982**
Banking	5,1	6,7	0,5	2,7	1,2	1,4
Insurance	0,5	0,7	0,4	0,7	0,3	0,3
Total	21,3	24,2	28,9	38,2	7,6	7,9

Source: Authors' representation based on Lopes (2004)

By 1991, the State-owned banks accounted for nearly 75% of the assets of the banking system (Antão *et al.*, 2009), which came under the direct control of the government, and banks activities were subject to restrictive regulations, namely on interest rates and the amount of credit. The financial system was essentially repressed, characterised by weak levels of competition, innovation and efficiency (Caixa Geral de Depósitos, 2010).

The nationalisation of banks and a socialist-oriented policy led to substantial capital flight, including foreign direct investment. This together with disruptions in production (related to labour unrest), real appreciation in the exchange rate (partially associated with real wage increases), and weak external demand contributed to difficulties in the balance of payments and the budget balance, ultimately leading to the need for external financial aid in 1977 and 1983. These two agreements also slowed the development of the financial system as they attempted to correct external imbalances by imposing measures to contain the growth of domestic demand and money supply. These

measures included credit limits, administrative control of interest rates, and limitations on the number and location of branches.

In 1986, Portugal joined the EU and started integration in the European Single Market, which required the gradual dismantling of the constraints on the financial system, particularly that of State ownership of banks and insurance corporations. Even though the elimination of restraints had already begun in 1983 with banking and insurance activities again opened to national and international private corporations, a new set of liberalising measures were adopted in the late 1980s that included the progressive elimination of administrative limits on interest rates, credit growth, the number and location of bank branches, and compulsory investment in national public debt (Castro, 2007) (Table 2).

Table 2 – Main measures of financial liberalisation and deregulation adopted in Portugal

Date	Measure
February 1984	Start of the removal of barriers to the entry of new banking institutions and the removal of restrictions on the expansion of the network of bank branches
June 1984	Liberalisation of deposit rates, excluding the rate on deposits with a maturity of 180 days up to 1 year
August 1985	Liberalisation of lending rates, excluding those on operations with a maturity of 90 up to 180 days, 2 up to 5 years and over 5 years, for which a ceiling was set
1986	Start of the removal of capital controls (Foreign Direct Investment and portfolio investment)
September 1988	Liberalisation of lending interest rates, excluding those related to loans for house purchase
March 1989	The reprivatisation process begins and the ceilings on all lending rates are removed
1990	New regulatory framework for Bank of Portugal
October 1990	Crawling-peg exchange rate regime ends
January 1991	Elimination of restrictions on credit, replaced by open market operations and reserve requirements
April 1992	*Escudo* joins to the European Monetary System
May 1992	Liberalisation of all deposit interest rates
December 1992	Conclusion of the process international capital movements liberalisation

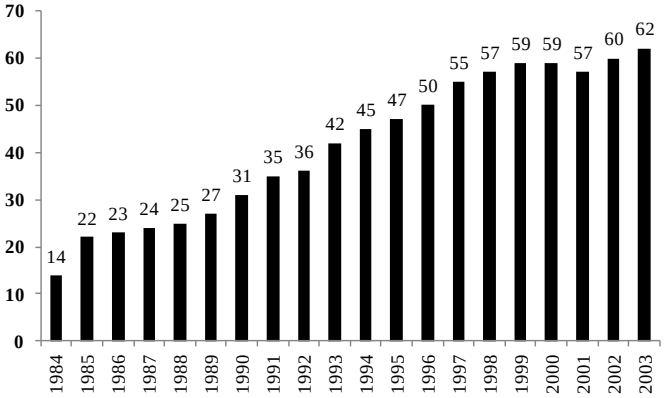
Source: Authors' representation based on Castro (2007)

The latter element was important as it allowed banks to disinvest in public debt and free resources to finance the private sector. As an alternative, the State gradually increased the sale of bonds to foreign investors (in 2008 they owned 78% of public debt), but this made it more vulnerable to capital flights as we will see below when discussing the crisis.

Consequently, a significant number of foreign banks opened activity in Portugal from the mid-1980s onwards, but they still accounted for a relatively small share of the domestic market. These foreign banks were important to the modernization and development of the Portuguese financial system, contributing to increase efficiency and innovation. Nonetheless, the foreign banks, traditionally focusing on retail banking,

continued to account for a relatively small share of the domestic market, being unsuccessful in the first years due to high levels of non-performing loans (Honohan, 1999). Concurrently, new domestic banks were created and the number of domestic and foreign banks increased considerably from the mid-1980s (Figure 8), with the number of branches more than doubling. Effectively and according to Bank of Portugal (1997 and 2000), whereas Portugal had 22 banks in 1985, this had risen to 62 in 2003.

Figure 8 – Number of banks operating in Portugal



Source: Bank of Portugal (1997 and 2000)

In 1989, amendments to the Constitution abolished the principle of the irreversibility of nationalisations, allowing the re-privatisation of banks to begin (Table 3). By the end of this process in 1996, *Caixa Geral de Depósitos* was the only bank that remained Stated-owned, with around 20% of the assets of the banking system, a share it still held in 2013 (Figure 9).

The re-privatisation of banks was an important milestone in the evolution of the financial system, enhancing competition and innovation. Both banks and other public corporations were re-privatised mainly through public offers to promote "popular capitalism", thus contributing to the development of the stock market. Commercial banks profited from this process by giving credit to small investors wishing to buy stocks, whereas investment banks gained by advising the government on the re-privatisation operations.

Subsequently and especially after 1994, the increased competition from foreign banks and rationalisation efforts gave rise to several waves of bank takeovers that increased market concentration. Either by mergers and acquisitions or by internal growth, the re-privatisation process boosted the formation of large financial groups, consolidating the dominance of five of these (*Caixa Geral de Depósitos*, *Banco*

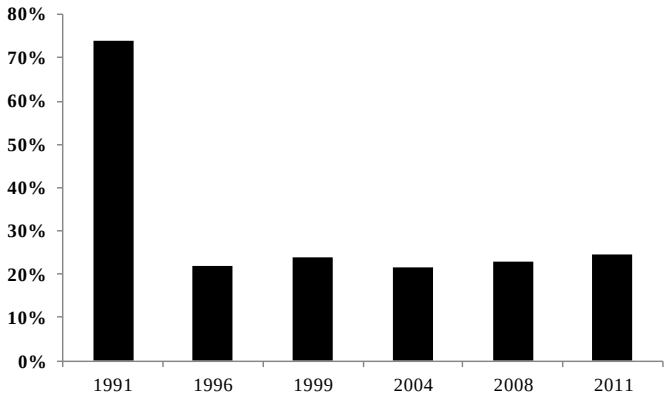
Comercial Português, *Banco Espírito Santo*, *Banco Pinto & Sotto Mayor* (latter *Banco Santander Totta*) and *Banco Português do Investimento*). Since 1996, these five banking groups have controlled around 80% of the banking system in terms of assets, credit, resources and profits (Figure 10).

Table 3 – Re-privatisations in the Portuguese banking sector

Bank		Date
Banco Totta & Açores	**1st Phase**	22nd March 1989 and 10th July 1989
	2nd Phase	31st July 1990
	3rd Phase	19th November 1996
Banco Português do Atlântico	**1st Phase**	11th December 1990
	2nd Phase	25th May 1992
	3rd Phase	7th July 1993
	4th Phase	24th March 1995
Sociedade Financeira Portuguesa – Banco de Investimento, S.A.		6th May 1991
Banco Espírito Santo & Comercial de Lisboa	**1st Phase**	9th July 1991
	2nd Phase	25th February 1992
Banco Fonsecas & Burnay	**1st Phase**	27th August 1991
	2nd Phase	20th July 1992
Banco Internacional do Funchal		23rd November 1992
Crédito Predial Português		2nd December 1992
União de Bancos Portugueses	**1st Phase**	3rd February 1993
	2nd Phase	11th July 1995
Banco de Fomento e Exterior	**1st Phase**	27th December 1994
	2nd Phase	28th August 1996
	3rd Phase	7th February 1997
Banco Pinto & Sotto Mayor	**1st Phase**	16th November 1994
	2nd Phase	28th March 1995
Banco Comercial dos Açores	**1st Phase**	2nd July 1996
	2nd Phase	9th December 1996

Note: *Sociedade Financeira Portuguesa – Banco de Investimento, S.A.* changed its name to *Banco Mello, S.A.* and to *Banco Mello Investimentos, S.A.* on 26th June 1996. *União de Bancos Portugueses* changed its name to *Banco Mello Comercial, S.A.* on 28th June 1996. Source: Authors' representation based on Mendes and Rebelo (2000)

Figure 9 – The importance of public banks in the Portuguese banking system (% of total)

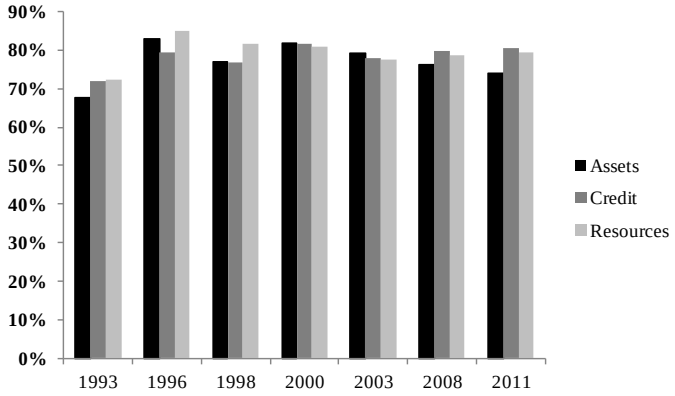


Source: Bank of Portugal, *Associação Portuguesa de Bancos* and Antão *et al. (*2009)

The adoption and inspiration of European law contributed decisively to the liberalisation and deregulation of the Portuguese financial system: the new Organic Law

of the Central Bank (in 1990)[7], transposition of the Second Banking Coordination Directive to the Portuguese law (in 1992)[8], and implementation of the EU Capital Adequacy Directive (between 1990 and 1993)[9]. From 1989 to 1994, the reduction in the legal requirement for reserves to the European level (2%) also allowed banks to easily extend credit supply at low interest rates.

Figure 10 – The importance of five largest banks (% of total)



Note: Non-consolidated data from 1993 to 1998 and consolidated data from 2000. Source: Bank of Portugal's Annual Reports (from 1993 to 2003) and own calculations based on *Associação Portuguesa de Bancos* and Bank of Portugal (from 2004)

This new regulatory framework also established the principle of universal banking, eliminating the legal imposition of the segmentation of banking activities (commercial, savings and investment banks). Banks also started to offer other specialised products that were not strictly banking products, such as *factoring* or *leasing*. Moreover, banks seized the opportunity to start internationalising, by opening branches in other countries.

Despite the liberalisation process, no financial crisis occurred for two decades in Portugal, contrary to what happened in other OECD countries (Kaminsky and Reinhart,

[7] This new law aims to strength the role of authorities' supervision in the Portuguese financial system.

[8] This extended the Single Market to financial services. A financial institution allowed to operate in any member state could establish new branches and provide financial services across borders throughout the EU, obtaining the so-called "EU-passport". Any bank based in the EU obtained automatic access to a much wider market, broadening the relevant market in geographic terms, reducing national borders, and removing restrictions on the range of financial activities allowed (with exception of insurance activity, where "EU-passport" was only allowed in 1976).

[9] This established uniform capital requirements for both banks and non-bank securities corporations, following the recommendation of the 1988 Basel Committee.

1999). The only events were the default of two small local banks (*Caixa Económica Faialense* and *Caixa Económica Açoreana*), with no systemic impact.

In the first six years of EU membership, Portugal's GDP per capita (in purchasing power parity rapidly converged with the EU15 average, from 54% in 1986 to 68% in 1992. The economic dynamism until 1992 was partially explained by the faster growth of credit, to which the liberalisation of the banking system had contributed. GDP growth was also boosted by political stability and accession to the EU (which favoured by the substantial transfer of structural funds), access to loans from the European Investment Bank and significant inflows of Foreign Direct Investment.

From the mid-1980s and particularly after 1990, Portuguese economic policy was committed to the nominal convergence strategy that was inherent to the process of monetary integration in the EU. The Portuguese government implemented a strategy of "competitive disinflation", characterised by restrictive monetary policy, anchoring of the exchange rate to the Mark, and fiscal policies aimed at reducing the external deficit and inflation (the so-called "exchange rate peg" policy). This policy strategy, especially the high real appreciation of the currency, and the crisis of the European Monetary System in 1992-1993 led to a recession that interrupted the catching-up process. The non-tradable goods sector was particularly affected by the exchange rate peg, because its selling prices went down to international standards but it took some time for costs (namely wages) to follow.

However, the 1993 recession was rapidly overcome, and in the remainder of the 20th century the Portuguese economy benefited from the improved performance of the international economy and the sharp reduction in real interest rates from the mid-1990s, which rapidly increased consumption and investment. The drop in interest rates was the result of the aforementioned "nominal convergence" (in anticipation of the EA), the liberalisation of the banking sector, and the free movement of capital within the European single market. Banks ensured the financing of the economy, borrowing money internationally and lending it internally. Portugal had a strong economic dynamism, particularly until the late 1990s, with the country converging in real terms with Europe and maintaining the public deficit under control. This dynamism was despite Portugal having the highest exchange rate appreciation of the (future) EA countries between 1994 and 1998, due to the maintenance of a peg to the Mark in the face of larger inflation rates than in Europe. Given the high economic growth between 1995 and 2000 (4.3% annually) and the scenario of low interest rates, the public deficit

was controlled and levels of indebtedness looked relatively sustainable and, therefore, did not seem to pose a significant risk to the economy.

The good economic performance was also the result of the positive momentum of the international economy, low oil prices, favourable exchange rate developments (with the dollar appreciating against the euro) and the rise in social expenditures and public investment in the welfare state. The expansionary fiscal policy was also visible through the high level of construction of new infrastructures (namely roads and motorways) largely thanks to the EU structural funds (Abreu, 2006).

4. Evidence of Financialisation in Portugal

The liberalisation, deregulation and integration in the EU of the Portuguese economy created conditions for the financial sector to grow. In this section, we will examine to what extent the Portuguese economy exhibits symptoms of financialisation by analysing the indebtedness of the private sector, the financial sector's growth, the increase in financial assets, the engagement of NFCs in financial activities, the evolution of credit by sector, the broadening of market interests to other areas of the economy and the orientation of public policy towards the interest of the financial sector.

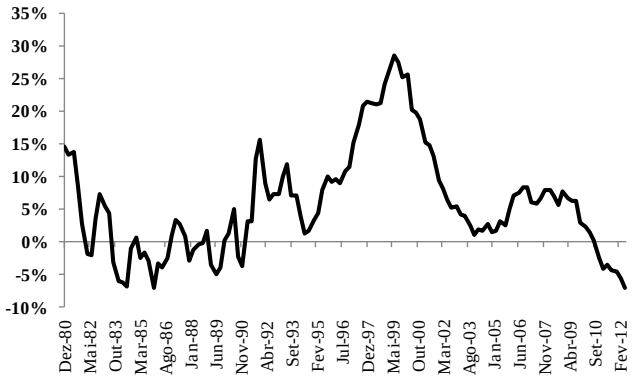
4.1. Indebtedness of the Private Non-Financial Sector and Growth of the Financial Sector

In the early 2000s, Portuguese households and corporations were among the most indebted of the EA. During the 1980s, the real growth of credit (obtained from the difference between the nominal growth and the inflation rate) was very low and even negative in some years (Figure 11) as a result of slow economic growth, nominal instability and also the IMF intervention. A cycle of strong growth in credit started in 1995 and reached more than 25% per year in 1999. This growth was associated with the European integration process, which affected both the demand and supply of credit.

On the demand side, the participation in the EA increased current and expected output, lowered unemployment and led to a sharp decline in nominal and real interest rates. Initially, economic agents saw these changes as permanent, fostering a substantial rise in credit demand.

On the supply side, greater competition between banks also increased the availability, sophistication and diversification of financial products, particularly in the credit segment. The greater availability of credit was made possible by the domestic banks' easier access to international financial markets, which occurred even before the arrival of the euro due to the elimination of capital controls and a marked reduction in exchange rate risk. After Portugal joined the euro, the exchange risk virtually disappeared and the access to European financial markets became even easier. Portuguese banks could diversify their funding sources by selling government bonds from their portfolios and borrowing on the euro interbank and bond markets, or from the European Central Bank (ECB), making them less dependent on deposits that were going down. Moreover, the increased use of loans' securitisation also facilitated banks' financing and became an important funding source. Accordingly, securitisation corporations and funds started in 2001 and grew exponentially, representing 62% of the assets of all Other Financial Institutions in 2011.

Figure 11 – Total loans (annual real growth rate)

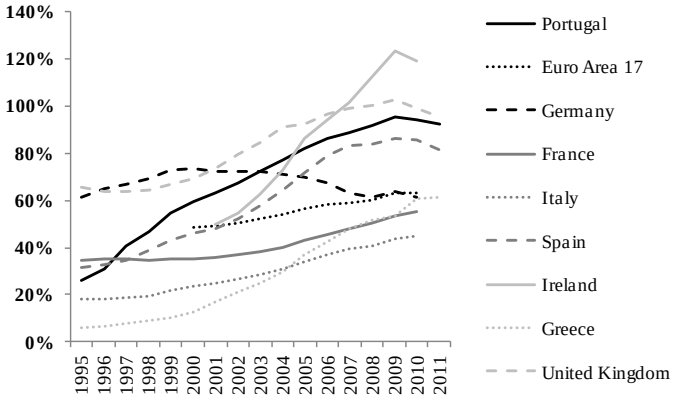


Note: Excluding financial non-monetary institutions and securitised credit. Source: Bank of Portugal

In this context, the easier financing allowed banks to satisfy the demand for credit, feeding the increase in household and corporative indebtedness (Figure 12 and Figure 13). The high levels of household debt are essentially explained by the rise in mortgages from the early 1990s; house ownership boomed in Portugal, with around two-thirds of householders owning their home and 20% having a second house. House ownership was fostered by a malfunctioning rental market, the existence of subsidised mortgages by the government until September 2002, and fiscal benefits for savings designed to buy a house. Housing credit represented around 80% of total credit to households in 2011, with the remainder for consumption and other purposes. In relation

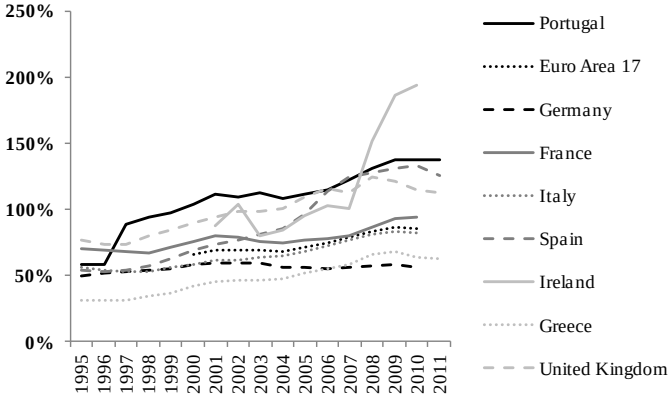
to NFCS, medium and long-term credit to finance investment was the segment that exhibited largest growth. The high level of NFCs' debt is consistent with the argument that corporations in a financialised environment are faced with pressures to raise the equity rate of return in the short-term and thus resort to increasing leverage (Palley, 2007).

Figure 12 – Households' debt (% of GDP)



Source: Eurostat

Figure 13 – Corporations' debt (% of GDP)



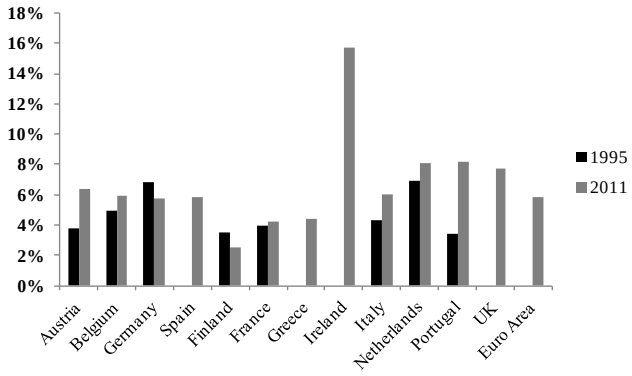
Note: Debt includes loans, securities other than shares and trade credit. Source: Eurostat

In sum, the strong growth of household and NFCs indebtedness from 1995 is a sign of the financialisation of the Portuguese economy. Another trend observed is the increase in the shadow banking system through the growing use of securitisation (Stockhammer, 2010).

The growth of bank credit fed the growth of the financial sector, which can be interpreted as a symptom of financialisation. From 1995 to 2011, the gross value added in the financial sector also rose considerably from 3.4% of total gross value added in

1995 to 8.1% in 2011 (Figure 14). In 1995 the Portuguese financial sector was one of the smallest in the EA in terms of value added, but its rapid growth between 1995 and 2011 meant it was higher in Portugal than the EA average.

Figure 14 – The importance of the financial sector (% of gross value added of total economy)



Note: The values for the EA reflect the "changing composition". Source: Eurostat

The rapid growth of credit created profit opportunities for banks. Before the 2008 financial crisis, the average Return on Assets (ROA) of Portuguese banks was one of the largest in the EA. For instance, the average ROA of Portuguese banks in 2005 and 2006 was 0.93% and the unweighted average ROA of the EA12 was 0.69% (ECB, 2007).

Krippner (2005) claims that the financialisation of the economy is accompanied by a growing proportion of the economy's profits coming from financial corporations. This is confirmed by the fact that the financial sector's contribution to the surplus of the economy grew more than that of the non-financial sector from 1995: the gross operating surplus of financial corporations in relation to the gross operating surplus of NFCs increased from 14% in 1995 to 26% in 2008, which was followed by a decline to 19% in 2011[10]. As gross operating surplus includes the remuneration of capital (rents, interests and profits), this evolution means that a larger share of the remuneration from capital was from the financial sector.

The growth of banking credit created two fragilities in the Portuguese financial system. Between 1997 and 2010 there was a sharp decline in banks' capital adequacy ratios, which in 2010 were among the lowest of the EA11. In 2010, the ratio of the Portuguese banking system was 10.3% compared with 13.6% in the EA11 (data from

[10] The values for 2010 and 2011 are forecasts. These data were obtained from the Portuguese National Accounts available at *Instituto Nacional de Estatística*.

ECB Statistics on consolidated banking data). Additionally, because the growth of credit was not accompanied by that of deposits due to the decline in internal savings, the loans-to-deposits ratio rose sharply from 57% in 1989 to 172% in 2008, making banks over-dependent on market financing (data from Bank of Portugal).

Another weakness of the banking system resulting from the recent evolution was the heavy concentration of loans in the real estate sector (households, construction and real estate corporations): the weight of these loans in total loans to the private non-financial sector went up from 17% in 1980 to 59% in 2008. For the purposes of comparison, in 2008 the weight of residential real estate as a proportion of total loans (including to government and non-residents) was much larger in Portugal (32%) than in Austria, Germany, Italy and the Netherlands (18%)[11]. The importance of credit to the real estate sector exposes banks to a fall in real estate prices. Notwithstanding, Portugal did not experience a boom and bust cycle in the housing market (See Section 5.2.).

Table 4 – Financial assets of the economy (% of GDP)

Country	1995	2000	2010	Change 1995-2000 (p.p.)	Change 2000-2010 (p.p.)
EA17	n.a	418%	563%	n.a.	145
Belgium	218%	350%	480%	262	130
Germany	474%	670%	722%	249	52
Ireland	n.a.	n.a	2389%	n.a.	1284
Greece	57%	59%	105%	48	47
Spain	353%	467%	586%	232	119
France	88%	177%	272%	184	95
Italy	51%	105%	116%	65	11
Netherlands	847%	1091%	1447%	600	357
Austria	384%	469%	633%	249	165
Portugal	**445%**	**579%**	**719%**	**274**	**140**
Finland	316%	403%	684%	369	282

Note: Consolidated figures. The change for Ireland corresponds to the period between 2001 and 2010.
Source: Eurostat (Annual Sector Accounts)

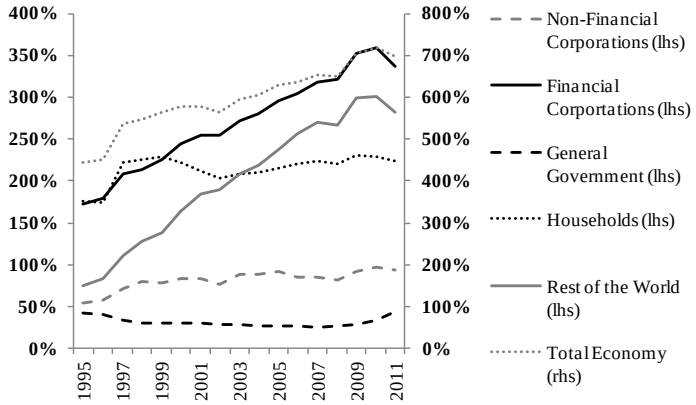
Another perspective on financialisation is given by assessing financial assets[12] in the economy and their distribution across financial sectors. Cingolani (2013) claims that an upward trend in financial assets indicates the relative speed at which financial stocks and productive revenues develop over time and, therefore, indirectly measures the accumulation of "financial rents". In Portugal, financial assets accounted for around

[11] This is based on IMF Financial Soundness Indicators; for Italy we used 2011 data and for Germany 2007 data.

[12] According to Eurostat, financial assets include currency and deposits, securities and other shares, loans, shares and other equity, insurance technical reserves and other instruments receivable/payable.

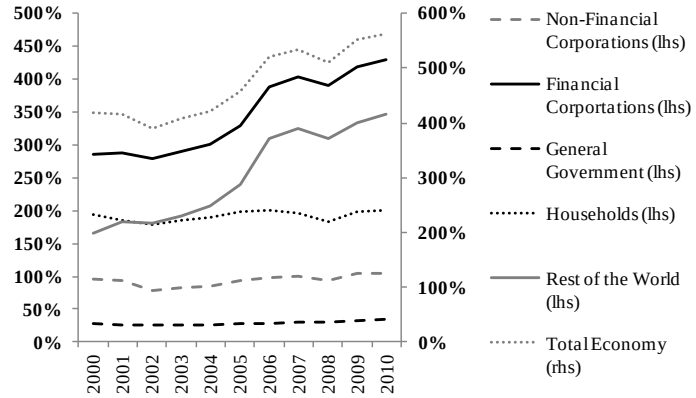
719% of GDP in 2010, which is the third highest value in the EA11. On the other, the growth of financial assets in Portugal in 1995-2000 was quite considerable (Table 4).

Figure 15 – Financial assets by institutional sector in Portugal (% of GDP)



Note: Non-cumulative and consolidated figures. Households include non-profit institutions. Source: Eurostat (Annual Sector Accounts)

Figure 16 – Financial assets by institutional sector in the EA17 (% of GDP)



Note: Non-cumulative and consolidated figures. Households include non-profit institutions. Source: Eurostat (Annual Sector Accounts)

Meanwhile, like in EA17, most of the financial assets in Portugal were owned by financial corporations (including the central bank, banks and other non-monetary financial institutions). From 1995 to 2011, there was a rapid rise in financial assets held by financial corporations. In 1995, financial assets owned by households and financial corporations each represented around 175% of GDP but in 2011, financial corporations basically doubled their assets to 337% of GDP while those of households increased only to 224% of GDP. The latter increase occurred between 1995 and 1997 and then basically stagnated until 2011; this is consistent with the drop in savings and the rise in household indebtedness. Note that the growth of financial corporations' assets led to

Portugal's convergence with the EA in terms of distribution of assets by institutional sector (Figure 15 and Figure 16). The rapid growth of financial assets held by financial corporations may reflect a transfer of wealth from the productive sector and households to the financial sector (Cingolani, 2013). Within the financial sector, banks were largely responsible for the growth of financial assets together with other credit institutions and credit securitisation corporations and funds. Loans were the banks' fastest growing financial assets, in line with the above-mentioned rise in credit to households and NFCs.

In the same period, "the rest of the world" registered an even larger growth in the holdings of financial assets. This is a consequence of the high current account deficit, which was financed by transferring assets to foreign investors.

4.2. Financial Engagement of Non-Financial Corporations

It should also be noted that financial assets owned by NFCs rose by 42.4 p.p. in Portugal from 1995 to 2010 (Figure 15). Although the increase in the importance of these assets from 2000 was a little bigger in Portugal than in the EA17, in 2010 NFCs owned slightly fewer financial assets in Portugal than in the EA17 (Figure 15 and Figure 16). As NFCs should not accumulate financial assets, a large increase in the financial assets owned by those corporations indicates that they are diverting resources from productive applications to financial accumulation, distorting their main goal.

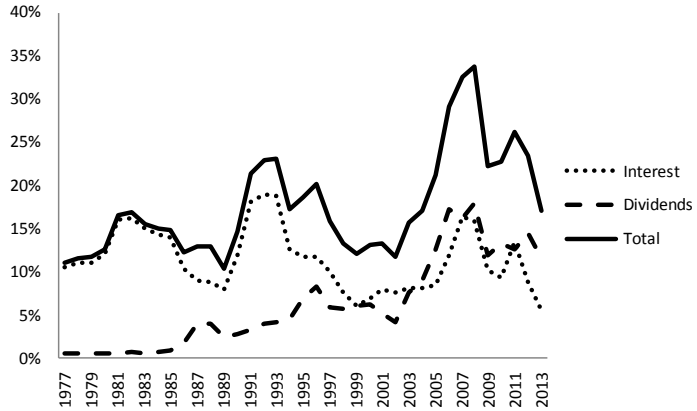
Indeed, financialisation implies that NFCs become increasingly involved in financial activities and, thus, their financial profits grow more than the profits from productive activities, with a diversion of resources from real investment (Krippner, 2005). On the other hand, financial markets demand more payments from NFCs, therefore reducing the capacity to finance real investment through retaining earnings. Note that the latter effect may be linked to an increase in indebtedness that increases corporations' interest payments.

Regarding the first effect, total financial receipts as a percentage of gross operating surplus had an overall positive trend in Portugal, despite some oscillation (Figure 17). The main increase was between 2003 and 2008. Looking at the components of financial receipts (interest and dividends), we observe that only dividends had a clearly positive trend from the mid-1980s.

As for the second effect, there was a decline in financial payments as a proportion of gross operating surplus until 2003 due to the fall in interest paid caused by the large cut in interest rates; but there was an upward trend in financial payments

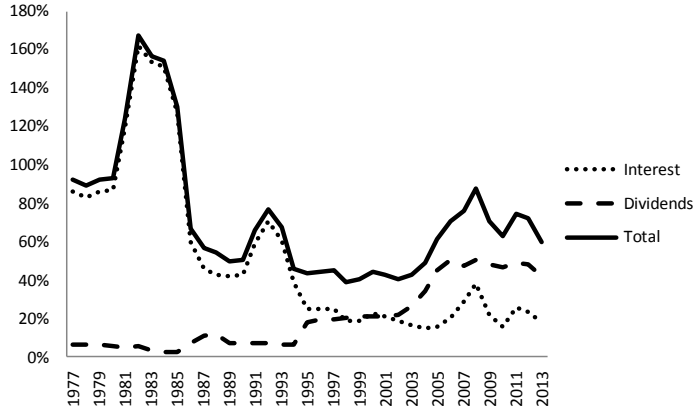
between 2004 and 2008 followed by a slightly downward trend thereafter (Figure 18). Analysing the components of financial payments, the rise in interest paid from 2006 to 2008 is explained by the increase in interest rates in the period; this clearly illustrates the risks associated with interest rate rises in a context marked by high corporate debt ratios. On the other hand, there was a moderate rise in dividends paid from the mid-1990s, followed by more rapid growth in the mid-2000s before stabilising thereafter.

Figure 17 – Receipts of NFCs (% of gross operating surplus of NFCs)



Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Figure 18 – Payments of NFCs (% of gross operating surplus of NFCs)



Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Importantly financial payments were, as expected, larger than financial receipts. Moreover, the rise in payments to financial actors between 2003 and 2008 and in financial receipts between 2004 and 2008 may have contributed to the observed downward trend in NFCs investment in that period. High indebtedness is another factor that may have contributed to the decline in NFCs investment levels from 2001.

4.3. Sectorial Distribution of Credit across Industries

Although banks increased credit to NFCs and households, they increased the financing to non-monetary financial institutions even more. Credit to non-monetary financial institutions in proportion of the credit to NFCs jumped from 2.1% in 1980-89 to 21.7% in 1990-99, and rose to 24.1% in 2000-10 (data from Bank of Portugal). This shows the financial system was steadily decoupling from the non-financial sector.

Another element worth underlining is that the growth of credit to NFCs was quite heterogeneous across industries. An analysis of the growth of credit by industry (Table 5) in 1993-2007 clearly shows that the banking system gave more credit to construction, real estate and other non-tradable activities than to manufacturing, even though credit to manufacturing continued to grow. Moreover, a survey on investment conducted by *Instituto Nacional de Estatística* (*Inquérito Qualitativo de Conjuntura ao Investimento)* asked corporations if they had faced credit constraints on their investments. Results show that the industries which experienced greatest difficulties in obtaining credit between 1998 and 2007 were manufacturing, construction (especially from 2004), and transportation and storage.

Table 5 – Credit by sector (average annual growth rate)

Sector	1993-1999	1999-2007	2007-2011
Agriculture	1.7%	8.5%	9.0%
Mining	3.0%	2.0%	2.8%
Manufacturing	**2.8%**	**3.5%**	**3.6%**
Utilities	1.3%	7.9%	16.9%
Construction	29.5%	14.0%	-1.1%
Trade	12.4%	4.5%	0.1%
Transport	6.0%	12.3%	5.4%
Hotels and Restaurants	69.3%	18.3%	11.9%
Information and Communication	52.6%	1.3%	10.0%
Holdings	7.5%	11.5%	4.8%
Real Estate	29.5%	16.7%	0.9%
Consultancy	14.7%	12.5%	1.2%
Education and Health	n.d.	0.3%	9.9%
All Activities	**12.8%**	**9.4%**	**2.9%**

Source: Bank of Portugal

Manufacturing's difficulty in obtaining credit may be explained by its slower output growth or by the fact that banks assessed it as a higher risk sector exposed to greater competitive pressures from abroad. The appreciation of the exchange rate during the 1990s to ensure nominal convergence with Europe, which would later allow the adoption of the euro, contributed to a decline in the tradable sector's external competition. In conjunction with the privatisation process, this created an

entrepreneurial focus on the internal market (construction, real estate, support services to corporations and households, and education and health services), heavy investment in infrastructures (telecommunications, audio-visual, gas, electricity, roads, water and environment) and the consolidation of tourism (Rodrigues and Reis, 2012). In addition, the real estate and construction sectors offer relatively safe collateral (real estate). In a financialised economy, banks tend to allocate funds to the more profitable investments in the short-term, even though they may be less desirable in the long-term (Sawyer, 2015). On the other hand, this stance may also reflect the interests of banking groups in direct investments in some non-tradable sectors, such as real estate and health.

Nevertheless, the growing importance of the non-tradable goods sector in relation to that of tradable goods and the concomitant deindustrialisation of the Portuguese economy were associated with the smaller amount of credit allocated to the tradable goods sector.

4.4. Broadening of Private Interests in the Economy, Taxes and Public Policy

Another symptom of financialisation is the penetration of private interests in areas previously reserved to the State (FESSUD, 2011). In Portugal, this was first seen due to privatisations. The large number of nationalisations that followed the 1974 Portuguese Revolution was reversed through a process of privatisations from the late 1980s. As seen above, financial corporations came in the first phase of privatisations between 1989 and 1993, followed by the NFCs; the process was at its peak in the late 1990s but still continues today.

More recently, private interests have entered new areas that were not open to corporations (even State owned ones), namely health provision, water provision, and construction and management of public infra-structures (mainly highways). For instance, the health sector has attracted the interest of private corporations and several private hospitals have opened since 1995. The largest financial groups also own clinics and hospitals and provide medical services articulated with private health insurance. Although the public health service is the main provider of medical cares to the population, the demand for private health insurance is due to the easier access and (supposed) higher quality of medical services.

In addition to the above changes in the health sector, the public sector has also started to adopt more market-oriented mechanisms. Important examples are the

establishment of public-private partnerships (PPPs) for the construction and clinical operation of new hospitals, increased autonomy of State-owned hospitals that became public corporations, and the introduction of user fees. The aim of these changes was to boost efficiency and raise more revenues for the State in the context of a National Health Service that is increasingly difficult to finance.

The PPPs were first established in the health infrastructures sectors in 2002. In the health sector, these partnerships almost always include the construction, maintenance and management of the infrastructure. The typical PPP for hospitals is led by a private corporation responsible for obtaining finance and constructing and managing the infrastructure. Banks finance the operation and the leading corporation of the partnership may also belong to a banking group. Thus, PPPs also seem to be a profitable business for banks. The State pays rent over several years to the private corporation in exchange for the construction and management of the hospital.

Teles (2015) also emphasises the concessions established through PPPs in the water provision system in Portugal, particularly after 1993 with the publication of Law N.º372/93 that allowed the participation of private capital in this sector. These partnerships have guaranteed heavy investment in the sector that improved both the coverage and quality of the service provided. The financial sector benefited from this investment due to the flows of private credit into water (and indeed other utilities like electricity, gas, and waste management), the use of derivatives and issuance of bonds (mainly by *Águas de Portugal*) and the adoption of a pricing model that minimises the project risk (total-cost recovery that transfers financial burden from corporate providers to consumers and local authorities). The construction sector also profited from this investment with the building of huge infrastructures (many of them too large for the demand). In addition, construction corporations have direct participations in the respective concessionaries and most of the operators in these concessions are owned by stock-listed construction corporations like *Mota-Engil* and *Somague*.

Today, water services provided by PPPs serve 13% of the country's population, mainly in more densely populated areas. On the other hand, municipalities have found the PPPs to be costly due to the poor distribution of risks between private corporations and municipalities, namely with respect to the evolution of demand and funding costs. Most of these PPPs overestimated demand, which led to an extension of the concession period and/or to an increase in tariffs.

PPPs are a great incentive for Governments to construct infrastructures because it delays payment to a future date. According to *Direcção-Geral do Tesouro e Finanças* (2011), a very significant amount is contracted under PPPs and accounted for around 1% of GDP a year between 2011 and 2018. Most of these contractual investments pertain to road infrastructures, followed by healthcare infrastructures, and many were characterised by a lack of transparency and accountability (Andrade and Duarte, 2011). In sum, PPPs represent a negative pressure on the fiscal budget in the medium and long-term.

The growing role of private corporations and PPPs in the health sector has other social and economic implications, notably a potential increase in social exclusion and inequality and the deviation of good professionals from the public to the private sector. Finally, the increasing penetration of markets in the health sector and others formerly in the State sphere may ultimately make people's values (Bowles, 1998) become more market-oriented, with greater emphasis on competition and less on solidarity and cooperation.

The government must raise more taxes if it is going to contradict the negative pressure the PPPs put on fiscal budget. In fact, the financial sector contributes to society through the payment of taxes. According the Portuguese Tax Authority, the effective tax rate of financial and insurance activities was larger than the national average in the period between 2007 and 2010. However, the national average was pushed down by social and other activities characterised by the high level of informality. When we restrict the comparison to manufacturing industry, real estate activities, construction or health activities, the tax rate paid by financial and insurance activities was 3 to 4 p.p. lower, which could reflect a certain benefit to this sector (Table 6). According to the *Associação Portuguesa de Bancos* (2010), lower average tax rate on profit of the financial sector is related in part with the use of the Madeira Off-shore (valid up to 2011).

The State took other significant measures to boost finance and market mechanisms: liberalisation of the banking and financial markets, fiscal incentives for households buying houses and shares in privatisations, zero taxation on capital gains on the stock market until recently, and the integration of private pension funds (with future sustainability problems) in public social security. Some of these decisions, namely the latter and the use of PPPs, did not emerge spontaneously from political parties' programmes but were aimed at solving immediate public finance problems.

Table 6 – The effective tax rate on profits by activity (%)

Activity	2007	2008	2009	2010	Mean 2007-2010
Agriculture, Forestry and Fishing	23%	24%	22%	22%	23%
Mining and Quarrying	12%	8%	22%	24%	17%
Manufacturing	23%	23%	21%	22%	22%
Electricity, Gas, Steam and Air Conditioning Supply	23%	23%	25%	23%	24%
Water Supply, Sewerage and Waste Management	25%	24%	23%	25%	24%
Construction	24%	23%	23%	22%	23%
Wholesale and Retail Trade, Repair of Motor Vehicles	19%	18%	17%	15%	17%
Transporting and Storage	12%	21%	21%	21%	19%
Accommodation and Food Services	25%	25%	23%	23%	24%
Information and Communication	24%	24%	23%	24%	24%
Financial and Insurance	**19%**	**21%**	**21%**	**16%**	**19%**
Real Estate	23%	22%	22%	23%	23%
Professional, Scientific and Technical	3%	6%	9%	6%	6%
Administrative and Support Services	12%	12%	16%	16%	14%
Public Administration and Defence	25%	25%	28%	20%	24%
Education	15%	15%	15%	15%	15%
Human Health and Social Work	23%	23%	22%	23%	23%
Arts, Entertainment and Recreation	19%	20%	17%	20%	19%
Other Services	19%	21%	20%	18%	19%
Activities of Households as Employers	0%	0%	0%	0%	0%
Activities of Extraterritorial Organisations and Bodies	0%	0%	0%	0%	0%
Average Total Activities	**18%**	**18%**	**18%**	**18%**	**18%**

Source: *Instituto Nacional de Estatística*

Portuguese financialisation is distinct from that of core countries due to the State's role as well as other significant elements: greater dependence on banks with a secondary role for capital markets - Portugal has a "bank-based (or dominated) financial system" in the typology of Sawyer (2014), large entry of foreign capital, an overvalued currency (in real terms), large external deficits, and a weak productive system (Becker *et al.*, 2010). However, the financialisation process in Portugal is hybrid because, as a member of the euro zone, it also shares characteristics of advanced economies, notably easy access to the international markets at low interest rates (Reis *et al.*, 2013).

The weakness of financial markets in Portugal has meant that financialisation has not progressed in the pension fund industry, with many private pension funds transferred to the public domain. Moreover, the State continues to own one of the largest banks in the financial system and has used it to conduct its financial policy (Barros and Modesto, 1999; and Fishman, 2010).

Portuguese financialisation also diverges from the neo-liberal model in that overall personal income inequality declined during the period of major growth in finance (1995-2009). The reinforcement of the social state in areas like health, social protection and education is a factor that contributed to reducing inequality.

5. The Role of Financialisation in the Portuguese Crisis

5.1. The Long-Run Development Pattern and the Turn of the Millennium: Structural Problems and the First Signs of Crisis

Hein (2012) classifies the long-run development patterns in the financialisation era into three types of development path: the "debt-led consumption boom"; "domestic demand-led" development; and "export-led mercantilist" development. We argue that Portuguese development is best characterised by the "debt-led consumption boom" type - rather like Ireland, Greece or Spain -, where consumption[13] is the demand component that most contributes to GDP growth and there is a steep decline in the net lending position of households[14]. This model is characterised by a period of strong economic growth fuelled by credit and, therefore, with increasing levels of indebtedness. The growth of credit is supported by large capital inflows and causes significant current account deficits. The growth of credit in other countries was accompanied by the emergence of a real estate bubble, but this was not the case in Portugal.

In line with the model's predictions, Portugal had strong economic dynamism, particularly until the late 1990s. Portugal is quite different from Spain, Greece and Ireland in that economic growth lost momentum at an earlier stage, namely in 2000, when the Portuguese economy faced structural problems that blocked its growth potential. Andrade and Duarte (2011) and Mamede (2012) note that the most relevant constraints to development were (and still are today) the low levels of education in the labour force (aggravated by underinvestment in public education during the dictatorship), the profile of economic specialisation (which is still dominated by industries with low value-added, low levels of technology and low wages that are highly exposed to competition from Eastern European and emerging economies) and its peripheral location in relation to the main European and world markets (entailing relevant cost disadvantages). Despite a significant effort to improve all these blockages through private and public investment, there was still a large distance from advanced Europe in 2000.

To add to those limitations, in the early 2000s the economy was also up against the consequences of growing competition from emerging Asian economies (in part due

[13] Household debt in Portugal is used largely to finance house purchase and not current consumption.

[14] We could also name the Portuguese model as "domestic demand-led" because in 1995-2000 there was a boom in private investment together with the explosion in private consumption.

to agreements reached by the EU in the World Trade Organisation and other forums), which had a substantial impact on a number of traditional industries that employed a significant proportion of the manufacturing work force (namely, textiles, wearing apparel, footwear, wood and paper, metal products and non-metallic mineral). Moreover, many multinational corporations (especially in the automotive and related industries) shifted their productive capacity to some of the new member states after the enlargement of the EU to the Eastern European countries in 2004 to take advantage of their lower wages, higher educational levels, and geographical proximity to the main European markets.

An additional problem was that the increase in aggregate demand in the preceding years raised the labour cost, reducing external competitiveness and originating a loss of market share in foreign markets. This is a kind of "Dutch disease", whereby the Government policy of real exchange rate appreciation and lower interest rates together with EU structural funds induced a loss of external competitiveness (Andrade and Duarte, 2011; and Cunha, 2008); however, the following factors also played a key role: the appreciation of the euro (namely in relation to the countries affected by the Asian crisis - Abreu, 2006) and Portugal´s lack of preparation for the knowledge-based economy.

The loss of market position in foreign markets and sharp increase in aggregate demand from 1995 implied large successive current account deficits; this caused high foreign indebtedness that, in turn, increased interest payments to the exterior and further augmented the current account deficit. It should be noted that the energy deficit and the persistent fall in emigrants' remittances also contributed to the increase in the current account deficit (Rodrigues and Reis, 2012). From another perspective, current account deficits accrued from a lack of savings to support investment (Higgins and Klitgaard, 2011). The reduction in interest rates led to consumption in excess of disposable income, leading to a fall in savings. Although investment felt slightly, it remained at high levels, so that domestic saving was not enough to finance domestic investment and thus foreign indebtedness rose. In addition, investment focused on non-tradable goods (namely construction and real estate) that do not contribute to the improvement of the current account and have a slow growth of productivity. Indeed, the overall marginal efficiency of investment has declined since 1986[15] and the average efficiency of capital

[15] The marginal efficiency of capital is calculated as the change in GDP at constant market prices of year T per unit of gross fixed capital formation at constant market prices of year T-5 (AMECO).

between 1999 and 2012 after the introduction of the euro fell below the EA average: 0.02 and 0.07, respectively.

The Portuguese economy also lost momentum at the turn of the millennium due to tighter ECB monetary policy following what appeared to be signs of overheating in the EA. Given the high level of private sector indebtedness, this had a significant negative impact on Portuguese domestic demand; it clearly shows that financialisation has made the Portuguese economy more vulnerable to interest rate shocks.

Together with the more restrictive monetary policy, the bursting of the 'dot.com bubble' (from March 2000 through 2001) triggered the first international economic crisis of the new millennium and was largely accountable for the Portuguese recession of 2003 and the increase in the Portuguese public deficit to 4.3% of GDP in 2001; this made Portugal the first country in the EA to break the Stability and Growth Pact's (SGP) 3% limit. Before 2001, the Government followed a pro-cyclical fiscal policy that left no room for manoeuvre for an expansionary policy when the recession appeared (Abreu, 2006). In the following years, the Portuguese authorities had to comply with SGP rules, following pro-cyclical and recessionary fiscal policies.

In this context, the growth model based on the non-tradable goods sector and internal demand reached its limit, and in 2003 a period of dismal economic growth began and a decade-long divergence in relation to Europe. With lower economic growth, debt ratios of households and corporations continued to rise considerably; these were increasingly translated into lower private consumption and investment and, consequently, even lower economic growth, rising unemployment rates and public debt ratios (which surpassed the EA average for the first time in 2006, reaching 63.9% of GDP). Thus, the first negative consequences deriving from the increasing financialisation of the Portuguese economy became evident, particularly in relation to the levels of indebtedness of economic agents.

5.2. The Subprime Crisis

At the end of 2007 and in 2008, the international economy was affected by the collapse of the subprime credit segment in the US. As a result, some segments of interbank money markets, particularly for longer maturities, dried up leading to a liquidity shortage with direct effects in the reduction in banking credit and the rise in interest rates on loans. The credit restraint hit confidence, consumption and business investment, namely the consumption of durable goods and purchase of houses, causing

the steepest downturn on record since the Great Depression. The strong trade connections between countries also facilitated the rapid cross-country propagation of the economic crisis.

Neither Europe nor Portugal had a subprime market like that of the US (Bank of Portugal, 2008) and there are therefore marked differences between the mortgage market in the US and Portugal (Bank of Portugal, 2008). First of all, the percentage of households with mortgages is substantially smaller in Portugal (30%) than the US (45%), or indeed in other European countries like the Netherlands (38%) and the UK (40%). On the other hand, Portugal has one of the lowest ratios of credit instalments-to-income in the EA (around 14%), and also exhibited a low loan-to-value ratio. Finally, households with mortgages are relatively well off (Santos *et al.*, 2015).

On the other hand, Portuguese house prices rose more modestly than in other countries like the UK, Ireland or Spain. It should be noted that nominal Portuguese house prices increased much less than the EA average between 2000 and 2011: 21.1% and 54.2%, respectively. The Bank of Portugal (2010) stresses that house prices in Portugal have evolved in line with the fundamentals. From the mid-1990s, the increase in the supply of new houses avoided a surge in house prices and a housing price bubble, and a continuous stream of banking credit for households to buy houses maintained demand and sustained prices (Reis *et al.*, 2013).

In addition, Portuguese banks had no "toxic financial products" in their portfolios so the main difficulty arising from the subprime crisis was that of obtaining funding in financial markets. The high level of mistrust between banks caused the risk premium between Euribor and T-Bills to jump and the amount of funds traded fell sharply. Nevertheless, the funding difficulties of Portuguese banks were overcome due to the State guarantee to new issues of securitised debt by banks, as well as by the large liquidity offered by the ECB at low interest rates. Additionally, the increase in the demand for deposits by households at a time of high risk aversion and aggressive marketing strategies to attract deposits helped mitigate the funding difficulties of Portuguese banks. More generally, the downward trend in the savings rate at the start of the century was reversed.

The increase in the perceived credit risk led Portuguese banks to increase credit spreads, which implied a considerable deceleration of credit (see Figure 11) and domestic demand. The difficulty in obtaining credit has increased more quickly than overall limitations to investment from 2007, becoming the third most important limiting

factor to investment in 2011 (*Instituto Nacional de Estatística, Inquérito Qualitativo de Conjuntura ao Investimento*).

5.3. The Sovereign Debt Crisis

In this context and like most international economies, the Portuguese economy slipped into a recession in the third quarter of 2008 that was unprecedented in the post-war period. However, the Portuguese economy was initially less affected by the subprime crisis than the EA, with GDP falling less than in the EA in 2009. That was due to the government's anti-cyclical response (largely explained by automatic fiscal stabilisers) in 2009 and its support of the financial sector, following the European guidelines and the Keynesian recipe. Consequently, there was a sharp rise in the fiscal deficit in 2009, exceeding that of other EA countries. However, Portugal had struggled to maintain the public deficit below 3% between 2001 and 2008 so, in 2010, it had one of the worst fiscal deficits in the EA (10.2% for Portugal and 6.4% for EA 12) and thus public debt went from close to the EA average in 2009 to considerably over that average in 2010 and 2011.

The financialisation process made the country vulnerable in many ways. Firstly, the growth of private indebtedness funded by foreign debt made it difficult to finance the country at a time of increasing risk aversion in the financial markets. Secondly, the growth of debt was not accompanied by significant economic growth. The "debt-led consumption boom" (or the "domestic demand-led") model of growth was not sustainable because it depended on a continuing rise in debt. There had been signs of agents' difficulties in coping with the levels of credit since 2008 as non-performing loans rose considerably, especially in credit to consumption and some industries. Moreover, the investment made did not lead to increased productivity as it went to the non-tradable goods sector dependent on domestic demand and with less potential for productivity growth. Thirdly, indebted households and corporations became more exposed to increases in interest rates and to fluctuations in the business cycle. Finally, but of less importance, the use of PPPs facilitated the increase in public investment that would only be paid for in the future.

The high levels of debt in the private and public sectors, which became high levels of external indebtedness for the economy, triggered doubts among international investors about the capacity of households, corporations and the State to pay their debts in a scenario of low structural economic growth. From 2007 onwards, in a global

context of greater risk aversion and aggravated by the Greek situation, the increased perception of the risk of Portuguese public debt meant that the interest rates paid by the Portuguese government and, consequently, banks began soaring and thus made the financing of the State and banks more costly.

The continuous deterioration of the Portuguese situation, especially on the bond market, was also connected to the rating agencies' downgrading of the Portuguese sovereign debt in 2010, followed inevitably by the reduction in the credit rating of most Portuguese corporations. In a few months, the Portuguese private and public debt fell to junk status, worsening funding conditions in the international financial markets.

As a result, the Portuguese government requested financial assistance from the EU, the IMF and the ECB (the so-called Troika) in April 2011. The financial assistance covered the period between 2011 and 2014 with total funding of 78 billion euros. At the end of the programme, the Portuguese State was able to obtain financing in the debt market at sustainable interest rates. In exchange for financing, Portugal agreed on a set of structural reforms to increase potential output growth, the deleveraging of the financial system and a trajectory of fiscal consolidation.

6. Conclusion

This Essay aimed to analyse the financialisation of the Portuguese economy over the last three decades. Although the growth of the financial sector came later than other EU countries, the steady integration in the EU after 1986 led to the liberalisation and deregulation of the financial system, with the formation of large banking groups and conditions that allowed the development of financialisation.

Portugal's participation in the EA not only had an impact on the liberalisation of the financial and banking market, but also resulted in the country receiving large amounts of external financing at low interest rates, due to the elimination of the exchange risk premium. If Portugal had not been in the EA, it would have been impossible to sustain such a large external deficit for so long without increasing interest rates, and ultimately there would not have been such a growth in credit. Other peripheral financialised economies outside the EA have higher interest rates (Becker *et al.*, 2010). On the negative side, the participation of Portugal in the European Exchange Rate Mechanism and in the euro implied a real appreciation of the currency that penalised the

non-tradable sector. The participation in the euro created in itself a positive shock in aggregate demand; it removed the monetary instruments (interest rate and exchange rate) and limited the use of fiscal policy to deal with the shocks faced by the economy in the 2000s, while making the financing of the State completely dependent on the financial markets (without an ECB that would act as lender of last resort).

Our first major finding is significant evidence of financialisation in Portugal, namely in the deregulation and liberalisation of the financial sector, increasing importance of the financial sector and financial assets to GDP, emergence of new financial institutions, heavy indebtedness of the private sector, larger credit growth directed towards the non-tradable goods sector, involvement of NFCs in financial activities, decrease in the efficiency of real investment, privatisation of State corporations, and finally increase in financial interests in the health-care and water provision sectors and in the construction and management of public infra-structures. However, Portuguese financialisation has marked particularities due to the country's participation in the EA, the large role played by commercial banks and limited role of financial markets, and the less neo-liberal stance of the process.

There was strong momentum in the Portuguese economy from 1995 to the turn of the millennium, particularly boosted by the greater availability of credit at lower interest rates resulting in very robust domestic demand, in accordance with a "debt-led consumption boom" growth model. Nevertheless, Portuguese economic growth started to slow down in the early 2000s due to the emergence of structural weaknesses paved in the previous two decades. Portugal was then confronted with the Great Recession, the increase in budget deficit and the greater risk aversion of international bond investors, in addition to the vulnerabilities created by the financialisation process (high levels of private and public debt financed externally and slow structural growth); the resulting rapid decline in funding conditions forced the Portuguese government, to request financial assistance from IMF, ECB and EU. In sum, our second major finding is that the Portuguese case shows that financialisation makes the economy more prone to financial crisis.

The troika imposed a demanding austerity programme with the aim of achieving "internal devaluation", increasing the potential output growth, ensuring the deleveraging of the financial system and a trajectory of fiscal consolidation. This programme triggered a strong deterioration in the Portuguese economy so that fiscal consolidation was difficult to achieve; as a result, some claim that Portugal should exit from the EA so

that it can use currency devaluation instead of wage devaluation. Economic recovery seems difficult to achieve without resolving the structural supply weaknesses in the Portuguese economy and expansionary policies at the European level to mitigate the absence of effective mechanisms that address asymmetric developments across economies.

III. Financialisation and the Portuguese Real Investment: A Supportive or Disruptive Relationship?[16]

1. Introduction

Mainstream economics advocates that the financial sector plays a crucial role in boosting the real investment of NFCs (e.g. Palley, 2007; Orhangazi, 2008a; Demir, 2009). Nonetheless, the literature on financialisation (Orhangazi, 2008a and 2008b; Hein and van Treeck, 2010; Hein, 2012; Hein and Dodig, 2015; among others) stresses two channels through which the development of finance impair real investment. Firstly, NFCs are now more engaged in financial activities due to the incentives and pressures to generate short-term profits. This diverts funds from productive activities ("crowding out" effect). Secondly, financial markets increasingly require payments to be made by NFCs, thus using up funds that could have been used to put long-term productive projects in place.

In light of this, over recent years a small body of literature has emerged testing the hypothesis that financialisation has negative effects on NFCs' investments. Most of them derive and estimate behavioural equations for investment, finding statistical evidence that this phenomenon has hampered real investment (e.g. Stockhammer, 2004a; Orhangazi, 2008a and 2008b; van Treeck, 2008; and Onaran *et al.*, 2011).

This Essay aims to evaluate the impact of financialisation on the real investment of Portuguese NFCs between 1977 and 2013, and contributes to the literature in two ways. First, it focuses on the behaviour of Portuguese NFCs, whereas most studies focus on the US or the UK. The Portuguese economy is considered to be less financialised than the US or UK economies and its main agents of financialisation are banks as opposed to financial markets. To use the terminology of Orsi and Solari (2010) and Sawyer (2013b), the Portugal has a "bank-based (or dominated) financial system" financial system in which banks are the economy's main financing agents. Second, the Essay uses a VECM to assess the relationship between financialisation and real investment, which allows a distinction to be made between the short-term and the long-term effects of financialisation.

[16] This Essay is already published in Working Paper Series of Dinâmia'CET-IUL and it was already submitted to *Journal of Post Keynesian Economics*.

Accordingly, we estimate an equation that describes the investment of NFCs; it includes traditional variables (profitability, debt, cost of capital, savings rate and output growth) and two proxies to capture the two channels of financialisation (financial receipts and financial payments of NFCs). We study an aggregate investment function to study the macroeconomic relevance of financialisation.

We identify a disruptive relationship between financialisation and real investment. The statistical evidence of the financial payment channel is more vigorous than that of the financial receipt channel, and this may be explained by the structure of the Portuguese productive system. A disruptive relationship is also identified between debt and real investment.

The remainder of the Chapter is organised as follows. Section 2 reviews the literature on the relationship between the financialisation and investment of NFCs. An investment equation is presented in Section 3 before describing the data and the econometric methodology in Section 4. Section 5 provides the main results and discussion. Finally, Section 6 concludes.

2. The Relationship between Financialisation and Real Investment

It is widely acknowledged that economic growth and employment depend on the capacity to accumulate physical capital. Mainstream economics claims that financial institutions and financial markets play a crucial role in promoting the real investment of NFCs. It is argued that the financial sector and financial markets facilitate the provision of funding (by channelling savings to borrowers through credit and other forms), increase the efficiency in resources allocation by screening and monitoring investments, reduce market imperfections, reduce transaction costs, and provide risk management services (Orhangazi, 2008a).

Palley (2007) presents several reasons why conventional economic theory supports the growing importance of finance. Firstly, finance enhances economic efficiency since financial markets help foresee future economic outcomes and allow economic agents to assemble portfolios with better combinations of returns and risk. Secondly, he refers to Friedman's (1953) argument that financial speculation or bubbles are stabilising phenomena, insofar as asset prices tend towards their fundamental levels.

Thirdly, the financial market's outcomes improve as finance grows because the rise in traded volumes increases liquidity and minimises the manipulation of market prices. Finally, the development of finance allows corporations to better identify signs from the market about when to invest: when the market price of capital is larger than its replacement cost (q Tobin larger than one), it indicates that capital is scarce and profitable investment opportunities are available.

In the same vein, Demir (2009) stresses that financial liberalisation can generate a deepening of capital markets, a reduction of agency costs, a decrease in the asymmetry of information and increased efficiency. This process could feed a transfer of domestic and foreign savings to more efficient investment projects at lower costs, contributing significantly to the dynamism of investment and economic growth.

Nevertheless, the literature on financialisation typically argues that this phenomenon has hampered the real investment of NFCs through two ways. Firstly, it is argued that financialisation implies a rise in NFCs' investment in financial assets and thus diverts funds from real activities. Secondly, strong pressures are exerted on NFCs to increase their payments to the financial markets in the form of interest, dividends and stock buybacks.

Regarding the first channel, Krippner (2005) shows that NFCs have become more engaged in financial activities, as demonstrated by the growing importance of both financial revenues and profits in proportion of revenues and profits from productive activities, respectively. Note that this behaviour is also shared by Portuguese NFCs, which have increased their financial revenues as a percentage of gross operating surplus (Figure 17). Cingolani (2013) argues that this trend reveals a greater accumulation of financial rents to the detriment of productive accumulation.

In general, corporations use available funds either to invest in real activities or to acquire financial assets. Indeed, Tobin (1965) has already noted that financial investments and real investments could be perfect substitutes. So if NFCs increase investments in financial assets, they will have fewer funds available to invest in productive projects; this gives rise to the "crowding out" of real investment since both external and internal funds are limited. It is therefore a "management's preference channel", as labelled by Hein (2012) and Hein and Dodig (2015).

A number of explanations can be provided for why the financial revenues of NFCs have increased. Firstly, Crotty (2005) suggested that the increase in NFCs' financial investments (which also take the form of buying or expanding financial

subsidiaries) was caused by pressure from shareholders to raise current profitability and thus a focus on shorter planning horizons. The short-termism of NFCs reflects the tendency to sacrifice long-term investments in order to improve short-term profits (Hein 2012; Aspara *et al.*, 2014; and Hein and Dodig, 2015). Samuel (2000) defines this focus by managers on short-term profits at the expense of long-term expansion as "managerial myopia". This attitude is encouraged by the evaluation of managers and their salaries based on short-term profitability and stock price gains (Tomaskovic-Devey *et al.*, 2015).

On the other hand, Crotty (2005) and Orhangazi (2008a and 2008b) argue that corporations may be trying to circumvent both the decrease in profits from real sector activities and the increase in the cost of external funds since the 1980s. Corporations were forced to engage in financial activities to remain economically viable (Soener, 2015). For example, in their analysis of the behaviour of US retailers, Baud and Durand (2012) conclude that their involvement in financial activities arose from the decline in profits from real activities due to the maturation of markets, stricter regulations, sluggish demand growth and increasing competition. According to Crotty (2005), this behaviour is commonly referred as the "neoliberal paradox" because NFCs are forced (by their shareholders) to remain competitive and profitable while lacking the conditions for growth through productive investments. Financial activities of NFCs could be said to be a means to "grow fast in a slow-growth economy" (Lin and Tomaskovic-Devey, 2013).

Concurrently, Akkemik and Özen (2014) find that the rise in financial investments in Turkish corporations is a response to macroeconomic uncertainty and increased risks. Soener (2015) adds that NFCs use financial instruments to mitigate risk. Baud and Durand (2012) highlight that the preference for financial liquid assets tends to increase in periods of uncertainty, whereby financial investments seem to follow a kind of "wait-and-see" strategy (invest in these assets until uncertainty dissipates).

Finally and following a neo-institutionalism perspective, Soener (2015) presents two further reasons that could explain NFCs' greater involvement in financial activities. The first is related with a process of organisational learning, according to which managers have a mimetic behaviour and are imitating competitors when they engage in financial activities. The second explanation is associated with an institutional transmission of knowledge and practices between some specific actors (namely financial executives and independent consultants) and managers. The former actors

have a strong *know how* of corporate finance and are able to persuade managers to engage more in financial activities.

However, some authors (e.g. Fazzari *et al.*, 1988; Gertler and Gilchrist, 1994; and Ndikumana, 1999) claim that higher investment in financial assets could be positive and important for productive investments, especially if NFCs use the returns from financial investments to finance real investments. As referred by Orhangazi (2008a and 2008b), this could be quite relevant in the case of small corporations that face greater financial constraints. Nevertheless, the literature on financialisation generally excludes this hypothesis on the grounds that there is no guarantee that NFCs use financial incomes to fund real investments. On the contrary, those incomes will probably be re-invested in financial assets or distributed as dividends to shareholders.

The second channel through which financialisation depresses NFCs' real investment is related with the "profit without investment" assumption (Cordonnier and Van de Velde, 2014), according to which lower retention ratios restrict funds available for real investments; this hampers long-term investment projects, including innovation, research and development (Aglietta and Breton, 2001; Duménil and Lévy, 2004). This is referred to by Hein (2012) and Hein and Dodig (2015) as the "internal means of finance channel". Besides the large dividends payments, the high levels of indebtedness of NFCs in the financialisation era have also implied an upward trend in interest payments in recent years (Orhangazi, 2008a and 2008b).

Managers of NFCs raise short-term payout ratios not only out of personal interests, but also due to shareholder pressure. Moreover, Orhangazi (2008a and 2008b) emphasises that there is an incentive for managers to increase share prices in the short-term (distributing a high level of dividends) because their remuneration schemes are based on the short-term evolution of those prices. He further argues that the growing importance of institutional investors (who seek constant appreciation in share prices) in the financial markets also presses corporations to practice high payout ratios. A failure by NFCs to realise the expected financial payments leads to institutional investors walking out, a fall in share prices and probably a takeover.

Lazonick and O'Sullivan (2000) and Stockhammer (2010) emphasise that the substantial rise in financial payments made by NFCs over the last three decades has been caused by a new design of corporate governance that favours shareholder value, commonly referred to as a "shareholder value orientation". Aglietta (2000) and van der Zwan (2014) note that, largely under the influence of institutional investors (Orhangazi,

2008b), this has been emerging as "the norm of the transformation of capitalism", and contributes to the dissemination of new policies and practices favouring shareholders rather than other constituents of corporations (e.g. managers, employees, the State, customers, etc.). Lazonick and O'Sullivan (2000) state that the orientation has changed from one based on profit retention and reinvestment to one of downsizing the labour forces and distributing profits to shareholders; they refer to this as a shift from a "retain and reinvest" strategy to a "downsize and distribute" strategy. In this context, Levy-Orlik (2012) admit that production decisions dominated by the maximisation of shareholder value seek to reduce production costs and increase share prices without regard for employment, income equality, technological innovation or the industrial side of the business.

Some authors emphasise that the rise in financial payments could foster an increase in real investment (e.g. Orhangazi, 2008a and 2008b). It is argued that higher levels of financial payments signal that corporations have higher levels of profitability and solvency. They are therefore likely to have easier access to funding at lower costs, which could be decisive for the realisation of new real investments.

Despite the increasing amount of theoretical work on the effects of financialisation on investment, empirical studies are limited (Onaran *et al.*, 2011). Nevertheless, a relatively small body of empirical literature has emerged in recent years that estimates investment equations to make an econometric assessment of the impact of financialisation on real investment[17]. Most of these studies find statistical evidence supporting the theoretical claim that financialisation has a negative impact on real investment of NFCs.

Accordingly, Stockhammer (2004a) estimates an investment equation for four countries (Germany, France, UK and US) using the rentier income of NFCs (interest and dividend incomes) as a proxy for financialisation. He finds strong support for financialisation causing a slowdown of capital accumulation in the US and France, some support in the UK and none in Germany. Orhangazi (2008a and 2008b) also finds negative effects of financialisation in the US; he uses not only aggregate data for NFCs but also corporation-level data to breakdown the analysis by sector (manufacturing versus non-manufacturing corporations), industry (durables versus non-durables

[17] As demonstrated by Onaran *et al.* (2011) there are also some theoretical and empirical studies on the effects of financialisation in the other components of the aggregate demand. Here, we focus only on investment.

producers) and dimension (small versus large corporations). He uses two different proxies for financialisation, the financial profits (i.e. the income in the form of interest and dividends) and financial payments (interest and dividends payments and stock buybacks), in order to test the statistical significance of the two channels of financialisation on real investment. Van Treeck (2008) and Onaran *et al* (2011) also conclude that interest and dividend payments had a negative effect on non-financial investment in the US from the 1960s to the 2000s.

We learn from the literature that we must measure the impact of financialisation using two channels: financial receipts and financial payments of NFCs. We should also include variables that control for the eventual overall positive effect of the growth of finance, e.g. the reduction of credit constraints.

The literature has focused almost exclusively on large and highly developed economies, but the negative effect of financialisation on investment can be questioned even in these countries. In what follows, we make an empirical analysis of the role of financialisation in a smaller, less developed and more peripheral economy: the Portuguese economy. Financial markets are less relevant in Portugal, and many corporations are not quoted in the stock market. But even for unquoted corporations, financialisation affects real investment through the two abovementioned channels. Corporations' tendency to prefer financial investment rather than real investment is probably due to the decline in the profitability of real activities and the increased uncertainty from macroeconomic and other sources (e.g. increasing competition from emerging economies). The increase in financial payments may also be linked to a fall in corporations' profitability, leading them to distribute more funds so that shareholders obtain higher returns in the financial markets. In addition, more indebted corporations have to pay higher interest to banks and financial markets. Finally, even though many corporations are not quoted in the stock market, they are owned by business groups led by quoted corporations and so suffer indirectly from the same type of pressure from financial investors. Other shareholders of non-quoted corporations may also be influenced by an economic culture oriented to short-term financial gains and thus demand high dividends from corporations. Namely, corporate shareholders tend to imitate competitors and follow the advice of their financial executives and consultants who are of growing importance to corporate decision-making (Soener, 2015).

3. Financialisation and Real Investment: An Economic Modelisation

Eisner (1974) recognises that the empirical analysis of real investment is not a simple task. Davidson (2000) reaffirms this and stresses that investment decisions are essentially affected by the exogenous "animal spirits" of entrepreneurs and, therefore, hardly follow a stable functional expression.

Nevertheless, there are several studies in the literature on the main determinants of investment by corporations. In his survey of the literature, Stockhammer (2004a) concludes that the main determinants of investment are capacity utilisation, profitability and the relative cost of capital. Orhangazi (2008a and 2008b) notes three additional key real and financial determinants of investment in the literature: output (or sales), level of debt and cash-flow (or internal funds). In the same vein, van Treeck (2008) and Onaran *et al.* (2011) point to profitability and output growth (the latter capturing the accelerator effect) as the main influencers of investment. Some authors also note the importance of savings to finance investment (e.g. Levine, 2005).

In what follows, we estimate an equation in which the investment of NFCs is a function of the standard variables: profitability, level of debt, cost of capital, savings rate and output growth. In addition, we introduce two measures of financialisation in order to isolate the effects of financialisation: financial receipts and financial payments of NFCs. These two variables allow us to assess the relevance of the two channels that are expected to hamper real investment, as described in the previous section.

Our investment function takes the following form:

$$I_t = \beta_0 + \beta_1 P_t + \beta_2 D_t + \beta_3 CC_t + \beta_4 SR_t + \beta_5 OG_t + \beta_6 FR_t + \beta_7 FP_t + \eta_t \qquad \textbf{(1)}$$

, where I is investment of NFCs, P is profitability, D is the corporate debt, CC is the cost of capital, SR is households' savings rate, OG is output growth, FR are financial receipts, FP are financial payments and η_t represents an exogenous investment shock in period t, which is an independent and identically distributed (white noise) disturbance term with null average and constant variance (homoscedastic).

All variables pertaining to NFCs (investment, profitability, debt, financial receipts and financial payments) are expressed as ratios of the respective gross value added. We choose this way instead of using the variables in volume because it better

expresses the relative importance of the financialisation phenomenon. The use of ratios also allows the interpretation of the impact of coefficients in percentage points (p.p.).

It is worth noting that we are proposing to estimate an aggregate investment function, similarly to Stockhammer (2004a), Orhangazi (2008a), van Treeck (2008) and Onaran *et al.* (2011). Since the theory of the behaviour of NFCs is microeconomic in nature and we wish to explain a macroeconomic phenomenon, implicitly we have to assume the existence of a representative corporation. In addition, the use of an aggregate investment function introduces some limitations on the analysis, namely it overlooks both different levels of financialisation among corporations and heterogeneity in the behaviour of corporations by sector, industry, dimension or ownership.

In light of this, we analyse the degree of financialisation according to the dimension of corporations using micro data at corporation-level from *Instituto Nacional de Estatística* (*Sistema de Contas Integradas das Empresas*)[18] for 2011. We use the variable gross fixed capital formation as a proxy of real investment. To capture the first channel related with financialisation, we use two variables: interest and similar incomes (financial receipts in a strict sense)[19]; and interest, similar incomes and other incomes (financial receipts in a broad sense)[20]. The second channel is captured by using two other variables: interest expense and similar charges (financial payments in a strict sense)[21]; and interest expense, similar charges and other charges (financial payments in a broad sense)[22]. All variables were divided by gross value added. For simplicity and in order to avoid skewed results, we only consider corporations with positive figures in all of these variables.

The respective analysis was carried out for small, medium and large corporations (Table 7, Table 8 and Table 9). We excluded micro corporations (up to 9 employees) due to their small dimension and particular investment logics. Two important conclusions can be drawn. First, the degree of financialisation varies

[18] This is a database containing several variables regarding the economic and financial performance of Portuguese corporations (from their balance sheets and income statements).

[19] This variable contains interest received from deposits or other financial applications related with cash surpluses.

[20] This variable also contains dividends received from financial participations.

[21] This variable contains interest payments related with funding costs through credit, commercial paper and bonds emissions.

[22] This variable also contains other payments no directly related with funding costs, other charges with financial investments (alienations with loss), losses with subsidiaries, among others.

positively with the corporation's dimension. In fact, financial receipts and financial payments are higher for larger corporations. Second, the respective correlations of these variables with investment are positive, suggesting that these two channels can affect investment positively. However, correlations between financial payments and investment decline when the corporation's dimension increases. Anyhow, it is worth to note that correlation is different of causality, which means that further analysis should be carried out in future research (also with the use of other explanatory variables) in order to obtain more robust conclusions regarding the effects of financialisation on real investment according with the corporation dimension.

Table 7 – The channels of financialisation for small corporations (from 10 to 49 employees)

Variable	Observations	Mean	Correlation (with Investment)
Financial Receipts (strict)	33714	0.007	0.002
Financial Receipts (broad)	33714	0.153	0.079***
Financial Payments (strict)	33714	0.082	0.115***
Financial Payments (broad)	33714	0.189	0.136***

Note: *** indicates statistical significance at 1% level. Source: *Instituto Nacional de Estatística* (*Sistema de Contas Integradas das Empresas*)

Table 8 – The channels of financialisation for medium corporations (from 50 to 249 employees)

Variable	Observations	Mean	Correlation with Investment
Financial Receipts (strict)	4907	0.019	0.205***
Financial Receipts (broad)	4907	0.206	0.207***
Financial Payments (strict)	4907	0.095	0.115***
Financial Payments (broad)	4907	0.236	0.122***

Note: *** indicates statistical significance at 1% level. Source: *Instituto Nacional de Estatística* (*Sistema de Contas Integradas das Empresas*)

Table 9 – The channels of financialisation for large corporations (more than 250 employees)

Variable	Observations	Mean	Correlation with Investment
Financial Receipts (strict)	820	0.028	0.049
Financial Receipts (broad)	820	0.221	0.100***
Financial Payments (strict)	820	0.142	0.059
Financial Payments (broad)	820	0.249	0.068

Note: *** indicates statistical significance at 1% level. Source: *Instituto Nacional de Estatística* (*Sistema de Contas Integradas das Empresas*)

In this Essay we follow a macroeconomic perspective. The advantage of this approach is that it allows us to study whether the phenomenon has a macroeconomic impact. However, if we find an effect of the financialisation variables we are unable to say if this is due only to the impact of large corporations or if it is a more generalised phenomenon across all corporations. If we do not find any macroeconomic effect of the

financialisation variables, we cannot rule out that they affect a subset of corporations, which however is not enough to generate a macroeconomic effect.

Turning now to the expected impact of the variables, profitability, savings rate and output growth are expected to have a positive influence on investment, unlike cost of capital and the two variables of financialisation which are expected to have a negative effect. The level of debt has an undetermined effect on investment. Therefore, the coefficients of these variables are expected to have the following signs:

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

Explaining now the reasons behind each beta sign, we start with the effect of profitability. It could affect investment positively by determining the level of internal funds available for the realisation of new investments (Stockhammer, 2004a). Secondly, expectations about future economic conditions are one of the most significant determinants of investment (Kopcke and Brauman, 2001); but given the uncertainty about the future, they are largely formed on the basis of past performance. Accordingly and as emphasised by Kuh and Meyer (1955) and Minsky (1975), past rather than expected profitability is the major determinant of investment.

The level of debt may have a positive or negative impact on investment. On one hand, high levels of debt can be a symptom of financial fragility and this limits new investments due to the increased difficulty of obtaining additional financing (either new debt or new equity). If the debt level is perceived unsafe, the rise in debt has a negative effect on investment because future profits may be insufficient to repay existing debt, and this raises the possibility of bankruptcy. On the other hand, if the debt level is considered to be safe (by managers, banks and financial markets), the rise in debt may have no effect on investment, or it may even be positive as it signals increased available funds (Orhangazi, 2008a and 2008b).

Investment also depends negatively on the cost of capital (traditionally measured by the level of real long-term interest rates) on the grounds that investment ultimately depends on the funding or opportunity costs.

Additionally, the savings rate is expected to be positively related with investment given that a higher savings rate will increase the available funds to banks and financial markets, facilitating their intermediation function and the provision of funding through credit and other forms of financing.

Output growth is also expected to be positively related with investment due to the Keynesian acceleration principle. This principle postulates that a rise in the economic activity accelerates capital accumulation (investment) in a higher magnitude, whilst a decrease in economic activity exacerbates capital depletion (disinvestment). Indeed, it is widely recognised that most corporations are more willing to invest in periods of rapid growth than during downturns. Bonfim and Neves (2001) confirm that aggregate investment in Portugal is strongly procyclical[23], despite demonstrating a higher level of volatility than output; this corroborates the stylised facts on investment identified by Sørensen and Whitta-Jacobsen (2005).

Finally, the rise in financial receipts can restrict real investment insofar as NFCs will probably use this income to make further investments in financial assets rather than investing in real activities (the "crowding out" effect). Moreover, the rise in financial payments also constrains real investment by NFCs as it reduces the funds available for financing.

4. Data and Methodology: The Econometric Framework

4.1. Data

We collect annual data from 1977 to 2013 in order to analyse the relationship between financialisation and real investment in Portugal. Data on all variables are available for this period and frequency and are suitable for the study for two reasons. The financialisation phenomenon became more preponderant in Portugal during the 1990s (Lagoa *et al.*, 2013) and we therefore cover periods of both stable and increasing financialisation; and annual data is a suitable frequency to capture the determinants of investment as it is a medium to long-term decision.

Turning now to the definition of variables. We used the gross fixed capital formation of NFCs divided by the respective gross value added, also known as investment rate.

[23] A procyclical behaviour of a certain variable means that there is a positive correlation between the fluctuations of this variable and the GDP (i. e., the business cycle).

We use the gross operating surplus[24] of NFCs divided by the respective gross value added (usually referred to as profit share) as a proxy of profitability.

In order to measure the level of current debt, we use the net lending/net borrowing[25] of NFCs divided by gross value added.

Financial receipts correspond to the sum of corporations' interest and distributed income[26] (where dividends are included) received by NFCs divided by the gross value added of those corporations. Financial payments correspond to the sum of corporations' interest and distributed income (where dividends are included) paid by NFCs divided by their gross value added.

The variables of gross fixed capital formation, gross value added, gross operating surplus, net lending/net borrowing, financial receipts and financial payments of NFCs were collected from the Annual Sector Accounts (at current prices and in millions of euros) of *Instituto Nacional de Estatística*.

We use the real interest rate (deflated by the GDP deflator) from AMECO database in order to measure the cost of capital of NFCs. The short-term real interest rate is used between 1977 and 1984 and the long-term real interest rate, which only became available in 1985[27], is used in the following years. We opt in favour of this strategy instead of using only the short-term real interest rate since investment is a long-term decision and is therefore more affected by long-term interest rates.

[24] According to the Eurostat, "gross operating surplus can be defined in the context of national accounts as a balancing item in the generation of income account representing the excess amount of money generated by incorporated enterprises' operating activities after paying labour input costs. In other words, it is the capital available to financial and non-financial corporations which allows them to repay their creditors, to pay taxes and eventually to finance all or part of their investment".

[25] The net lending/ net borrowing of NFCs is the difference between current savings (plus capital transfers) and the respective investment. According to the OECD, "it reflects the amount of financial assets that are available for lending or needed for borrowing to finance all expenditures – current, gross capital formation, non-produced non-financial assets, and capital transfers – in excess of disposable income". As such, a country's NFCs are net lender /net borrowers when they exhibit positive /negative values of the net lending / net borrowing.

[26] The distributed income of corporations includes dividends and withdrawals from the income of quasi-corporations (amounts that entrepreneurs withdraw for their own use from the profits earned by the quasi-corporations belonging to them).

[27] According to the AMECO database, the real interest rates are obtained from the difference between the nominal interest rates and the inflation rate measured by the GDP deflator. The short-term interest rates correspond to the interest rates on 6-month deposits and the long-term interest rates correspond to the weight average of public and private bonds over five years.

The savings rate corresponds to the gross savings of households as a percentage of their disposable income from PORDATA database[28].

As usual, we use the annual growth rate of GDP to describe the evolution of output growth. This variable was collected from the PORDATA database (at current prices and in million of euros) and it was deflated using the GDP deflator (2006=100), also available on the same database.

Table A1 in Appendix and Table 10 contain the descriptive statistics of the data and present the corresponding correlation matrix between variables, respectively.

Table 10 – The correlation matrix between variables

	I	***P***	***D***	***CC***	***SR***	***OG***	***FR***	***FP***
I	1							
P	-0.338**	1						
D	-0.554***	0.859***	1					
CC	-0.560***	0.659***	0.610***	1				
SR	0.148	-0.592***	-0.493***	-0.390**	1			
BC	0.476***	-0.108	-0.065	-0.344**	0.392**	1		
FR	-0.378**	0.447***	0.377**	0.591***	-0.702***	-0.502***	1	
FP	-0.076	-0.518***	-0.619***	-0.134	0.511***	-0.317*	0.002	1

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

As preliminary evidence on the hypotheses under study, note that financial receipts and financial payments are negatively related with investment. Additionally, it should be noted that the absolute values of all correlation coefficients are lower than 0.8, which is crucial to exclude the existence of severe multicollinearity between the variables (Studenmund, 2005). The only exception is the correlation between profitability and debt, but the existence of severe multicollinearity can be rejected for all variables since the Variance Inflation Factors (VIF) for each variable is lower than the traditional ceiling of 10 (Table A2 in Appendix) - Kutner *et al.*, 2004. Although debt is an exception to this, the respective VIF is only slightly higher than 10.

4.2. Methodology

The previous papers studying the impact of financialisation on investment use Partial Adjustment and the Autoregressive Distributed Lag (ARDL) Models (Stockhammer, 2004a), Ordinary Least Squares (Orhangazi, 2008a), or Error Correction Models (van Treeck, 2008; and Onaran *et al.*, 2011). We use a VAR/VECM methodology because it assumes that all variables are endogenous, which is appropriate

[28] Please see http://www.pordata.pt/.

for the set of variables under study, and it enables us to examine the dynamic reaction of all variables to shocks. If the variables are cointegrated, we can use a VECM to distinguish the short term and long term effects of financialisation.

This methodology involves six stages. First, we carry out unit root tests. The analysis of unit roots is always crucial, as many macroeconomic series violate the assumption of stationarity (Nelson and Plosser, 1982). In that situation, the variance is infinite, shocks are permanent and the correlation between different series is close to one, which tends to originate spurious results that are counterproductive to the standard inference procedures. In this regard, we apply the traditional unit root tests, in order to conclude about the order of integration of each variable[29]. We apply the conventional augmented Dickey and Fuller (ADF) (1979) test and the Phillips and Perron (PP) (1998) test.

Having done this and if all variables are non-stationary in levels and stationary in first differences, i.e. integrated of order one, we test if there is a cointegration relationship between them. Engle and Granger (1987) postulate that a linear combination of two (or more) non-stationary variables can be stationary. Thus, the non-stationary variables are called to be cointegrated. In this regard, the stationary linear combination of variables is the cointegration equation and represents the long-term relationship between the variables. Against this backdrop, we employ the methodology proposed by Johansen (1991 and 1995), in order to conclude about the existence of cointegration relationship between our variables, through the Trace test and the Maximum Eigenvalue test.

Thirdly, we estimate the model using either a Vector Autoregressive (VAR) Model if variables are stationary in levels or integrated of order one but not cointegrated; or a VECM if variables proved to be integrated of order one and cointegrated[30]. VAR models were introduced by Sims (1980) and treat all variables as endogenous and as a function of the lagged values of all variables in the system. Mathematically, a VAR model with k variables can be represented by:

[29] The order of integration is the number of unit roots contained in the series or the number of differencing operations that it necessary takes into account to make the series stationary. In fact, if a non-stationary series must be differentiated d times to become stationary, it is said that is integrated of order d or $I(d)$. Thus, a stationary series is integrated of order zero or $I(0)$ and so on.

[30] Note that if variables are non-stationary but not cointegrated, we should also use VAR models by differentiating all variables.

$$y_t = A_1 y_{t-1} + ... + A_p y_{t-p} + \mu + u_t \quad \textbf{(3)}$$

, where y_t is a k vector of variables, A_i is a matrix of coefficients to be estimated, p is the number of lags, μ is a vector of k constants and u_t is a vector of k innovations that may be contemporaneously correlated but are uncorrelated with all of the right-hand side variables (u_t is a independent and identically distributed disturbance term - white-noise). A VECM is a restricted VAR for cointegrated non-stationary variables, which can be written as:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \mu + u_t \quad \textbf{(4)}$$

This allows the dynamic relationship between variables to be modelled using their differences but imposes an adjustment to the long-term equilibrium. Here, Π and Γ are the matrices containing the long and short-term information, respectively, such that:

$$\Pi = \sum_{i=1}^{p} A_i - I \quad \textbf{(5)}$$

$$\Gamma_i = -\sum_{j=i+1}^{p} A_j \quad \textbf{(6)}$$

The long-term matrix Π can also be written as $\Pi = \alpha\beta'$, where α measures the speed of adjustments of the variables towards the equilibrium and β is the matrix of long-term coefficients or the cointegration matrix.

Some diagnostic tests are conducted in the fourth stage to assess the adequacy of our results. We employ the autocorrelation LM test, the Ramsey RESET test, the normality test of residuals, the heteroscedasticity test and the stability test. We also 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.

We then run Granger (1969) causality tests, which allow us to determine whether the current value of a certain variable y can be predicted by its past values and the past values of the other variables in the VAR.

Finally, we analyse impulse response functions (IRFs) in order to determine the short and long-term effect of an isolated shock on each variable. These functions

identify the short and long-term effects in the endogenous variables of an isolated shock on one of them, and complement the findings obtained with Granger causality analysis.

5. Empirical Results and Discussion

We start by analysing the presence of unit roots by looking at the plots of variables (Figure A1 to Figure A8 in Appendix), which indicate that all variables are non-stationary in levels. Employing the ADF and the PP tests (Table 11 and Table 12), we conclude that for all seven variables the null hypothesis of a unit root cannot be rejected at the traditional significance levels[31]. The only exception is the cost of capital, for which the null hypothesis of non-stationarity is rejected by the PP test. However, the null hypothesis is not rejected by the ADF test, which is more suitable than the PP test for finite samples (Davidson and MacKinnon, 1999); we therefore assume cost of capital has a unit root. We then carried out the same two types of unit root test for the first differences of the variables, and we conclude they are all stationary. Our variables are therefore non-stationary in levels but stationary in first differences, i.e. they are all integrated of order one.

The next step is to determine the optimal lag length according to information criteria and considering an unrestricted VAR in levels. Table 13 contains the optimal number of lags suggested by each information criteria. The search was made with the number of lags varying between zero and two; the VAR does not satisfy the stability condition when there is a higher number of lags since at least one root of the characteristic polynomial is outside the unit circle (Lütkepohl, 1991) (Table A3 in Appendix). Furthermore, we do not need more than two lags given that we are using annual data. Although there is no concordance between the information criteria, we choose two lags given that FPE and AIC criteria are preferable in the case of small samples (sixty observations and below) - Liew, 2004.

Then, we apply the Johansen (1991 and 1995) methodology to determine the existence of cointegration between our variables, using both the Trace and the Maximum Eigenvalue tests. This requires us to select the deterministic trend for inclusion in the cointegration equation. Thus, we conduct the Johansen test considering

[31] Unless otherwise stated, empirical results of this Chapter were obtained with Eviews software.

all five standard assumptions and make our decision based on information criteria (Table 14).

Table 11 – *P-values* of the ADF unit root test

Variable	Level			First Difference		
	Intercept	***Trend and Intercept***	***None***	***Intercept***	***Trend and Intercept***	***None***
I	0.007	0.022*	0.305	0.006*	0.032	0.001
P	0.344*	0.616	0.917	0.000	0.002	0.000*
D	0.403	0.651	0.098*	0.000	0.000	0.000*
CC	0.006	0.006	0.195*	0.000	0.000	0.000*
SR	0.700	0.870	0.256*	0.000	0.001	0.000*
OG	0.145	0.617*	0.032	0.001	0.002*	0.000
FR	0.172*	0.097	0.625	0.015	0.066	0.000*
FP	0.015	0.712*	0.161	0.002	0.040	0.000*

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 12 – *P-values* of the PP unit root test

Variable	Level			First Difference		
	Intercept	***Trend and Intercept***	***None***	***Intercept***	***Trend and Intercept***	***None***
I	0.238*	0.394	0.344	0.016	0.078	0.001*
P	0.021*	0.182	0.890	0.000	0.002	0.000*
D	0.363	0.582	0.097*	0.000	0.000	0.000*
CC	0.006	0.005*	0.004	0.000	0.000	0.000*
SR	0.714	0.335*	0.393	0.000	0.000	0.000*
BC	0.147	0.105*	0.036	0.000	0.000	0.000*
FR	0.219*	0.360	0.618	0.003	0.015	0.000*
FP	0.233*	0.377	0.514	0.005	0.028	0.000*

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

Table 13 – Values of the information criteria by lag

Lag	LR	FPE	AIC	SC	HQ
0	n. a.	1.3e-25	-34.6	-34.3	-34.5
1	261.1*	2.4e-28	-41.0	-37.8*	-39.9*
2	77.5	2.3e-28*	-41.6*	-35.6	-39.6

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

Table 14 – Number of cointegration relations by type of model specification (at 5% significance level)

Data trend *(Test Type)*	**None** *(No intercept No trend)*	**None** *(Intercept No trend)*	**Linear** *(Intercept No trend)*	**Linear** *(Intercept Trend)*	**Quadratic** *(Intercept Trend)*
Trace test	1	2	3	3	3
Maximum Eigenvalue test	1	1	1	2	2

Note: We use only one lag to run this test, because the test is done using the first differences of the variables

The results are contradictory not only in relation to the optimal number of lags, but also regarding the deterministic trend specification; this may be due to the small sample size (Brooks, 2009). Nonetheless, they at least suggest that our seven variables are cointegrated, irrespective of the model specification used. Indeed, the number of

cointegration relations is always higher than zero and lower than the number of variables for any model specification, either by the Trace test or by the Maximum Eigenvalue test.

When determining the number of lags, the deterministic trend specification and the number of cointegration relations, the AIC criterion selects the fourth model (the level data and the cointegrating equations have linear trends) and suggests a VECM with three lags, but SC selects the second model (the level data have no deterministic trends and the cointegrating equations have intercepts) and confirms a VECM with one lag. We choose to use the SC criteria (which selects the second model) because as there is no significant trend in levels for some of our variables (Figure A1 to Figure A8 in Appendix).

Under these circumstances, the Trace test reveals two cointegration relationships, whilst the Maximum Eigenvalue test indicates only one. We consider one cointegrating vector because some authors warn that when these two tests have conflicting results for small samples, the Maximum Eigenvalue test should prevail for inferences because it is more reliable (e.g. Johansen and Juselius, 1991; Gregory, 1994; Dutta and Ahmed, 1999; among others).

Hence, we run a VECM considering one cointegrating vector, the second specification model, and one lag, and after conducting five usual diagnostic tests (Table 15). For the autocorrelation LM test, we cannot reject the null hypothesis of no serial correlation of residuals up to one lag, and this also holds for a higher number of lags. Regarding the Ramsey RESET test, we cannot reject the null hypothesis of no misspecification, thus confirming the adequate functional form of our model. For the normality test, we do not reject the null hypothesis that the residuals are normally distributed using a significance level of 1%, but we reject it for higher significance levels. This is not considered very serious because the central limit theorem guarantees the normality of residuals as our sample has more than thirty observations. Indeed, Hendry and Juselius (2000) recognise that the normality assumption is seldom satisfied in economic applications, which does not invalidate the global robustness of our estimations or the statistical inference. In relation to the heteroscedasticity test, we cannot reject the null hypothesis of homocedasticity. Regarding the model's stability, we conclude that there are seven eigenvalues or unit roots (Table A4 in Appendix), which means the estimated VECM is stable as the difference between our eight variables and the seven eigenvalues is equal to one (Lütkepohl and Krätzig, 2004).

Finally, the plots of the CUSUM and CUSUMSQ tests (Figure A9 and Figure A10 in Appendix) suggest that our coefficients are generally stable over time and confirm the absence of significant structural breaks because the recursive residuals lie between the straight lines at 5% significance levels. In short, the estimated VECM is well specified according to the econometrics tests performed.

Table 15 – Diagnostic tests for VECM estimations

Test	F-statistic	*P-value*
Autocorrelation test (up to one lag)	60.510	0.601
Ramsey's RESET test	1.558	0.224
Normality test (Jarque-Bera)	27.395	0.037
Heteroscedasticity test	0.059	0.810
Stability (AR root) test	n. a.	Seven eigenvalues

Note: The Ramsey RESET test and the heteroscedasticity test were performed in Microfit software (5.0 version)

We choose to normalise on investment in the long-term equation given our interest in estimating an investment equation. The long-term relationship is shown in Table 16 and the short-term relationship is presented in Table 18.

Table 16 – The long-term estimations of investment

Variable	P_t	D_t	CC_t	SR_t	OG_t	FR_t	FP_t	β_0
I_t	1.490***	-0.442***	-1.066***	0.528***	0.499***	1.140***	-0.221***	-0.425***
	(0.135)	(0.061)	(0.101)	(0.154)	(0.131)	(0.206)	(0.073)	(0.069)
	[-11.019]	[7.213]	[10.542]	[-3.432]	[-3.816]	[-5.547]	[3.022]	[6.204]
Observations: 35 (1979-2013)								

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

In the long-term, all variables are statistically significant and all coefficients have the expected signs, with the exception of financial receipts. Surprisingly, these receipts are a positive determinant of investment in the long-term: when they increase 1 p.p., investment increases by around 1.1 p.p.. This seems to demonstrate that investment in financial activities does not significantly divert funds from real activities, excluding the hypothesis of "crowding out". Alternatively, it could mean that returns on financial investments are used to finance real investments rather than to fund further financial activities. Nonetheless, this apparent contradiction with the literature on financialisation may be explained by the large proportion of small and medium corporations in Portugal facing financial constraints and therefore more dependent on any income to make new investments. Simultaneously, the explanation may also lie in the small number of Portuguese corporations quoted in the stock market since they ultimately have fewer funding sources. In turn, financial payments have a negative impact on real investment:

a rise of 1 p.p. in these payments decreases investment by about 0.2 p.p., which supports the above hypothesis.

Turning now to the control variables, profitability positively influences investment in the long-term: a 1 p.p. increase in profitability raises investment by about 1.5 p.p.. This suggests that either profits are used to finance investment or new investment is being made in the expectation of a large profit rate. Debt negatively influences investment; a 1 p.p. rise in this variable reduces investment by around 0.4 p.p.. This indicates that indebtedness could be limiting the capacity of NFCs to obtain further funding, or that debt is being used to repay existing debts rather than to make investment. Also as expected, the cost of capital exerts a negative impact on real investment: a 1 p.p. increase in this cost reduces investment by about 1.1 p.p.. In contrast, the household savings rate is a positive determinant of investment: a 1 p.p. increase in the savings rate leads to a 0.5 p.p. rise in investment. Likewise, output growth positively affects corporations' investment: a 1 p.p. increase in economic activity raises investment by around 0.5 p.p., which shows that investors are more willing to invest when economic growth increases and confirms that investment is procyclical. However, this is not in line with the acceleration principle as the coefficient of output growth is less than one.

Table 17 – Error correction term estimations

Variable	ΔI_t	ΔP_t	ΔD_t	ΔCC_t	ΔSR_t	ΔOG_t	ΔFR_t	ΔFP_t
Error	-0.287**	0.275*	0.963*	-0.053	0.207*	-0.118	0.041	0.542*
Correction	(0.168)	(0.168)	(0.607)	(0.295)	(0.161)	(0.209)	(0.130)	(0.401)
Term	[1.700]	[1.635]	[1.586]	[-0.180]	[1.290]	[-0.566]	[0.314]	[1.350]

Note: Δ is the operator of the first differences, standard errors in ( ), t-statistics in [], ** indicates statistical significance at 5% level and * indicates statistical significance at 10% level

Table 17 presents the estimates for the error correction terms, which measure the adjustment of variables to the long-term equilibrium. The most important finding is that the coefficient of investment is the only one that is statistically significant at a 5% level and exhibits a negative value; it confirms that this variable contributes to the convergence to the long-term equilibrium and it is therefore reasonable to be the endogenous variable. The coefficient of investment indicates that 28.7% of the deviation from the long-term equilibrium in one period is automatically corrected in the next period. Moreover, using a 10% level of significance, only the error correction terms of profitability, debt, savings rate and financial payments are statistically significant. At the same time, it is interesting to note that the adjustment of profitability

and savings rate to the long-term relationship helps correct a possible disequilibrium, given the positive values of their error correction terms. Furthermore, the error correction terms of cost of capital and financial receipts indicate that these two variables also contribute to the correction of disequilibrium in the long-term relationship, although they are not statistically significant.

Table 18 – The short-term dynamic of investment

Variable	ΔI_{t-1}	ΔP_{t-1}	ΔD_{t-1}	ΔCC_{t-1}	ΔSR_{t-1}	ΔOG_{t-1}	ΔFR_{t-1}	ΔFP_{t-1}
ΔI_t	0.193*	0.283**	-0.145*	-0.042	0.370*	0.068	0.423	-0.182
	(0.137)	(0.161)	(0.099)	(0.131)	(0.236)	(0.158)	(0.347)	(0.162)
	[1.404]	[1.751]	[-1.456]	[-0.317]	[1.567]	[0.432]	[1.219]	[-1.118]
Observations: 35 (1979-2013); $\mathbf{R^2}$ = 0.636; $R^2_{adjusted}$ = 0.524; **F-statistic** = 5.670; **Log Likelihood** = 99.805								

Note: Δ is the operator of the first differences, standard errors in ( ), t-statistics in [], ** indicates statistical significance at 5% level and * indicates statistical significance at 10% level

There are only four variables which are statistically significant in explaining real investment in the short-term: lagged investment, profitability, the level of debt and savings rate. Lagged investment is a relevant determinant of the contemporaneous investment, which demonstrates the level of persistence and inertia of this macroeconomic variable. As expected, profitability and savings rate continue to have a positive influence on investment in the short-term, and debt also maintains a negative effect on investment. The remaining variables are not statistically significant but have the expected signs with the exception of financial receipts. Note that all signals of the short-term estimates are equal to the signals of the long-term estimates; this shows real investment has a similar reaction to these variables either in the long-term or short-term.

Table 19 – Granger causality tests

Null hypothesis	**Chi-square**	***P-value***
$\Delta P_t \rightarrow \Delta I_t$	3.066	0.080
$\Delta D_t \rightarrow \Delta I_t$	2.119	0.145
$\Delta CC_t \rightarrow \Delta I_t$	0.100	0.751
$\Delta SR_t \rightarrow \Delta I_t$	2.458	0.117
$\Delta OG_t \rightarrow \Delta I_t$	0.187	0.666
$\Delta FR_t \rightarrow \Delta I_t$	1.485	0.223
$\Delta FP_t \rightarrow \Delta I_t$	1.249	0.264

Note: → means that the variable on the left of the sign does not Granger cause the variable on the right, and Δ is the operator of the first differences

We then conduct Granger causality tests to gauge how past changes in one variable (with all other variables constant) affect investment in the short-term (Table 19). Profitability (at a 10% significance level) is the only variable that causes

investment. For the remaining variables, the null hypothesis of non-causality is not rejected. In light of this, we can state that the contemporaneous investment of NFCs is only affected by the past values of profitability.

Thus far we have made a *ceteris paribus* analysis, but we now have to resort to IRFs to measure how an unanticipated shock in one variable affects dynamically investment. These functions allow all the variables to change and they simulate how the economy will react to a contemporaneous shock in one variable (with the short-term and long-term relations operating).

It is important to refer that the ordering of variables could change the profile of the IRFs (Enders, 2003; and Lütkepohl and Krätzig, 2004). Two approaches can be taken to identify the IRFs. First, we can use the generalised IRFs proposed by Koop *et al.* (1996) and Pesaran and Shin (1998); this does not require the ordering of variables, i.e. the choice of variables that react in the same year to shocks in other variables. The second approach is to apply a Cholesly decomposition in which variables must be ordered from the most exogenous to the most endogenous from a contemporaneous point of view. We adopt the generalised IRFs in order to avoid ambiguity in the ordering of variables (Figure 19). This function identifies the innovation to the $y-th$ variable by applying a variable specific Cholesky factor computed with the $y-th$ variable at the top of the Cholesky ordering.

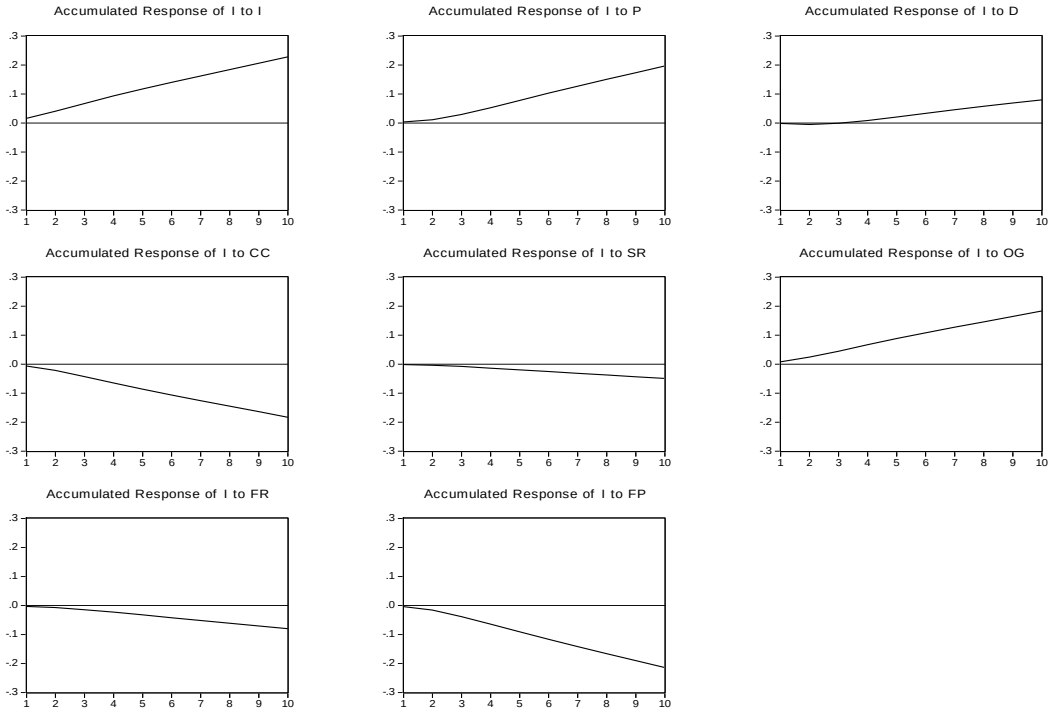
Results show that investment responds negatively to a shock in financial receipts, confirming the initial hypothesis regarding this variable. This reveals that corporations do not use financial incomes to finance productive investments, but probably use them to increase their engagement with financial activities. Note that the IRFs show that a positive shock in financial receipts reduces corporations' profitability and economic growth in the long term (Figure A11 and Figure A12 in Appendix); this explains their negative dynamic effect on investment, despite the identified positive effect of financial receipts on the long-term and short-term investment equations.

On the other hand, the response of investment to a shock in financial payments is relatively pronounced and negative, thus reinforcing the argument that pressures for financial payments decrease investment. Therefore, both channels of financialisation have a disruptive effect on investment in a dynamic way, but the negative effect of the channel of financial payments is more vigorous.

The level of debt has a small positive dynamic effect on investment, probably because it allows corporations without enough equity and internal means of finance to undertake investment. A shock in debt produces a positive effect on profitability and on output growth (Figure A11 and Figure A12 in Appendix), thus leading to an increase in investment.

The unanticipated changes in the remaining variables have the expected impacts on investment, with the exception of the savings rate. In fact, the response of investment to a shock in the savings rate is slightly negative in a dynamic way, which is contrary to the long-term and short-term estimates. This signals that a higher level of savings involves less consumption by households, which implies a deceleration of the economic activity and profitability that hampers new investments by NFCs – this is confirmed by the IRFs (Figure A11 and Figure A12 in Appendix).

Figure 19 – Generalised IRFs (accumulated responses of investment to one s.d. innovations)



We now move on to check robustness. It is worth noting that the results would not have changed considerably if we had chosen the fourth model (the level data and the cointegration equations have linear trends), as proposed by the AIC criteria in the Johansen test (Table 14). In the long-term, all variables remain statistically significant and maintain their signs (Table A5 in Appendix). In the short-term, lagged investment

and profitability are the only variables that are statistically significant in explaining real investment, and maintain positive coefficients (Table A6 in Appendix). The profile of the generalised IRFs is also quite similar (Figure A13 in Appendix).

On the other hand, we can only use the short-term real interest rate to measure the cost of capital, instead of using a combination of both the short-term and long-term real interest rate as above. However, the short-term real interest rate is stationary in levels, i.e. integrated of order zero, which prevents the use of a VECM. As an alternative, we apply the ARDL model presented by Pesaran (1997), Pesaran and Shin (1999) and Pesaran *et al.* (2001); this is appropriate when there is a mixture of variables that are integrated of order zero and one. Applying this methodology, we conclude that all variables are cointegrated (Table A7 in Appendix) and statistically significant in the long-term, except the savings rate (although this maintains a positive coefficient). The level of profitability, output growth and financial receipts continue to positively influence the investment rate, while the level of debt, the cost of capital and financial payments continue to exert a negative influence (Table A8 in Appendix). In the short-term, there are only four statistically significant variables and with the expected signs: lagged investment, level of debt, cost of capital and output growth. The error correction term of investment also maintains its negative sign and is statistically significant; this confirms the existence of convergence to the long-term equilibrium (Table A9 in Appendix).

In conclusion, we find evidence supporting the claim that financialisation affects the Portuguese real investment, mainly through the financial payment channel. In fact, the long-term investment function only shows the negative effect of financial payments. Investment also reacts to deviations from the long-term relationship that depends on the financialisation variables. In the short-term, the lagged changes in financial receipts and financial payments do not seem to have an effect on investment. Finally, the dynamic response of investment to shocks in financial receipts and financial payments (combining the short and long-term responses) shows that while both channels have a disruptive effect on investment, this is greater in the financial payments channel. Another important conclusion concerns the debt variable which exerts a negative impact on investment both in the long-term and in the short-term. This suggests that the levels of indebtedness of NFCs, which have grown with financialisation since the 1990s, have also helped contain productive investments by restricting NFCs' ability to obtain further funding.

6. Conclusion

The aim of this Essay was to analyse whether financialisation supported or disrupted the real investment of NFCs in Portugal between 1977 and 2013, using aggregate macroeconomic annual data. As opposed to conventional economic theory, the literature on financialisation indicates two ways in which the growth of finance reduces real investment by NFCs. On one hand, the increase in financial investments by NFCs deviates funds from productive investment. On the other, the pressure on NFCs from financial markets to raise financial payments also decreases the available funds for financing real investments. In this context, we estimated an equation for investment behaviour using two variables to reflect the two channels of financialisation (financial receipts and financial payments), in addition to the usual variables (profitability, debt, cost of capital, savings rate and output growth).

As we found cointegration between the variables, we estimated a VECM which allowed us to distinguish between short-term and long-term effects on investment. In the long term, we are able to identify that financial payments exert a negative impact on real investment, in accordance with the literature on financialisation. Nonetheless, in contradiction with this literature, we find that financial receipts positively influence real investment; this can be explained by the large number of small and medium corporations in Portugal that face high funding constraints and therefore use all incomes (even financial) to make new investments. In addition, the profile of the IRFs (that combine the short and long-term responses) illustrates that financial receipts and financial payments have a negative impact on real investment, but this effect is more pronounced for the latter variable. Another important finding is that debt has a negative long-term and short-term impact on investment. This indicates that the indebtedness of NFCs limits their ability to obtain more funding to support real investments in a context where new debts are used to repay existing debts.

Our findings show that the negative effects of financialisation on real investment are not an exclusive phenomenon of the most developed and financialised economies, like the US and UK, but also occur in smaller, less developed, less financialised and more peripheral economies like Portugal.

Future research should analyse the statistical relevance of these two channels using corporation-level data in order to identify the heterogeneity in the behaviour of NFCs by sector, industry and size, as in Orhangazi (2008b). An alternative line of

research would be to investigate the determinants of financialisation, following the approach of Akkemik and Özen (2014) and/or Soener (2015), where the measures of financialisation are treated as dependent variables. A further extension of this work would be to evaluate the impact of financialisation on the other components of aggregate demand, namely on consumption and external demand, as in Onaran *et al.* (2011).

IV. Financialisation and Real Investment in the European Union using a Country-level Analysis: Beneficial or Prejudicial Effects?[32]

1. Introduction

Conventional economic theory finds that the growth of finance fosters economic growth due to the positive association between savings and investments (e. g. Levine, 2005). Nevertheless, scholars of financialisation (Orhangazi, 2008a and 2008b; Hein and van Treeck, 2010; Hein, 2012; Hein and Dodig, 2015; among others) postulates that the increasing growth of finance harms the real investment of NFCs through two channels. The first channel involves the NFCs' greater engagement in financial activities, which tends to divert funds from real investments ("crowding out" effect). The second is caused by the strong pressures on NFCs to increase their financial payments (interest, dividends and/or stocks buybacks) to the financial markets and respective shareholders, which leads to lower retention ratios and fewer funds for long-term productive projects.

In light of this, some empirical studies have been conducted in recent years to assess the relationship between financialisation and real investment. Most of these derive and estimate investment equations that find statistical evidence of the prejudicial effects of the phenomenon on real investment (e.g. Stockhammer, 2004a; Orhangazi, 2008a and 2008b; van Treeck, 2008; and Onaran *et al.*, 2011).

This Essay examines the impact of financialisation on the real investment of NFCs in EU countries between 1995 and 2013, contributing to the literature in two ways. First, it focuses on EU countries, whereas most studies are oriented to the specificities of large, highly developed and financialised countries like the US or the UK. Second, a panel data econometric analysis is used rather than the time series econometric analysis more usual in empirical studies on this matter. This allows us to understand whether the prejudicial effects of financialisation have been generalised and transversal to a large set of countries or, alternatively, specific to certain countries. The use of a panel data econometric analysis also permits a larger number of observations and sample variability and thus improves the accuracy of estimates.

[32] This Essay is already published in Working Paper Series of Dinâmia'CET-IUL and it was already submitted to *Review of Political Economy*.

EU countries represent an interesting case study as they share common economic rules because they belong to the same economic and political region. However, these countries have some diversity in terms of financialisation due to their different types of financial system ("bank-based (or dominated) financial system" or "market based" in the typology of Sawyer (2013b)) and distinct growth models in the era of financialisation ("debt-led consumption boom", "domestic demand-led" and "export-led mercantilist" in the classification of Hein (2012)). These dissimilarities could explain the differences in the countries' levels of financialisation (Table A14 and Table A15 in Appendix). Despite this heterogeneity, there has been a downward trend in the investment rate in most of these countries (Figure A14 in Appendix), simultaneously with a rise in financial receipts and financial payments (Figure A20 and Figure A21 in Appendix). It is therefore interesting to determine whether there is a disruptive relationship between financialisation and real investment.

Accordingly, we estimate an investment equation using standard variables (profitability, debt, cost of capital, savings rate and the output growth) and two additional variables linked to financialisation (financial receipts and financial payments). We estimate an aggregate investment function given our interest in studying a macroeconomic issue.

It is concluded that financialisation exerts a negative influence on the real investment of EU countries, mainly through the second channel (either interest or dividends payments). This confirms our suspicion that the disruptive relationship between financialisation and real investment is a generalised phenomenon with a negative effect on EU countries from a macroeconomic point of view. However, we also conclude that the harmful effects of financialisation on real investment are greater in more financialised countries than in less financialised ones. It is also found that debt has a negative influence on real investment, which indicates that the higher debt levels of NFCs prevent them from obtaining new debts to finance productive investments.

The remainder of the Chapter is organised as follows. In Section 2, we give an overview of the theoretical and empirical literature on the relationship between financialisation and real investment of NFCs. An investment equation is built in Section 3. The data and the econometric methodology are described in Section 4. Section 5 presents the main findings and the respective discussion. Finally, Section 6 concludes.

2. The Relationship between Financialisation and Real Investment

It is generally accepted that higher rates of physical capital accumulation are crucial to sustain more dynamic economic growth and employment creation. Conventional economic theory advocates that the growth of finance is generally a positive phenomenon that supports the real investments of NFCs given the link between savings and investments. This idea has been reinforced by some empirical studies, which find a positive relationship between the growth of finance and economic growth (Levine, 2005; Ang, 2008; Arestis *et al.*, 2015).

Nonetheless and according to the literature on financialisation, the growth of finance can be prejudicial to the real investments of NFCs through two distinct channels and it is theoretically discussed by Orhangazi (2008a and 2008b), Hein and van Treeck (2010), Hein (2012), Hein and Dodig (2015), among others. Figure 20 exhibits the channels (and factors that contribute to feed each of them) associated to the effects of financialisation on real investment.

Figure 20 – The channels associated to the prejudicial effects of financialisation on real investment

Slowdown of real investment	**Involvement in financial activities (more financial receipts)**	Shorter planning horizons More concerns about profits Falling profits in the real sector Increasing external funding costs Macroeconomic uncertainty Changes in corporate governance Mimetic behaviour Institutional transmission
	Lower retention ratios (more financial payments)	High levels of indebtedness Profit-based remunerations Importance of institutional investors "Shareholder value orientation"

Source: Authors' representation based on Orhangazi (2008a and 2008b), Hein and van Treeck (2010), Hein (2012), Hein and Dodig (2015), among others

The first channel involves NFCs' increasing investments in financial activities and financial assets, which takes funds from real and productive activities. This is labelled by Hein (2012) and Hein and Dodig (2015) as the "management's preference channel". As both external and internal funds are limited, NFCs can only use these funds to invest in financial or real activities, since financial investments and real investments are considered perfect substitutes (Tobin, 1965). Thus, NFCs have fewer funds for real and productive investments when they increase their financial

investments, and this is commonly referred to as the "crowding out effect" on real investment.

Krippner (2005) confirms that NFCs in the US have increased their involvement in financial investments, as revealed by the growing importance of financial revenues and profits vis-à-vis the revenues and profits from real investments. Similarly, Cingolani (2013) argues that this behaviour expresses a higher accumulation of financial rents to the detriment of productive accumulation. The literature on financialisation offers several explanations to describe this stance by NFCs.

Firstly, Crotty (2005) advocates that the rise in financial investments (normally in the form of buying financial subsidiaries or expanding an already existing one) has been determined by NFCs' shorter planning horizons that are incompatible with the pursuit of long-term real projects. This short-termism mirrors a tendency among investors to sacrifice long-term investment projects in order to increase short-term profits (Aspara *et al.*, 2014). According to Samuel (2000), this focus on short-term profits instead of long-term expansion reflects a certain "managerial myopia".

Secondly, Crotty (1990) concludes that shareholders are more concerned about current profitability than long-term expansion or, ultimately, the corporations' actual survival. Orhangazi (2008a and 2008b) stresses the strong pressures (essentially exerted by shareholders) on managers to achieve higher short-term returns. These pressures encourage financial investments, which tend to produce larger and more speculative short-term profits rather than real investments that normally involve more uncertainty and only produce profits in the medium and long-term. This is the so-called "rent-seeking behaviour" of NFCs. In fact, Hein (2012) and Hein and Dodig (2015) stress that NFCs face a "growth-profit trade-off" because shareholders' orientations are mainly for short-term profitability. Once again, this discourages the implementation of real capital projects. Baud and Durand (2012) also state that NFCs intensify their financial investments during bull markets which produce higher levels of profits and respond to the pressures of shareholders. Levy-Orlik (2012) notes that NFCs sometimes repurchase their own shares in order to prevent hostile takeovers, which also leads to a rise in share prices and increases short-term profits. Tomaskovic-Devey *et al.* (2015) even stress that managers' performance is no longer evaluated on market share but on their ability to generate short-term profits and increased share prices.

Thirdly, Crotty (2005) and Orhangazi (2008a and 2008b) argue that NFCs may be engaging more in financial activities in reaction to the downward trend of profits

from the real sector and the increase in external funding costs since the 1980s. Baud and Durand (2012) confirm that US retailers' involvement in financial activities is the result of the decline of profitable opportunities in real investments, motivated by the maturation of markets, low profitability rates, stricter regulations, sluggish consumer demand and increasing competition. Soener (2015) notes that this is the political economy perspective in which NFCs are becoming more financialised so as to remain viable. Crotty (2005) terms this the "neoliberal paradox"; he claims that shareholders tend to coerce NFCs to remain competitive and profitable even in downturn environments, thus inducing managers to move from productive to financial investments. According to Lin and Tomaskovic-Devey (2013), this behaviour reflects the NFCs strategy of "growth fast in a slow-growth economy".

Fourthly, Akkemik and Özen (2014) advocate that macroeconomic uncertainty and increased risks together with institutional changes in corporate governance are the main reasons behind the rise in financial investments by NFCs. They tested these hypotheses using a panel data econometric analysis for 41 corporations quoted in Istanbul Stock Exchange for the period between 1990 and 2002. However, they found that this channel is mainly determined by highly uncertain macroeconomic environments and by the characteristics of corporations (such as size), whilst institutional features (e.g. close ties with the government, family ownership, discretion of managerial power and unionisation) do not have a statistical significant impact on financialisation. In fact, Baud and Durand (2012) stress that there is a greater preference for liquid assets in business environments characterised by high levels of uncertainty as the financial investments of NFCs represent a kind of "wait-and-see" strategy. In turn, NFCs involve themselves in financial activities through financial instruments, which hedge several risks against uncertainty (Soener, 2015).

Fifthly and following a neo-institutionalism perspective, Soener (2015) adds two further explanations to describe the growing importance of NFCs' financial investments. First, he stresses that NFCs learn to financialise with other corporations, i.e. the so-called "mimetic behaviour". Second, he emphasises that some actors (like financial executives or independent consultants) influence investors and managers to make more financial investments. Here, there is an institutional transmission of knowledge and practices from the know-how of these actors in the corporate finance field to the respective investors and managers.

Nonetheless, some authors (e.g. Fazzari *et al*., 1988; Gertler and Gilchrist, 1994; and Ndikumana, 1999) emphasise that the increase in financial receipts due to investments in financial activities and financial assets could exert a positive influence on productive investments if (and when) NFCs channel these financial incomes to make real investments. Orhangazi (2008a and 2008b) recognise that this could be a more relevant mechanism in the case of small and medium corporations since they face higher financial constrains and are therefore forced to use all incomes (even financial) to undertake real investments. However, the financialisation literature does not support this mechanism but argues that these financial incomes are normally re-invested in other financial activities and financial assets.

The second channel is associated with the strong pressures on NFCs to increase their financial payments (interest, dividends and/or stocks buybacks) to the financial markets and the respective shareholders. This limits the funds available for real investments, which is commonly referred to as the "profit without investment" hypothesis (Cordonnier and Van de Velde, 2014). As noted by Aglietta and Breton (2001) and Duménil and Lévy (2004), the higher levels of payout ratios reduce the funds available for real investments made by NFCs, which has had a negative effect on the execution of long-term investment projects including activities like innovation, research and development. Hein (2012) and Hein and Dodig (2015) term this the "internal means of finance channel". Once again, the literature on financialisation presents several explanations for the low retention ratios of NFCs.

Firstly, Orhangazi (2008a and 2008b) focuses on the high levels of NFCs indebtedness, which lead to a rise in financial payments in the form of interest.

Secondly and regarding the financial payments through dividends, he notes that managers are encouraged to raise short-term payout ratios and in fact it is in their interest to do so as their remuneration is based on the short-term evolution of stock prices. Their strategy is therefore to distribute high dividends because this tends to drive a short-term increase in stock prices. On the other, this is simply a response to pressures from shareholders who, in some cases, are institutional investors that seek constant appreciations in stock value and high payout ratios. If NFCs do not make these financial payments in the form of dividends, their stocks could decline sharply as demand for them would fall and supply increase, which could ultimately lead to a takeover.

Thirdly, Lazonick and O'Sullivan (2000) and Stockhammer (2010) argue that this growing trend of financial payments by NFCs over the last three decades is

associated with a new design of corporate governance that favours the maximisation of shareholder value: the so-called "shareholder value orientation". Aglietta (2000) and van der Zwan (2014) notes that this has become "the norm of the transformation of capitalism" and is responsible for the dissemination of policies and practices that tend to favour shareholders over the other constituents of corporations. Lazonick and O'Sullivan (2000) suggest there has been a shift from "retain and reinvest" to a "downsize and distribute" strategy, namely a transfer from a strategy oriented to profit retention and reinvestment in corporations' growth to one of downsizing of corporate labour forces and the distribution of profits to shareholders. Levy-Orlik (2012) emphasises that investors' decisions based exclusively on the aim to maximise shareholder value target the reduction of production costs and rise in stock prices, to the detriment of employment, income equality, innovation and industrialisation.

Conversely and as referred by Orhangazi (2008a and 2008b), some authors claim that the increase in financial payments could be positive for NFCs' real investment on the grounds that higher levels of financial payments depend on higher profits and solvency. As such, these corporations will probably have access to more funding at lower costs, which could increase the implementation of new productive investments. However, this is not supported in the financialisation literature, which states that pressures to raise short-term financial payments are so strong and constant that NFCs cannot implement new real investments.

Despite the growing body of theoretical work on the effects of financialisation on real investment, there are few empirical studies on the subject, as emphasised by Onaran *et al*. (2011). Nevertheless, some empirical studies estimate investment functions for several countries in order to make an econometric analysis of financialisation's impact on real investment; most of these find it to be harmful[33].

Stockhammer (2004a) estimates an investment equation for Germany, France, UK and US, using a time series econometric analysis for each country individually. He uses interest and dividends received (the so-called rentier income) by NFCs to measure financialisation, and concludes that it has led to a deceleration in real investment, particularly in the US, France and UK. Orhangazi (2008a and 2008) also identifies the deleterious effect of financialisation in the US. He conducts a time series econometric

[33] As demonstrated by Onaran *et al.* (2011) there are also some theoretical and empirical studies on the effects of financialisation in the other components of the aggregate demand. Here, we focus only on investment.

analysis using aggregate data for NFCs as a whole and a panel data econometric analysis using micro data, analysing by sector (manufacturing versus non-manufacturing corporations), industry (durable versus non-durable producers) and dimension (small versus large corporations). In both studies, he applies financial profits (interest and dividends) and financial payments (interest, dividends and stock buybacks) to measure the two channels of financialisation. Van Treeck (2008) also performs a time series econometric analysis for the US for the period between 1965 and 2004. He concludes that interest and dividend payments exert a negative influence on long-term non-financial investment in the US. Onaran *et al*. (2011) estimate a simpler investment function, using a time series econometric analysis for the US from 1962 to 2007. They found evidence supporting the claims that financialisation (proxied by interest and dividends payments) has suppressed the level of investment. In our second Essay, we also performed a time series econometric analysis focused on Portugal from 1977 and 2013, using a VECM and financial receipts and financial profits of NFCs as proxies to capture financialisation. We concluded that financialisation has hurt real investment, mainly through financial payments and particularly in the long-term.

The literature has focused mainly on large and highly developed counties through time series econometric analyses for those countries. Here, we aim to make an empirical assessment of the relationship between financialisation and real investment of NFCs using a large set of countries, EU countries. To the best of our knowledge, this is the first Essay conducting a panel data econometric analysis for a group of countries over time. This approach will allow us to perceive if the prejudicial effects of financialisation have been generalised and transversal to this large set of countries or only affected specific countries from a macroeconomic view point[34].

3. Financialisation and Real Investment: An Economic Modelisation

Empirical studies of real investment are particularly difficult when they are carried out through econometric estimations of investment functions (Eisner, 1974). Effectively, *"[…] estimation of investment functions is a tricky and difficult business and the best posture for any of us in that game is one of humility"* (Eisner, 1974, p.

[34] From an econometric view point, the panel data econometric analysis has several other advantages over a simple time series econometric analysis, as pointed out by Baltagi (2005), Brooks (2008), among others.

101). In the same vein, Davidson (2000) emphasises that investment equations do not follow a stable functional expression over time, since investment decisions are constantly affected by exogenous "animal spirits" of investors.

Nevertheless, there are several empirical studies of real investment in the literature that reveal various determinants of investment decisions. Stockhammer (2004a) stresses the capacity utilisation, profitability and cost of capital as the main determinants of investment, while Orhangazi (2008a and 2008b) highlights real and financial variables, namely the level of profitability, output (or sales), cost of capital (or interest rates), degree of indebtedness and cash-flow (or the internal funds). Similarly, van Treeck (2008) states that the level of profitability and the business cycle are the main influencers of investment and Onaran *et al.* (2001) refers to output (that captures the accelerator effect) and the level of profitability (that indicates the availability of funds) as particularly influential.

In what follows, we estimate an equation where investment is a function of the prevalent variables in the explanation of investment decisions of investors in NFCs: profitability, level of debt, cost of capital, savings rate and output growth. Additionally, we incorporate two further variables (financial receipts and financial payments) to account for the two channels related with financialisation's prejudicial effects on productive investments, as described previously.

Accordingly, our investment function takes the following form:

$$I_{i,t} = \beta_0 + \beta_1 P_{i,t-1} + \beta_2 D_{i,t-1} + \beta_3 CC_{i,t-1} + \beta_4 SR_{i,t-1} + \\ + \beta_5 OG_{i,t-1} + \beta_6 FR_{i,t-1} + \beta_7 FP_{i,t-1} + \mu_{i,t} \quad \textbf{(7)}$$

, where i is the country, t is the time period (years), I is investment of NFCs of country i at time t, P is profitability of NFCs of country i at time t, D is the corporate debt of NFCs of country i at time t, CC is the cost of capital of country i at time t, SR is the savings rate of country i at time t, OG is the output growth of country i at time t, FR are financial receipts of NFCs of country i at time t and FP are financial payments of NFCs of country i at time t.

The two-way error term component is given by:

$$\mu_{i,t} = \eta_i + \lambda_t + \varepsilon_{i,t} \quad \textbf{(8)}$$

, where η_i accounts for unobservable country-specific effects and λ_t accounts for time-specific effects. The term $\varepsilon_{i,t}$ is the random disturbance in the regression, varying across countries and years.

We use lagged values for the independent variables because of the time lag between investment decisions and the respective capital expenditures (investment projects usually take over one year to be implemented, meaning that the decision to invest in t was based with information in $t-1$), the role on the formation of investors' expectations (adaptive expectations) and the need to avoid potential problems of simultaneity and reverse causation (i.e. endogeneity problems) (Orhangazi, 2008a and 2008b). On one hand, profits (where financial receipts and financial payments are included) of a certain year are only available for investments in the following year. On the other, investors only know the lagged values of output growth when they make investment decisions.

All NFCs variables (investment, profitability, debt, financial receipts and financial payments) are expressed as ratios of the respective gross value added (both the numerator and denominator are in volume). This permits the comparison of variables expressed in different currencies, making exchange rates unnecessary for conversion to the same currency that could skew results due to the respective movements on international financial markets. This also allows the respective coefficients to be interpreted in percentage points (p.p.).

It should be noted that we propose to estimate an aggregate investment function, similarly to Stockhammer (2004a), Orhangazi (2008a), van Treeck (2008) and Onaran *et al.* (2011). Stockhammer (2004a) emphasises that the respective results should be analysed with care as we are addressing a macroeconomic issue, i.e. the slowdown of real investment, although the theory of NFCs investment decisions is supported by microeconomic fundaments. This strategy implies the assumption of a representative corporation. In addition, we recognise some limitations to this approach since the use of an aggregate investment function does not reflect different financialisation levels among NFCs or the potential dissimilarities in the behaviour of NFCs from different countries, sectors, industries, dimensions and/or ownerships. Note also that as a panel data econometric analysis estimates an average effect of several countries, it does not account for the historical, social and economic circumstances responsible for real investment in each country. Here, we follow a macroeconomic perspective to assess

whether financialisation has been beneficial or prejudicial to real investment in the EU. Thus, if the two channels of financialisation are found to have a macroeconomic effect, we cannot determine whether it is due to the impact of some corporations/countries or is more generalised across all corporations/countries. If we do not find any macroeconomic effect, we cannot exclude that they affect a subset of corporations/countries, which however is not enough to create a macroeconomic effect in all countries.

Accordingly, profitability, savings rate and output growth are expected to exert a positive influence on investment, while cost of capital and the two variables of financialisation are expected to influence NFCs investment negatively. The level of debt could have a positive or a negative influence on investment. Thus, coefficients of these variables are expected to have the following signs:

$$\beta_1 > 0, \beta_2 \gtrless 0, \beta_3 < 0, \beta_4 > 0, \beta_5 > 0, \beta_6 < 0, \beta_7 < 0 \quad \textbf{(9)}$$

Profitability is expected to exert a positive influence on real investment, mirroring the demand conditions that are crucial to determine the viability of investment projects. Effectively and following a Keynesian argument, profitability tends to have a positive effect on real investment by functioning as a source of internal funds (Stockhammer, 2004a). Kopche and Braunman (2001) note that expectations for future demand conditions and future profitability have the strongest influence on investment. Nonetheless, Kuh and Meyer (1955) and Minsky (1975) state that given the uncertainty about the future it is the past demand conditions and past profitability rather than the expectations that are the major influencers of investment. This seems to prevent the anticipation of future demand conditions and future levels of profitably, in a context where these expectations are normally formed on the basis of past.

The debt level has an undetermined effect on investment (Orhangazi, 2008a and 2008b). A positive effect is expected when the debt level is perceived to be safe. Here, a rise in debt may have no effect or even a positive effect on investment by increasing the available funds. A negative effect occurs when the debt level is perceived to be unsafe, as it signals greater financial fragility and makes it more difficult to obtain further funding. In that situation, future profits may be insufficient to repay existing debt, increasing the probability of bankruptcy.

The cost of capital (normally measured by the level of real long-term interest rates) is expected to exert a negative effect on real investment, reflecting the funding costs or the respective opportunity costs.

In addition, real investment is expected to depend positively on the respective savings rate, because a higher savings rate tends to be associated with a higher level of funds in the hands of banks and/or international financial markets, which is determinant to their intermediation function and the provision of funding to corporations (by transferring savings from lenders to borrowers in credit or other forms of financing).

On the other hand, real investment also depends positively on the output growth. This follows the Keynesian argument of the accelerator principle that most investors exhibit a higher propensity to invest in periods of economic growth than during downturns. The accelerator principle postulates that an acceleration/deceleration of the GDP will accelerate/decelerate real investment even more, given a multiplier higher than one. Lopes (2003) confirms that real investment in the EU and the US is strongly procyclical[35] in relation to the respective business cycle. Indeed, Sørensen and Whitta-Jacobsen (2005) highlight the existence of two stylised facts of business cycles in relation to investment: investment is strongly positively correlated with the business cycle; and it is the most volatile component of aggregate demand.

Finally and as discussed in the previous Section, the two financialisation variables are expected to exert a negative influence on NFCs' real investment. On one hand, the rise in financial receipts tends to lower real investment as NFCs will use this income to make further investments in financial activities and/or in financial assets rather than to investment in real activities ("crowding out" effect). On the other, financial payments also tend to lower real investment because they reduce the funds available for these real investments.

4. Data and Methodology: The Econometric Framework

4.1. Data

In order to analyse the role of financialisation on real investment of EU countries, we collect annual data from 1995 and 2013 for a set of 27 countries (Austria,

[35] A procyclical behaviour of a certain variable means that there is a positive correlation between the fluctuations of this variable and the GDP (i. e., the business cycle).

Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and UK). Malta was the only EU country excluded, due to the lack of data. Table 20 shows the sample period and the number of observations and missing per country.

Table 20 – Sample composition

Country	Period	Observations	Missing
Austria	1995-2013	19	0
Belgium	1995-2013	19	0
Bulgaria	2002-2012	11	8
Cyprus	1997-2012	16	3
Czech Republic	1995-2013	19	0
Denmark	1995-2013	19	0
Estonia	1996-2012	17	2
Finland	1995-2012	18	1
France	1995-2013	19	0
Germany	1995-2013	19	0
Greece	2005-2012	8	11
Hungary	1995-2013	19	0
Ireland	2002-2013	12	7
Italy	1995-2013	19	0
Latvia	1997-2013	17	2
Lithuania	1999-2012	14	5
Luxembourg	2006-2012	7	12
Netherlands	1995-2013	19	0
Norway	1995-2012	18	1
Poland	1995-2012	18	1
Portugal	1995-2013	19	0
Romania	1995-2011	17	2
Slovakia	1995-2013	19	0
Slovenia	1998-2013	16	3
Spain	2000-2013	14	5
Sweden	1995-2013	19	0
UK	1995-2013	19	0

This is the period and the frequency for which all data are available and they are suitable for the study for two reasons. First, financialisation became more preponderant in the 1990s (van der Zwan, 2014); second, the investment by corporations is a long-term decision (it usually takes over a year to implement investment projects and recover the invested capital), and therefore annual data is likely to capture the determinants of real investment better than higher frequency data.

Thus, we construct a panel of data (or longitudinal data), since we collect data for a set of 27 cross-sectional units ($N = 27$) that were observed over time between 1995 and 2013 ($T = 19$). Nonetheless, we obtained an unbalanced panel data because it was impossible to collect data for all years for each country. We have 63 missing values and our sample is therefore composed of a total of 450 observations.

Table A10 in Appendix contains the descriptive statistics of the data and Table 21 presents the corresponding correlation matrix between all variables. The most important finding is that the absolute values of all correlations are lower than 0.8, which is crucial to exclude the existence of severe multicollinearity between the variables of our model (Studenmund, 2005). In addition, profitability and output growth are the only variables positively correlated with investment; indeed they are precisely the two variables expected to have a positive effect on investment. The variables of debt, cost of capital, financial receipts and financial payments are negatively correlated with investment, which could signal a negative effect on investment. This also seems to confirm our suspicion that financialisation has hampered real investment through the two aforementioned channels.

Table 21 – The correlation matrix between variables

	I	***P***	***D***	***CC***	***SR***	***OG***	***FR***	***FP***
I	1							
P	0.139***	1						
D	-0.531***	0.139***	1					
CC	-0.122***	-0.037	0.278***	1				
SR	-0.378***	-0.493***	-0.014	0.117**	1			
OG	0.313***	0.151***	-0.327***	-0.311***	-0.234***	1		
FR	-0.288***	-0.323***	-0.016	-0.077	0.316***	-0.174***	1	
FP	-0.364***	0.044	-0.102**	-0.014	0.316***	-0.177***	0.730***	1

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

Regarding the definition of the data, we used the gross fixed capital formation of NFCs divided by the respective gross value added to describe the NFCs' investment. The ratio between these two variables is usually known as the NFCs' investment rate.

We use the NFCs' gross operating surplus[36] divided by the respective gross value added as a proxy of profitability; the ratio between these two variables is commonly referred to as the profit share of NFCs.

The proxy of the debt level used here was the net lending/net borrowing[37] of NFCs divided by the respective gross value added.

[36] According to the Eurostat, "gross operating surplus can be defined in the context of national accounts as a balancing item in the generation of income account representing the excess amount of money generated by incorporated enterprises' operating activities after paying labour input costs. In other words, it is the capital available to financial and non-financial corporations which allows them to repay their creditors, to pay taxes and eventually to finance all or part of their investment".

[37] The net lending/net borrowing of NFCs is the difference between current savings (plus capital transfers) and the respective investment. According to the OECD, "it reflects the amount of financial assets that are available for lending or needed for borrowing to finance all expenditures – current, gross capital formation, non-produced non-financial assets, and capital transfers – in excess of disposable

Financial receipts correspond to the sum of interest and the distributed income of corporations[38] (where dividends are included) received by NFCs. We divided them by the gross value added of NFCs.

We use the sum of interest and the distributed income of corporations (where dividends are included) paid by NFCs as a proxy of financial payments. We also divided them by the gross value added of NFCs.

Note that the variables of gross fixed capital formation, gross value added, gross operating surplus, net lending/net borrowing, financial receipts and financial payments of NFCs were collected from the Annual Sector Accounts (at current prices and in millions of national currency), available at Eurostat. When not available on Eurostat, observations of these variables were completed with data from the national statistic offices of each country.

We use the long-term real interest rates (deflated by the GDP deflator) from AMECO database to measure the cost of capital of NFCs. For some countries, we also used the short-term real interest rates (deflated by the GDP deflator) for several years because in the case of some countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Slovakia and Slovenia) long-term real interest rates are only available for the most recent years[39]. We chose this strategy instead of using only the short-term real interest rates for all countries because investment is a long-term decision and is therefore more dependent on long-term interest rates than on short-term interest rates.

The savings rate variable corresponds to the gross savings of households as a percentage of the respective disposable income, available on AMECO database.

Finally, we apply the usual variable of GDP to describe the evolution of output growth. It was collected from the Eurostat (at current prices and in millions of national currency) and was deflated using the GDP deflator (2005=100), available on AMECO database. After that, we calculate the respective annual growth rate.

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income". As such, a country is net lender/net borrower when it exhibits positive/negative values of net lending/net borrowing.

[38] The distributed income of corporations includes dividends and withdrawals from the income of quasi-corporations (amounts that entrepreneurs withdraw for their own use from the profits earned by the quasi-corporations that belong to them).

[39] According to the AMECO database, the real interest rates are obtained by the difference between the nominal interest rates and the inflation rate measured by the GDP deflator.

4.2. Methodology

Our methodology involves four steps. Note that we assume the stationarity of our data for the following three reasons. First, plots of our eight variables (Figure A14 to Figure A21 in Appendix) already seem to indicate that all variables are stationary in levels. Second, our variables are in fact defined in ratios (in the case of investment, profitability, debt, savings rate, financial receipts and financial payments) or in growth rates (in the case of output growth); intuitively it is plausible to assume that these variables do not exhibit a unit root. Third, the traditional panel unit root tests have low power and perform very poorly in the presence of panels where the cross-sectional dimension N is higher than the period dimension T, as recognised by Baltagi (2005), Hlouskova and Wagner (2006), Cameron and Trivedi (2009), among others. These authors also emphasise that for small T, there is the potential risk of concluding that the whole panel in non-stationary even when the panel has a large proportion of stationary data, since the conventional panel unit root tests tend to assume that $T \to \infty$.

Therefore, we must first decide which is the best econometric panel technique to make our estimations. There are several analytical models, namely the Pooled Ordinary Least Squares, the Fixed-Effects (FE) and the Random-Effects (RE). We will perform the Breusch and Pagan Lagrangian Multiplier test and the Hausman (1978) specification test[40] to decide whether there are individual effects and if these effects are fixed or random.

Having done this, we will make some diagnostic tests to determine whether our panel suffers from problems such as heteroscedasticity, autocorrelation of the residuals and/or cross-sectional dependence, because these disturbances are usually present in most macroeconomic empirical applications and they tend to affect the performance of panel estimators, as recognised by Hoechle (2007), Reed and Ye (2011), among others. We will apply a period heteroscedasticity test and a cross-sectional heteroscedasticity test[41], based on Levene (1960) and Brown and Forsythe (1974). This test reports Levene's robust test statistic (W_0) for the equality of variances and the two statistics proposed by Brown and Forsythe (1974) that replace the mean in Levene's formula with the median (W_{50}) and with the 10% trimmed mean (W_{10}) because these two reformulations have been proved more robust in the presence of skewed populations.

[40] We apply, respectively, the "xttest0" and the "hausman" commands from Stata software.

[41] We follow the "robvar" instruction from Stata software.

We also apply a modified Wald statistic to test a group-wise heteroscedasticity[42], following Greene (2000). In addition, we perform the Wooldridge (2002) test for serial correlation[43]. Drukker (2003) emphasises that this test has good size and power properties even in reasonably sized samples. Finally, we conduct a cross-sectional dependence test[44], based on three different testing procedures: Friedman's (1937) test statistic, the statistic proposed by Frees (1995 and 2004) and the cross-sectional dependence test of Pesaran (2004). As noted by Hoyos and Sarafidis (2006), all these three procedures may be suitable if the panel's cross-sectional dimension N is higher than the period dimension T and the model is static.

The third step is the estimation of our model. As we will see in the next Section, our panel suffers from heteroscedasticity, autocorrelation of the residuals and cross-sectional dependence. Hoechle (2007) notes that three different estimators can be used to deal with this. Firstly, he presents the Feasible Generalised Least Squares (FGLS) proposed by Parks (1967), but stresses that it is not feasible if the panel's period dimension T is smaller than its cross-sectional dimension N and tends to produce unacceptably small standard error estimates. Secondly, he introduces the methodology proposed by Beck and Katz (1995), using Ordinary Least Squares coefficient estimates with Panel Corrected Standard Errors (PCSE). Nevertheless, he recognises that the finite sample properties of the PCSE estimator are quite poor when the panel's cross-sectional dimension N is higher than the period dimension T. Thirdly, he presents the Driscoll and Kraay (1998) estimator, emphasising that it applies a Newey-West type correction to the sequence of cross-sectional averages of the moment conditions. He states this estimator is suitable for both balanced and unbalanced panels and consistent when the panel's cross-sectional dimension N is higher than the period dimension T, which is our case. Therefore, we will use this estimator for our investment function[45].

Finally, we analyse the estimations of our investment equation for EU countries and make a simple robustness analysis in order to assess whether the results exhibit

[42] We use the "xttest3" command from Stata software.

[43] We apply the "xtserial" instruction from Stata software.

[44] As we have a panel where the cross-sectional dimension N is higher than the period dimension T, we cannot perform the traditional Lagrange Multiplier test, developed by Breusch and Pagan (1980) and following Greene (2000), through the command "xttest2" in Stata software. We therefore use the "xtcsd" command from Stata software.

[45] We follow the "xtscc" instruction from Stata software. Note that this estimator performs a Pooled Ordinary Least Squares with Driscoll and Kraay standard errors.

some sensitivity to other specifications, namely distinguishing between receipts and payments of interest and dividends, and differentiating between the more and the less financialised countries.

5. Empirical Results and Discussion

First, we need to address the correct model specification to determine whether there are individual effects in our panel, i.e. country-specific effects that differentiate each country, are not observed and do not change over time. These individual effects can be either fixed or random. We apply the Breusch and Pagan Lagrangian Multiplier test and the Hausman test and the respective results are presented in Table 22. In relation to the LM test, we strongly reject the null hypothesis that variances across countries are zero. So we have evidence that there are significant differences across countries, i.e. there are individual effects. Regarding the Hausman test, we cannot reject the null hypothesis that the RE model is preferable to the FE model. We therefore conclude that the RE model is the best econometric specification for our panel.

Table 22 – The Breusch and Pagan Lagrangian Multiplier (LM) test and the Hausman test

Test	Chi-square	*P-value*
LM test	990.76	0.000
Hausman test	4.89	0.674

We then conduct a set of diagnostic tests to assess whether our RE model suffers from any disturbance. We apply five different tests and the respective results are presented in Table 23. In relation to the period and the cross-sectional heteroscedasticity tests, we reject the null hypothesis that the variances are equal (homocedasticity), concluding that our panel suffers from heterocedasticity. Note that we cannot perform the group-wise heteroscedasticity test because it is not available for the RE models. For the serial correlation test, the null hypothesis of no serial correlation is clearly rejected and it is concluded that our panel suffers from autocorrelation of the residuals. Finally and regarding the cross-sectional dependence, the null hypothesis of cross-sectional independence cannot be rejected by the Friedman test. However, the null hypothesis of cross-sectional independence is rejected by Frees test and Pesaran test. Therefore, we will assume the existence of cross-sectional dependence in our panel as this is the result of two of the three tests performed.

Table 23 – Diagnostic tests for the RE model

Test		Statistic	*P-value*
Period Heteroscedasticity	W_0	3.071	0.000
	W_{50}	2.343	0.002
	W_{10}	2.873	0.000
Cross-sectional Heteroscedasticity	W_0	8.050	0.000
	W_{50}	5.577	0.000
	W_{10}	7.311	0.000
Group-wise Heteroscedasticity		n. a.	n. a.
Serial Correlation		46,374	0,000
Cross-sectional Dependence	**Friedman**	25.741	0.477
	Frees	1.566	n. a.
	Pesaran	6.778	0.000

Note: The critical values from Frees' Q distribution (T-asymptotically distributed) are 0.489, 0.686 and 1.105 to the significance levels of 10%, 5% and 1%, respectively

We then proceed with the estimation of our investment function. As our panel suffers from heteroscedasticity, serial correlation of the respective residuals and cross-sectional dependence, we use the Driscoll and Kraay (1998) estimator and the respective results are in Table 24.

Table 24 – Estimations of the investment function

Variable	Coefficient	*Standard Error*	T-statistic
P_{t-1}	0.279***	0.060	4.69
D_{t-1}	-0.447***	0.071	-6.27
CC_{t-1}	0.109	0.091	1.20
SR_{t-1}	-0.150*	0.077	-1.95
OG_{t-1}	0.099	0.076	1.31
FR_{t-1}	0.252***	0.049	5.11
FP_{t-1}	-0.475***	0.056	-8.47
β_0	0.206***	0.024	8.75
Observations: 423; **Groups:** 27; **F-statistic** = 191.83***; $\mathbf{R^2}$ = 0.554			

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

All variables are statistically significant at the conventional significance levels, with the exception of cost of capital and output growth. Even so, the variable of output growth has the expected positive sign, partially confirming that investors are more willing to invest in periods of economic growth and that investment is procyclical in relation to the business cycle. However, the respective coefficient is less than one, which does not confirm the accelerator principle. On the other hand, all coefficients of the statistically significant variables have the expected signals, with the exception of savings rate and financial receipts. Indeed, NFCs' investment is positively influenced by the level of profitability, which may suggest that profits are used to finance real investments. Alternatively, a higher profitability rate may indicate that future projects will be more profitable and thus induces more investment. A 1 p.p. increase in profitability raises investment by about 0.3 p.p.. The debt level exerts a negative

influence on the NFCs' investment: a 1 p.p. increase in the level of debt reduces real investment by around 0.45 p.p.. This indicates that the debt level of NFCs has reached an unsafe level, making it more difficult to obtain further funding. This also suggests that debt is being used to repay existing debts rather than to fund new investments. The real investment of NFCs also depends negatively on the savings rate: a 1 p.p. increase in the savings rate lowers investment by about 0.2 p.p.. This (unexpected) negative coefficient of the savings rate could have two different explanations. First, it could indicate that banks in EU countries are not so dependent on household savings to guarantee their intermediation function, namely because they have access to other forms of financing (e.g. foreign financing). Second, it could be associated simply with the negative relationship between savings and consumption. In fact, a higher level of savings involves lower consumption by households, which can slow down the new investments made by corporations. Financial receipts exert a positive influence on real investment, contrary to the claims of the literature on financialisation. A 1 p.p. rise in financial receipts raises investment by about 0.3 p.p.. This seems to exclude the "crowding out" assumption. This positive relationship reveals that financial investments have not been detrimental to real investments, probably because NFCs use financial returns to finance real investments. Finally, real investment is negatively influenced by financial payments in line with the literature on financialisation. A 1 p.p. increase in financial payments reduces investment by about 0.5 p.p..

To obtain a better understanding of the effects of financialisation on NFCs' real investment in EU countries, we also re-estimate the investment function equation, splitting financial receipts into interest and dividends receipts (IR and DR, respectively) and dividing financial payments into interest and dividends payments (IP and DP, respectively). Once again, the RE model proved to be the best econometric specification to estimate the investment function, according to the Breusch and Pagan Lagrangian Multiplier test and the Hausman test (Table A11 in Appendix). We maintain the Driscoll and Kraay (1998) estimator because our investment function defined in this particular way continues to suffer from heteroscedasticity, serial correlation of the respective residuals and cross-sectional dependence (Table A12 in Appendix). The respective results are presented in Table 25.

Overall, the results do not change dramatically. In fact, all variables remain statistically significant at the traditional significance levels, with the exception of cost of capital. At the same time, the level of profitability continues to influence investment

positively and the debt level and savings rate also exerts a negative influence on NFCs' real investment. Here, the most important change is related with the output growth variable, which becomes statistically significant and continues to influence investment positively, reinforcing the procyclical nature of investment. Similarly, financial payments continue to exert a negative influence on real investment, not only through interest payments but also through dividends. This shows us that the debt service and the paradigm of "shareholder value orientation" have been simultaneously detrimental to NFCs' real investment in the EU. Nevertheless, the "shareholder value orientation" seems to be more harmful for real investment, given the lower coefficient of dividends payments in relation to the coefficient of interest payments. However, we conduct a simple Wald test to determine whether the two coefficients are statistically equal (Table A13 in Appendix). We cannot reject the null hypothesis and conclude that they are statistically equal. The channel of financial receipts exhibits mixed results. Indeed, interest receipts are a negative determinant to real investment but cease to have statistical significance. This seems to give a tenuous indication that the returns of financial investments in debt securities are being used to finance further financial activities or financial investments, confirming the hypothesis of the "crowding out" effect. Nevertheless, dividends receipts remain statistically significant and maintain a positive sign, strengthening the claims that NFCs in EU countries could be using their financial returns from shares to make new real investments.

Table 25 – Estimations of the investment function with financial receipts and financial payments divided between interest and dividends

Variable	Coefficient	*Standard Error*	T-statistic
P_{t-1}	0.296***	0.056	5.29
D_{t-1}	-0.454***	0.072	-6.30
CC_{t-1}	0.132	0.080	1.64
SR_{t-1}	-0.132*	0.070	-1.88
OG_{t-1}	0.109*	0.059	1.84
IR_{t-1}	-0.087	0.202	-0.43
DR_{t-1}	0.395***	0.077	5.13
IP_{t-1}	-0.470***	0.117	-4.02
DP_{t-1}	-0.507***	0.059	-8.60
β_0	0.206***	0.022	9.35
Observations: 423; **Groups:** 27; **F-statistic** = 156.39***; $\mathbf{R^2}$ = 0.564			

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

Our next aim is to discover whether financialisation has affected both more financialised and less financialised countries in the same manner and/or degree. We re-estimate our aggregate investment function, adding two dummy variables for the more

financialised countries in terms of financial receipts and financial payments (*DFR* and *DFP*, respectively). We calculated the average of financial receipts and financial payments for each country during the period for which both variables are available (Table A14 in Appendix). After, we split the different countries into those with more and fewer financial receipts and those with more and fewer financial payments, respectively, in relation to the overall average of all countries (Table A15 in Appendix). The more financialised countries in terms of financial receipts and financial payments take the value one in the dummy variables *DFR* and *DFP*, respectively[46]. These two dummies are then multiplied by the two respective financialisation variables in order to determine whether there is a relationship between investment and the extent of the countries' financialisation.

Here, the FE model seem to be the best econometric specification to estimate our investment function defined in this manner, according to the the Breusch and Pagan Lagrangian Multiplier test and the Hausman test (Table A16 in Appendix). However, we maintain the Driscoll and Kraay (1998) estimator because our investment function defined in this particular specification continues to suffer from heteroscedasticity, serial correlation of the respective residuals and cross-sectional dependence (Table A17 in Appendix). The respective results are presented in Table 26.

Table 26 – Estimations of the investment function with two dummies for the countries that exhibit higher levels of financial receipts and higher levels of financial payments

Variable	Coefficient	*Standard Error*	T-statistic
P_{t-1}	0.298***	0.043	6.86
D_{t-1}	-0.436***	0.073	-6.02
CC_{t-1}	0.109	0.094	1.15
SR_{t-1}	-0.144*	0.074	-1.95
OG_{t-1}	0.128	0.092	1.40
FR_{t-1}	0.358*	0.183	1.95
$DFR*FR_{t-1}$	-0.090	0.148	-0.61
FP_{t-1}	-0.410***	0.053	-7.70
$DFP*FP_{t-1}$	-0.052**	0.019	-2.79
β_0	0.185***	0.016	11.69
Observations: 423; **Groups:** 27; **F-statistic** = 405.34***; $\mathbf{R^2}$ = 0.560			

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

On aggregate, the results are quite similar. Once again, all variables are statistically significant at the traditional significance levels with the exception of cost of

[46] Note that *DFR* takes the value 1 for Belgium, Cyprus, Denmark, Finland, France, Hungary, Luxembourg, Netherlands, Norway and Sweden; and the value 0 for the remaining countries. *DFP* takes the value 1 for Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway and Sweden; and the value 0 for the remaining countries.

capital and output growth. In the same fashion, the profitability level remains a positive determinant of NFCs' real investment, whilst the debt level and the savings rate maintain their negative influence on real investment. The variables linked with financialisation also suffer no significant changes. Financial receipts continue to influence real investment positively, strengthening our argument that financial investments made by NFCs are not diverting substantial funds from real investments. Instead, these financial incomes seem to be used as a source of funding for new investment. Financial payments maintain their negative coefficient, confirming that lower retention ratios are disruptive for NFCs' real investment. The most important findings are related with the dummies variables, which are negative in both cases (albeit statistically insignificant in the case of financial receipts). This seems to illustrate that real investment in more financialised countries is more adversely affected than in less financialised countries.

In conclusion, we find evidence supporting the claim that financialisation has hurt NFCs' real investment in EU countries, mainly due to the channel involving the strong pressures on NFCs to increase their payments to shareholders in the form of interest and dividends. We are also able to identify that the prejudicial effects of financialisation are worse in the more financialised countries. Another important conclusion is that there is a disruptive relationship between debt and real investment, which suggests that NFCs in EU countries use new debts to repay existing debts rather than to implement new productive investments.

6. Conclusion

This Essay aimed to determine whether financialisation has beneficial or prejudicial effects on real investment in EU countries by conducting a panel data econometric analysis for 27 EU countries from 1995 and 2013, using macroeconomic annual data.

As opposed to mainstream economics, the literature on financialisation refers to two channels through which the increasing importance of finance could be disruptive to the real investment of NFCs. Firstly, the rise of in financial investments made by NFCs deviates funds from productive investments, causing a type of "crowding out" effect on real investment. Secondly, the funds available to support real investments have

decreased due to the strong pressure from shareholders on NFCs for financial payments in the form of interest, dividends and/or stock buybacks.

We estimate an investment equation to describe real investment using macroeconomic annual data and making use of the standard variables (profitability, debt, cost of capital, savings rate and output growth) and two other variables to reflect the two channels of financialisation (financial receipts and financial payments).

We conclude that the RE model is the best econometric specification and that our panel suffers from heteroscedasticity, autocorrelation of the residuals and cross-sectional dependence. Therefore, we estimated our investment equation using the Driscoll and Kraay estimator. We identified financial payments as a negative determinant of real investment in EU countries, in accordance with the predictions of the literature on financialisation. Both interest and dividend payments negatively influence real investment. Nevertheless, financial receipts of dividends exert a positive impact on real investment, in contradiction with the literature on financialisation. This seems to illustrate that NFCs in EU countries are using financial incomes to fund real investments, which excludes the "crowding effect". We also conclude that the prejudicial effects of the financialisation on real investment are worse in the more financialised countries. This reveals that there is a tendency for the investment rate of a country to be (inversely) related with the degree of financialisation. Future research should extend the analysis to sustain the validity of this assumption, namely through the use of other broader and more complex indicators to distinguish between more and less financialised countries. We also find that debt exerts a negative influence on real investment, which suggests that the NFCs' indebtedness reaches unsafe levels by limiting the possibility to obtain further funding to finance productive investments. Another possible extension of this work is the use of different measures to capture the two channels of financialisation. The proportion of financial assets to total assets of NFCs and the level of payout ratios of NFCs appear to be two interesting alternatives.

Our findings suggest that the prejudicial effects of financialisation on real investment are not peculiar to the most developed and financialised economies, such as US and UK. Instead, it seems to be a generalised phenomenon that negatively affects most EU countries, albeit with different intensities in accordance with the level of financialisation.

V. Functional Income Distribution in a Small European Country: The Role of Financialisation and Other Determinants[47]

1. Introduction

Conventional economic theory argues that factors' shares (labour income share and profit share) 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, 2011; 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, 2011), 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).

In the literature on financialisation, Hein (2012), Hein and Detzer (2014), Michell (2014), Hein and Dodig (2015), among others, stress that the financialisation increases income inequality through three channels (and various sub-channels). These three channels are associated with 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 Essay aims to evaluate the impact of financialisation on the functional income distribution in Portugal between 1978 and 2012. It should be noted that in this Essay we refer to unequal distribution of national income among different agents in a

[47] This Essay is already published in Working Paper Series of Dinâmia'CET-IUL and it was already submitted to *Society and Economy*.

society according with the property of production factors (Czaplicki and Wieprzowski, 2013), and so inequality increases when the profit share increases and the labour income share decreases.

As illustrated by Figure A22 in Appendix, Portugal is not an exception to this global trend of a 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 Portuguese 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 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 economy. 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 aim is to assess whether financialisation played a role in the evolution of the labour income share just described.

The Essay contributes to the literature in two ways. First, whereas most studies address large, developed and highly financialised economies, this Essay focuses on Portugal which has a less financialised economy. Second, the Essay 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 US or the UK and it is characterised by the dominance of banks. The vast majority of corporations 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 NFCs 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 Chapter 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 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. Therefore, this is a topic that always received a strong interest by economists. In fact, "*to determine the laws which regulate this distribution [between rents, profits and wages], is the principal problem in Political Economy*" (Ricardo, 1817, p. 5).

More recently and in a context of liberalisation, deregulation, globalisation and financialisation, main attentions are centred in the conflict between corporations and shareholders against wage earners (Dünhaupt, 2013a). The shares of rents, profits and

wages provides an indication of the relative power of different groups in a certain society (Atkinson, 2009).

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 of income inequality. Note that the concept of inequality of income distribution discussed here refers to the unequal distribution of income resulting from the production among different agents in a society according with the property production factors (Czaplicki and Wieprzowski, 2013). Dünhaupt (2013b) stresses that the functional income distribution reveals the way how output is divided between the different factors of production, i. e. labour and capital. Thus, the labour income share and the profit share refer to the fraction of national income that goes to labour and capital, respectively.

The main trend in functional income distribution is the growing importance of profit share (including retained profits, interest payments and dividends), with the correspondent fall in the labour income share (wages), as well as the increasing inequality of wages and salaries between the top management and blue collar workers (Hein, 2009; and Lin and Tomaskovic-Devey, 2013). These trends have been transversal to the majority of advanced economies since the early 1980s, as admitted by Stockhammer (2009 and 2012), Kristal (2010), Dünhaupt (2011), Peralta and Escalonilla (2011), Estrada and Valdeolivas (2012), Hein (2013), Lin and Tomaskovic-Devey (2013), Michell (2014), among others.

The fall in labour income share may have different consequences. It could exacerbate the emergence of social strains (Dünhaupt, 2011). In addition, the decline of the labour income share could originate a reduction in aggregate demand in the medium and long-term, insofar as the economic growth in most OECD countries is characterized by a "wage-led" model instead of a "profit led" model, as advocated by Naastepaad and Storm (2007), Hein and Vogel (2008) and Dünhaupt (2013a). Stockhammer (2012) also stresses that wage are normally related with higher consumption propensities than profit incomes and therefore generate greater aggregate demand. At the same time,

Karanassou and Sala (2013) still advocates that the fall in the labour income share has also been responsible by a rise in personal income inequality.

According to the Kaleckian perspective[48], Hein (2012), Hein and Detzer (2014), Michell (2014), Hein and Dodig (2015), among others, claim that financialisation has led to an increase in functional income inequality, through three different channels (and various sub-channels) (Figure 21).

Figure 21 – The effects of financialisation on inequality of functional income distribution

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 one through which financialisation can affect labour income 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 traditionally smaller than in the non-financial sector. In this regard, Kus (2012) adds that the expansion of finance has shrunk the profitability of the non-financial sector in recent decades, which in turn have 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.

[48] 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.

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 corporations have a smaller profit share than private corporations. The reduction of government activity (either directly or through public corporations) 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 corporations, 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, 2011; Hein, 2012; Kus, 2012; van der Zwan, 2014; Hein and Dodig, 2015; among others). The reduction in wages is also related with the "neoliberal paradox", according to which shareholders force corporations 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) 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 corporations 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, corporations 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 policies 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, 2004b).

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 corporations to low-cost economies and their replacement with service sector corporations (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 NFCs, 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.

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., the 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 (2011 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[49]. 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 US, 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 US 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 corporation 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

[49] Note that there are still empirical studies assessing the role of financialisation on personal income distribution, as demonstrated by Assa (2012), Kus (2012), Czaplicki and Wieprzowski (2013) and Karanassou and Sala (2013). These studies use the traditional measure of Gini coefficient as dependent variable, concluding that the process of financialisation has had a significant negative impact on equality levels. Here, we are only focusing on functional income distribution.

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 GDP) had a negative effect on the growth in real wages in the EU15 economies between 1960 and 2010. Dünhaupt (2013a) estimates a wage share equation for thirteen OECD countries between 1996 and 2007, concluding that there is a relationship between the decline in the wage share and the increasing dividends and interest payments of NFCs, 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 corporation 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 a corporation-level. More recently, Alvarez (2015) conducted a panel data analysis for French NFCs 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 NFCs. 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 a time series econometric analysis to make an empirical assessment 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, notable there was not a clear upward trend in financial activity (Figure A27 in Appendix) or in financial payments by NFCs (Figure A29 in Appendix), neither a clear

downward trend in government activity (Figure A28 in Appendix). However, the importance of trade unions declined sharply since the 1980s (Figure A30 in Appendix) in line with the characteristics of an increasingly financialised economy.

3. Financialisation and Inequality in 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 NFCs, and the third is measured by the strength of trade unions.

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

$$LS_t = \beta_0 + \beta_1 TP_t + \beta_2 GL_t + \beta_3 ED_t + \beta_4 BC_t + \beta_5 FA_t + \beta_6 GA_t + \beta_7 SO_t + \beta_8 TU_t + \eta_t \quad \textbf{(10)}$$

, 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 corporations (taking into account their size or ownership). This implies that we are not able to analysis whether financialisation has affected more intensively some groups of corporations, as for instance the larger corporations or corporations quoted in stock markets. Yet, the advantage of the

macroeconomic 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 corporations. 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 corporations being affected, albeit not sufficiently to generate a macroeconomic effect.

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:

$$\beta_1 < 0, \beta_2 < 0, \beta_3 > 0, \beta_4 \gtrless 0, \beta_5 < 0, \beta_6 > 0, \beta_7 < 0, \beta_8 > 0 \quad \textbf{(11)}$$

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[50] behaviour of the labour income share: wages are sluggish; corporations 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 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

[50] A countercyclical behaviour of a certain variable means that there is a negative correlation between the fluctuations of this variable and the GDP (i. e., the business cycle).

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[51] of the total economy as a percentage of the GDP from AMECO database. The adjusted labour share corresponds to the ratio between the compensation per employee and the GDP 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).

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 GDP at current market prices - variables collected from the Portuguese National Accounts (at current prices and in million of euros) [52], available at *Instituto Nacional de Estatística*.

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 GDP at 2005 market prices (as a percentage of GDP), 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)

[51] Note that this measure of labour income 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).

[52] 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.

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 GDP at current market prices from AMECO.

The proxy for corporations' shareholder orientation is the sum of interest and distributed income of corporations (where dividends are included) paid by NFCs divided by the gross value added of these corporations. These variables were obtained from the Annual Sector 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[53].

Table A18 and Table A19 in Appendix contain the 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 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 ADF test and the 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.

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

[53] 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.

lagged values of the independent variables. An ARDL $(p, q_1, q_2, ..., q_k)$ can be represented by (Pesaran and Pesaran, 2009):

$$\phi(L,p)y_t = \sum_{i=1}^{k} \beta_i(L,q_i)x_{it} + \delta' w_t + u_t \quad \textbf{(12)}$$

, where:

$$\phi(L,p) = 1 - \phi_1 L - \phi_2 L^2 - ... - \phi_p L^p \quad \textbf{(13)}$$

$$\beta_i(L,q_i) = \beta_{i0} + \beta_{i1} L + ... + \beta_{iq_i} L^{q_i}, i = 1,2,...k \quad \textbf{(14)}$$

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:

$$\Delta y_t = -\phi(1,\hat{p})EC_{t-1} + \sum_{i=1}^{k} \beta_{i0} \Delta x_{it} + \delta' \Delta w_t - \sum_{j=1}^{\hat{p}-1} \phi_j^* \Delta y_{t-j} - \sum_{i=1}^{k} \sum_{j=1}^{\hat{q}_i - 1} \beta_{ij}^* \Delta x_{i,t-j} + u_t \quad \textbf{(15)}$$

, where EC_t is the error correction term defined by:

$$EC_t = y_t - \sum_{i=1}^{k} \hat{\theta}_i x_{it} - \hat{\psi}' w_t \quad \textbf{(16)}$$

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, 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 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 CUSUM and the 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 A22 to Figure A30 in 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 27 and Table 28, 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 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 27 – *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 28 – *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: * points 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) (Table A20 in Appendix). Information criteria do not agree on the optimal lag; some indicate an optimal lag of two and others one (Table 29). 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.

Table 29 – 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. The respective results are presented in Table 30. 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 values, which means that the null hypothesis of no cointegration can be rejected at the traditional significance levels. There is therefore evidence supporting the existence of a cointegration relationship between these variables.

Table 30 – Bounds test for cointegration analysis (short version)

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
6.504	1%	3.516	4.781
	5%	2.649	3.805
	10%	2.262	3.367

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 five

After, we conduct four diagnostic tests to assess the adequacy of this model (Table 31). The model does not shows 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 A31 and Figure A32 in 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. The long-term

relationship between labour income share and the remaining variables can be found in Table 32, whilst the short-term is presented in Table 33.

Table 31 – 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. Nonetheless, financial activity and government activity that 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 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 NFCs 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 32 – 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
Observations: 33 (1980-2012)			

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

In the short-term, 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 NFCs, 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 corporations attribute bonuses to workers based on their annual profits, and therefore high profits are associated with high dividends and bonuses (included in wages).

Table 33 – 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
Observations: 33 (1980-2012); $\mathbf{R^2}$ = 0.693; $R^2_{adjusted}$ = 0.591; **F-statistic** = 9.039***; **Log Likelihood** = 107.316			

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, 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 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 most information criteria as well as from FPE and AIC, which we have already indicated are the best choices for small samples.

There continues to be evidence of a cointegration relationship, as the computed F-statistic of 4.892 remains higher than the upper bound critical values (Table 35).

Table 34 – Values of the information criteria by lag (long version)

Lag	LR	FPE	AIC	SC	HQ
0	n. a.	1.47e-29	-40.8	-40.4	-40.7
1	383.0	1.40e-34	-52.6	-48.5*	-51.2
2	118.4*	1.43e-35*	-56.1*	-48.4	-53.5*

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

Table 35 – Bounds test for cointegration analysis (long version)

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
4.892	1%	2.716	3.989
	5%	2.163	3.349
	10%	1.899	2.964

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

The diagnostic tests in Table 36 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 (Figure A33 and Figure A34 in Appendix). 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 36 – 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 37 exhibits the long-term relationship between the labour income share and other eight variables, whilst Table 38 presents the short-term relationship. In the long-term, 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 NFCs in Portugal as demonstrated by Figure A29 in Appendix. Moreover, in our third Essay we

confirm that financial payments of Portuguese NFCs are below the European average. This is probably due to Portugal's "bank-based (or dominated) financial system" (Orsi and Solari, 2010), which may mean NFCs 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 corporations 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 37 – 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
Observations: 33 (1980-2012)			

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. As expected, globalisation still has a negative influence on the labour income 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 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 (Table A21 in Appendix); we cannot reject the null hypothesis, 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 38 – 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

Observations: 33 (1980-2012); $\mathbf{R^2}$ = 0.934; $R^2_{adjusted}$ = 0.809; **F-statistic** = 11.183***; **Log Likelihood** = 103.76

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

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 (Table A22 in Appendix) and the model maintains its stability and converges to the long-term equilibrium, albeit the error correction term would be around the threshold of -2 (Table A24 in Appendix). 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 (Table A23 in Appendix).

Similarly, the results are also quite similar if we choose the variable of net financial payments of NFCs (i.e. the difference between financial payments and financial receipts) instead of just financial payments. The existence of cointegration was confirmed (Table A25 in Appendix) and the model is stable and converges to the long-term (Table A27 in Appendix). Once again, the most important change is that the technological progress variable is statistically significant in the long-term with the expected negative sign (Table A26 in Appendix).

Additionally and since the indebtedness of NFCs is a distinctive feature of the financialisation process in Portugal (Lagoa *et al*., 2014), we re-estimated the long version of the labour income share replacing the variable of shareholder orientation with a variable of NFCs' indebtedness[54]. Overall, the results do not change significantly. The variables are also cointegrated (Table A28 in Appendix) and the variable of NFCs' indebtedness is positively related with the labour income share in the long-term (Table A29 in Appendix), suggesting that debt was used to improve the economic situation of corporations in the long-term with a positive effect on wages. However and given the nature of the variable chosen to capture NFCs' indebtedness, this result seems to suggest that NFCs could be using credits to pay wages. This model maintains its stability and convergence to the long-term equilibrium (Table A30 in Appendix).

IMF's intervention in Portugal in 1978-79 entailed a significant decline in the labour income share (Figure A22 in Appendix). 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 (Table A32 in Appendix). Once again, there is a cointegration relationship (Table A31 in Appendix) and the model maintains its stability and convergence to the long-term equilibrium (Table A33 in Appendix).

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 A26 in 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 5%

[54] This variable corresponds to the banking credit to NFCs over GDP from Bank of Portugal.

significance level (Table A34 in Appendix), the model is stable and converges to the long-term equilibrium (Table A36 in Appendix) and results are quite similar (Table A35 in Appendix). 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.

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 Essay 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 the 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 US and the UK, but also of a much smaller, less developed, less financialised and more peripheral economy like Portugal.

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

VI. Conclusion

1. Summary of the Thesis: General Conclusions

This PhD thesis aimed to evaluate the nature, the peculiarities and the impacts regarding the financialisation process in the Portuguese economy since the 1980s, insofar as the majority of theoretical and empirical literature is focused on the economies of the centre (and especially on the US and the UK) and tends to neglect the patterns in more peripheral economies.

In order to fulfil this purpose, we collected four Essays. Each one constituted a different Chapter of this PhD thesis. All of them aimed at contributing to a best understanding of the financialisation process and its consequences on the Portuguese and European economies since the 1980s.

Against this backdrop, the first Essay offered a broad picture of the phenomenon of financialisation in Portugal, namely its origins, its general evidences and its role and importance on the recent sovereign debt crisis.

The emergence of that phenomenon in Portugal was similar to what happened in other economies, albeit occurring relatively later when compared with these economies. The Portuguese financial sector was marked by a certain financial repression until the end of 1980s, mainly due the nationalisation of the banking system in the aftermath of the 25th of April Carnation Revolution and of the two agreements established with the IMF in 1977 and 1983. Only after the adhesion of Portugal to the EU in 1986 it were implemented a set of measures in order to liberalise and deregulate the functioning of the financial system. These measures involved the privatisation of the banking and insurance systems, the removal of barriers to the entry of new foreign financial institutions and the elimination of restrictions on interest rates, credit growth and number and location of branches. These measures fed financial development, characterised by a "bank-based (or dominated) financial system", and paved the way to the development of financialisation in the 1990s.

This Essay finds several evidences of financialisation in Portugal, as for instance the increasing importance of the financial sector in terms of value added, the expressive rise of financial assets owned by the economic agents, the higher involvement of NFCs in financial activities, the strong growth of credit especially to households and to non-tradable sectors and the concomitant indebtedness of the private sector. These last two

features supported a strong dynamism of the Portuguese economy until the turn of the millennium, particularly boosted by the robustness of private consumption, in accordance with a "debt-led consumption boom" model in the era of financialisation.

Nevertheless, in the last decade, the Portuguese economy started to lose momentum, due to the emergence of structural weaknesses paved in the era of financialisation in the previous decades. The levels of indebtedness reached unsustainable levels and the Portuguese economy faced structural problems, such as the low levels of education of the labour force, the predominance of industries with low value added and highly exposed to competition from Eastern European and emerging economies and its peripheral position relative to the main European and world markets. In addition, the adhesion to the EA imposed rigidity on the response of policy makers to adverse economic shocks by preventing exchange rate devaluations and by limiting expansionary fiscal and budgetary policies.

Thus and after the Great Recession, this slow structural economic growth accompanied by a counter-cyclical fiscal policy and an increase in risk aversion of international investors, caused a fast and large worsening of the Portuguese funding conditions in international financial markets. The Portuguese government was forced to request financial assistance from Troika, who imposed a demanding austerity program without solving the structural weaknesses of the Portuguese economy.

Against this backdrop, this Essay concludes that the financialisation process also occurs in a smaller, more peripheral and less developed economies, also showing that this process makes economies more prone to financial and economic crises.

The second Essay conducted a time series econometric analysis in order to address the relationship between the financialisation process and the Portuguese real investment. The literature of financialisation supports a disruptive relationship between financialisation and real investments, namely because NFCs have denoted a higher preference for financial investments and are pressed by shareholders to increase their financial payments. All in all, these two features decrease funds available to the materialisation of real and productive investments.

Accordingly, we estimated an investment equation including the conventional variables (profitability, debt, cost of capital, savings rate and business cycle) and two variables linked with the financialisation process (financial receipts and financial payments). We use aggregate macroeconomic data from 1977 to 2013.

The Essay estimated a VECM, insofar as all variables are integrated of order one and they are cointegrated. In the long-term, we found that financial payments exert a negative impact on the Portuguese real investment in line with the claims of the literature on financialisation. Financial receipts exert a positive effect on real investment, contrary to the predictions of the literature. However, this could be the result that the large majority of corporations in Portugal are small and medium. In fact, these corporations face more financial constraints, being forced to use all available funding (even from financial investments) to finance real investments. In the short-term, both variables of financialisation are not statistically significant. Another important finding is related with debt, which influences negatively real investment both in the long-term and in the short-term. This negative relationship between debt and real investment seems to suggest the unsustainable levels of indebtedness of the Portuguese NFCs, in a context where new debts may be used to repay existing debts rather than to finance new investments.

The third Essay performed a panel data econometric analysis in order to analyse the relationship between the financialisation process and real investment in the EU countries from 1995 to 2013. We use the same investment function derived in the second Essay. Here, the main goal is to address the effects of the financialisation process in a large set of counties by exploring a larger number of observations and a higher level of sample variability, which tend to improve the accuracy of results.

The Essay used the Driscoll and Kraay estimator, since panel suffered from heteroscedasticity, autocorrelation of residuals and cross-sectional dependence. Financial payments continue to exert a negative effect on real investment. Both interest and dividends payments are negative determinants of real investment on EU countries. On the other hand, financial receipts remain a positive determinant to real investment, which indicates that the NFCs of these countries use these financial incomes to finance real investments. Once again, the variable of debt influences negatively real investment. This is consistent with the idea that NFCs are strongly indebted, whereby new debts are used to repay existing debts rather than to realise new real investments. In general, results confirm the ones obtained in the second Essay for the Portuguese economy. This show us that determinants of real investment are similar in Portugal and in the EU.

This Essay is also able to identify that the harmful effects of financialisation are worse in the more financialised countries. Thus and despite not focusing exclusively in the Portuguese economy, this is an important conclusion for Portugal. In relation to the

other countries, the Portuguese economy is less financialised. This suggests that any deepening of the financialisation process in Portugal could imply a higher slowdown of real investment with negative repercussion in economic growth and employment.

The fourth Essay performed a time series econometric analysis in order to assess the relationship between the financialisation process and the inequality on the Portuguese functional income distribution. The literature claims that the financialisation process decreases the labour income share, due to the change in sectorial composition of the economy (visible in the growing importance of the financial sector and in the downsizing of government activity), the "shareholder value orientation" management approach and the weakening of trade unions.

In this regard, we estimated a labour income share equation by incorporating the conventional variables (technological progress, globalisation, education and business cycle) and four variables linked to the financialisation process (financial activity, government activity, shareholder orientation and trade union density). We use macroeconomic data from 1978 to 2012.

The Essay estimated an ARDL, because we a have a mix of variables that are integrated of order zero and integrated of order one. In the long-term, we are able to identify that government activity and trade unions affect positively the labour income share, in line with the predictions of the literature on financialisation. In the short-term, trade unions continue to exert a positive influence on the Portuguese labour income share. However and in contradiction with the literature of financialisation, financial activity and shareholder orientation are not statistically significant in the long-term and are positive determinants of the Portuguese labour income share in the short-term. This could be associated with the fact that wages in the Portuguese financial sector are higher in comparison with other sectors and with the fact that a higher level of financial payments could be a symptom of better financial situation of NFCs that is associated with an increase in wages.

This Essay are also able to identify that the evolution of the Portuguese labour income share is also explained by the conventional variables (globalisation, education and business cycle), mainly in the long-term.

Overall, this PhD thesis contributed to the literature by offering further evidence that the financialisation process also affects negatively and from different ways the smaller, more peripheral and less developed economies, such as Portugal.

2. Policy Implications

Our conclusions suggest that could be necessary a reversal in the importance and in the power of the financial sector in the coming years, in order to re-achieve a higher sustainability of the financial system and re-establish a more supportive relationship between the financial sector and the real economy by reinforcing the efficiency of the link between savings and investment.

The argument is that the expressive growth of the financial sector in the last decades has not been associated with a faster economic growth, but instead with slower growth, higher levels of unemployment, rising inequality and increased incidence of financial and economic crisis. This raises concerns regarding the need to engage in policies that could be more conductive to economic growth, employment, quality of jobs, equality, and human development, which requires a higher sustainability of the financial system. In general, there is the need to take on in a de-financialisation process in the near future.

In fact and as noted by Palley (2007), "*financial markets are at the heart of the financialization process, and that suggests there is an urgent to restore effective control over these markets*" (Palley, 2007, p. 22). In the same fashion, Vercelli (2013) claims that "*the word and the underlying concept [of financialisation] started to be adopted widely in the following years but almost exclusively by heterodox economists who differently from orthodox ones, see financialization as a serious problem to be understood and removed, or at least mitigated*" (Vercelli, 2013, p. 20). He still adds that "*[…] the process of financialisation is mainly a pathological process of evolution within capitalism that requires that capitalism be radically reformed or superseded*" (Vercelli, 2013, p. 41).

In order to fulfil this purpose, Palley (2007) enumerates a set of policy recommendations related with three different dimensions, namely the neoliberalism philosophy, the corporate governance model and the economic policy as a whole.

In relation to the neoliberalism framework, he suggests the need to replace the current globalisation of corporations by a globalisation that may favour an equitable development, to substitute the decrease of government activity by a better government activity and to replace labour market flexibility by better jobs and productive workplaces.

Regarding the corporate governance model, the author argues the need to reduce the excessive payments to managers and shareholders, fight the lack of corporate accountability and the existence of misaligned incentives within corporations that favour the interests of shareholders rather than the ones of stakeholders (like employees). Against this backdrop, Dünhaupt (2013b) suggests that is crucial to replace the short-term focus imposed on corporations by the "shareholder value orientation" by a system of corporate governance that involves all stakeholders. She adds that this should be put in place by the adoption of tax policies and/or the imposition of competition laws in order to reduce monopoly profits.

With regard to the economic policy, he proposes the need to tackle issues around lobbying and the influence of wealth on politics. He also suggests the need to adopt a monetary policy framework that can help to stabilise the international financial markets and do not harm the real economy. He notes that the majority of international central banks have the short-term interest rate as the only effective policy instrument, which proved to be insufficient to circumvent the trade-off between curtailing financial speculation (by raising interest rates) and sustaining the economic growth (by decreasing interest rates). Against this backdrop, he proposes that the central banks should adopt a regulatory framework based on Asset-Based Reserve Requirements (ABRR), which imposes that all financial institutions (and not just banks) are obliged to hold reserves for all types of assets and not only for their deposits liabilities[55].

Concurrently, Hein (2012) advocates a strategy imbedded in a Global Keynesian New Deal, in order to circumvent the deleterious effects of the financialisation process paved in the last decades that contributed to the severity of the recent financial and economic crisis of the Great Recession. In general terms, this strategy is constructed in three different pillars[56], namely the re-regulation of the financial sector in order to prevent future crises, the re-orientation of macroeconomic policies in order to stimulate and stabilise domestic demand and to improve employment levels, and the re-construction of an international macroeconomic policy coordination and a new world financial order. For each pillar, the author suggests a set of specific policy measures.

[55] Palley (2004) and Hein (2012) present the general terms of a system based on ABRR, as well as its microeconomic and macroeconomic advantages.

[56] Hein (2012) claims that these three pillars are related to what he considers the three main causes of the Great Recession, namely the inefficient regulation of the financial system, the increasing inequality in the income distribution and the growing imbalances at the global and at the EA level.

Regarding the re-regulation of the financial sector, he stresses the need to reduce the problems of uncertainty, asymmetric information, moral hazard and fraud; to focus on long-term growth rather than short-term profitability; and to contain systemic financial instability. Accordingly, he proposes the implementation of the following measures: the standardisation, supervision and regulation at a national and international level of all financial products and non-bank financial institutions (insurance corporations, hedge funds, private equity funds, among others); the abolishment of off-balance sheet operations; the creation of independent public rating agencies in order to replace the private ones; the diversification of the banking system through the creation of public and co-operative banks in order to increase the supply of credit to small and medium corporations; the reinforcement of the financial intermediation function of banks; the reduction of securitisation operations in order to prevent the strategies of "originate to distribute" with high systemic risks; the reduction or even abolishment of share buybacks strategies by corporations; the minimisation of short-termism behaviour of managers in order to boost the realisation of long-term projects; the improvement of equity requirements in order to reduce leverage and to make financial intermediaries more resilient; the separation of commercial banks (savings and loans) from investment banks and from the shadow banking system in order to prevent contagion in the case of crises two last type of organizations; the introduction of ABRR; and the creation of a general transaction tax for all financial transactions and a general capital gains tax in order to reduce speculation and volatility of short-term financial flows. According to him, these measures, if implemented, will contribute to stabilise and orientate the financial sector towards to finance real activity and therefore favouring to a higher dynamism of the aggregate demand[57].

With regard to the re-orientation of macroeconomic policies, he proposes three set of measures oriented to the role of international central banks, the design of fiscal policies and the framework around incomes and wage policies. Thus, he argues that central banks should target low real interest rates in order to avoid unfavourable cost

[57] Hein (2012) also reinforces that the implementation of these measures will contribute to mitigate inequalities on income distribution, through three different channels. First, these measures imply a decrease of the financial sector, which contribute to contain the fall in the labour income share. Second, these measures boost the reduction of top management salaries and profit claims of financial wealth holders, which also contribute to mitigate the decline of the labour income share. Third, these measures intensify the orientation of managers to long-term expansion, which will favour a rise of the bargaining power of workers and trade unions and therefore an increase of the labour income share.

and distribution effects on corporations and workers[58], should act as "lender of last resort" mainly in period of liquidity crisis and should be involved in the regulation and supervision of the financial markets through the definition of credit standards for refinancing operations with commercial banks, the implementation of compulsory reserve requirements for different financial assets and the establishment of credit controls. He also claims that fiscal policies should be designed in order to guarantee a real stabilisation of the business cycle, full employment and a more equal distribution of disposable income, namely through the rise of public investment in infrastructures or in education and the implementation of progressive income taxes; relevant wealth, property and inheritance taxes; and social transfers in favour of low income and low wealth households. Finally, he stresses the importance of a higher wage bargaining co-ordination and organised labour markets through the reinforcement of trade unions and/or other employer associations and the need to establish a legal minimum legislation that contain wage dispersion in order to contribute to a higher equality in income distribution.

In relation to the re-construction of an international macroeconomic policy coordination and a new world financial order, he suggests increases in international policy coordination, namely through the establishment of targets for current account balances, the return to a cooperative world financial order, the adoption of a system with fixed but adjustable exchange rates and the implementation of international regulation of the international capital flows.

Vercelli (2013) claims that the best strategy is the implementation of a policy strategy that could filter the positive effects from the negative effects of the growth of the financial sector. He sustains that this may be done through the limitation of banks' freedom of acting and the excessive speculation, as for instance by imposing a Tobin tax on financial transactions. Sawyer (2015) also suggests the creation of financial transaction taxes or financial activity taxes, since the substantial growth of trading in the form of financial assets did not generate economic growth and employment. Accordingly, the aim of these taxes is the reduction of the volume of financial transactions and the release of resources (which are engaged in those transactions) to the most productive directions.

[58] Hein (2012) suggests a target of a slightly positive real interest rate, below the long-term rate of productivity growth.

Sawyer (2015) centres its attentions and recommendations in the need to develop, support and promote other financial institutions focused on the links between savings and investment. He emphasises that there are a wide range of financial institutions with different forms of ownership (private, public and mutual and co-operative), different objectives and market segments, but only some of them have been compatible with social and environmental objectives. So, he proposes the emergence of alternative forms of financial institutions, namely microfinance institutions, State development and investment banks, ethical banking and the mutual and local financial institutions. These new financial institutions should be able to finance more socially-oriented projects rather than to focus exclusively on profits and they should be organised at local and regional levels. Concurrently, he defends the adoption of credit allocation policies in order to channel more funds to productive economic activities. These credit allocation policies should include the introduction of interest rates subsidies, loans guarantee programs and tax incentives.

Against this backdrop, van der Zwan (2014) notes that in the recent years emerged new initiatives that aim to reduce the power of finance, namely inside the realm of finance (through the appearance of peer-to-peer lending platforms and the reinforcement of cooperative banks) and outside (via the resurgence of new forms of community ownership and systems of sharing). Nonetheless, she emphasises that these measures have been insufficient, probably because there has not been a change in economic thinking, like what happened with the implementation of New Deal in the 1930s. This represents a strong constrain to policy makers (and academics) to present of new economic strategies that could induce a higher long-term sustainability, inclusiveness and equality.

Although less financialised when compared with other economies, the Portuguese economy exhibits a relatively wide range of indications that it is in a financialisation process, which already shows negative consequences. This illustrates that Portuguese policy makers should also take into account the aforementioned policy recommendations in order to contain a deepening of the financialisation process and mitigate its harmful effects in the coming years.

However, we should recognise that Portuguese policy makers have a little margin of manoeuvre to engage in the majority of these measures in the short-term, which is due to three fundamental reasons. Firstly, some of these measures imply an international coordination and Portuguese policy makers do not have the sufficient

power to persuade its international partners for its adoption. Second, the Portuguese economy is a small economy of the EA, not having the better conditions in terms of political importance to negotiate a substantial change of the design of the respective monetary policy and deep changes in the rules of banking regulation with the ECB. Thirdly, the Portuguese policy makers are constantly pressed by the rules of the EA to sustain a fiscal consolidation, which prevent them to adopt some of these recommendations that could delineate an increase of the respective public deficit and public debt. Anyhow, these constrains should not serve as an excuse to do nothing, since some measures are compatible with these forces.

We would like to refer to the implementation of a fiscal policy that may boost the real and productive investments and mitigate the increasing levels of inequality. Here, it is not sufficient to implement a simple decrease in the respective profit tax rates (which is the more traditional form), but a decrease only for corporations who reinvest their profits and create permanent jobs. This should guarantee higher levels of retention ratios by corporations, mitigating the detrimental effects on real investment and on the decrease of the labour income share related with the "shareholder value orientation". A deepening of the progressive income taxes would be welcomed in order to attenuate inequalities.

These two measures will probably imply a reduction of public receipts, which could be compensated (or even supplanted) by the imposition of a tax on financial transactions and/or an increase of taxes related to inheritances and large fortunes. This would allow gaining a fiscal leeway to support a set of social transfers. An increase of the minimum wage, the re-establishment of collective wage bargaining (with the increase of trade union density) and the funding of public services (like education or health) are crucial policies to ensure fewer inequalities and minimise the risks of poverty of the Portuguese general population. The last policy recommendation should also imply a re-thinking in the recent privatisations, namely in the areas linked to transports, health, social security, water provision and others, in order to mitigate an increase in social exclusion and inequality of the general population in their access to these services.

Finally, we would like to propose a reinforcement of the intermediation role of *Caixa Geral Depósitos* – the only public bank in the Portuguese banking system – namely through financing more socially desirable projects, more productive investments and more small and medium corporations. In the same fashion, we propose the

maintenance or even an increase of the fiscal advantages to *Caixa Económica Montepio Geral* and to *Crédito Agrícola* – the only mutual bank and co-operative bank, respectively, in the Portuguese banking system – insofar as it is argued that this type of banks are strongly attached to the local economies, denote a higher business conservative stance and follow the traditional approach to intermediation based on a strategy of "originate to hold" rather than a strategy of "originate to distribute" (Barradas *et al.*, 2011). Rather than to focus exclusively on profits (like the remaining private banks), these three banks contribute to the diversity and richness of the Portuguese banking system, which may improve the economic and social impact of the banking industry and reinforce a higher efficiency in the link between savings and investments.

We recognise that we are proposing a too simple strategy composed by a short-list of measures, but our aim is to show that there is a way to begin the reversal of the current financialisation process in the Portuguese economy and to present recommendations that may correspond to a first step in the way towards a de-financialisation process.

Note that these policy recommendations were not directly tested in this PhD thesis, but they result from our interpretation based on the literature on how to reduce financialisation dynamics, given its negative effects identified in our work.

3. Limitations of the Thesis

Regarding the first Essay, we try to find the origins and the main symptoms of the financialisation process in Portugal. This does not exclude the existence of other evidences related with that. Our main goal was to highlight only some of them, perhaps the most notorious. In addition, this Essay tries to establish a causal link between the financialisation process and the recent Portuguese sovereign debt crisis. This should be also interpreted with some care, since other factors have caused this crisis beyond the financialisation process. We just wanted to show that the financialisation process put in evidence some structural weaknesses of the Portuguese economy in the last years, which contributed to the emergence of the respective crisis.

The remaining Essays of this PhD thesis aimed to analyse the consequences of the financialisation process in the Portuguese economy following a macroeconomic

perspective. This approach had the advantage of understanding if the phenomenon of financialisation had harmful macroeconomic impacts on the Portuguese economy, but introduces some limitations on the respective analysis.

In relation to the second Essay, we find a disruptive relationship between the financialisation process and real investment of Portuguese NFCs as a whole. Nonetheless, we are unable to conclude if this disruptive relationship occur due to the impact of some large corporations or it is a transversal phenomenon across all corporations from different sectors and industries and with different dimensions and ownership.

This limitation is also valid to the third Essay. This Essay is able to identify a harmful macroeconomic effect of the financialisation process on the real investment of EU countries. Here, we are unable to identify whether this harmful effect is due to the impact of some corporations/countries or it is a more generalised phenomenon across all corporations/countries.

Finally and with regard to the fourth Essay, we find that the financialisation process has been determinant to the fall of the Portuguese labour income share. Once again, we are not able to stress if these negative effects of the financialisation process on labour income share occur only in some corporations, sectors or industries or if they are transversal to the whole economy.

4. Suggestions for further Research

In order to add more evidences of the negative effects of the financialisation process in Portugal and to avoid the main limitations of this PhD thesis, there are some interesting future extensions of this work. We propose three different lines of investigation that we hope to carry out in the future.

Firstly, it would be interesting analysing econometrically the relationship between the financialisation process and the aggregate consumption through the derivation and estimation of an aggregate consumption function. In the same fashion, we suggest the econometric analysis of the effects of the financialisation process in the inequality of personal income distribution. These two studies would conclude the analysis of the long-term effects of the financialisation from a post Keynesian

macroeconomic perspective, as proposed by Hein (2012), Hein and van Treeck (2010) and Hein and Dodig (2015).

Secondly, it would be relevant extending this work through the use of micro databases at an industry-level or corporation-level. This will allow us to better understand the effects of the financialisation process on NFCs (and on the respective wages paid to workers) from different countries, sectors, industries, NFCS' dimensions and ownerships.

Thirdly, it would be useful to extend the econometric analysis provided here, not to analyse the consequences of the financialisation process in the Portuguese economy but to investigate its determinants and causes. Here, we propose to use the variables of financialisation as dependent variables and find its determinants.

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VIII. Appendix

1. Tables

Table A1 – The descriptive statistics of the data

	I	***P***	***D***	***CC***	***SR***	***OG***	***FR***	***FP***
Observations	37	37	37	37	37	37	37	37
Mean	0.257	0.351	-0.152	0.019	0.140	0.025	0.062	0.242
Median	0.263	0.371	-0.114	0.016	0.126	0.022	0.056	0.231
Maximum	0.311	0.405	-0.010	0.109	0.220	0.079	0.121	0.465
Minimum	0.189	0.187	-0.494	-0.083	0.070	-0.032	0.021	0.154
Standard Deviation	0.036	0.054	0.118	0.038	0.044	0.029	0.024	0.079
Skewness	-0.315	-1.390	-1.123	-0.281	0.273	0.008	0.689	1.246
Kurtosis	1.816	4.033	3.608	3.898	1.732	2.366	3.000	4.036

Table A2 – The diagnostic for multicollinearity

Dependent Variable	$R^2_{adjusted}$	**Tolerance Value**	**VIF**
I	0.703	0.297	3.367
P	0.851	0.149	6.711
D	0.914	0.086	11.628
CC	0.606	0.394	2.538
SR	0.866	0.134	7.463
OG	0.586	0.414	2.415
FR	0.777	0.222	4.484
FP	0.847	0.153	6.536

Table A3 – Inverse roots of AR characteristic polynomial (for an unrestricted VAR with three lags)

Root	**Modulus**
0.795 + 0.654i	1.029
0.795 – 0.654i	1.029
0.920 + 0.390i	0.999
0.920 – 0.390i	0.999
0.443 + 0.870i	0.977
0.443 – 0.870i	0.977
0.925	0.925
-0.185 – 0.904i	0.922
-0.185 + 0.904i	0.922
0.485 – 0.766i	0.907
0.485 + 0.766i	0.907
-0.674 – 0.589i	0.895
-0.674 + 0.589i	0.895
0.818 + 0.286i	0.867
0.818 – 0.286i	0.867
-0.854	0.854
0.096 + 0.833i	0.838
0.096 – 0.833i	0.838
-0.645 + 0.417i	0.768
-0.645 – 0.417i	0.768
-0.635	0.635
-0.175 + 0.607i	0.632
-0.175 – 0.607i	0.632
0.111	0.111

Note: i is the imaginary number

Table A4 – Inverse roots of AR characteristic polynomial (for the VECM estimated)

Root	Modulus
1.000	1.000
1.000	1.000
1.000	1.000
1.000	1.000
1.000	1.000
1.000	1.000
1.000	1.000
0.462 – 0.391i	0.606
0.462 + 0.391i	0.606
-0.565	0.565
-0.061 – 0.430i	0.434
-0.061 + 0.430i	0.434
-0.406	0.406
0.328	0.328
0.030 – 0.158i	0.161
0.030 + 0.158i	0.161

Note: i is the imaginary number

Table A5 – The long-term estimations of investment for the fourth model (the level data and the cointegration equations have linear trends)

Variable	P_t	D_t	CC_t	SR_t	OG_t	FR_t	FP_t	β_0	@Trend
I_t	1.076***	-0.432***	-1.059***	1.027***	0.470***	1.058***	-0.414***	0.333	0.002***
	(0.078)	(0.036)	(0.062)	(0.101)	(0.079)	(0.113)	(0.040)		(0.000)
	[-13.726]	[12.153]	[16.983]	[-10.192]	[-5.962]	[-9.349]	[10.275]		[-6.529]
Observations: 35 (1979-2013)									

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

Table A6 – The short-term dynamic of investment for the fourth model (the level data and the cointegration equations have linear trends)

Variable	ΔI_{t-1}	ΔP_{t-1}	ΔD_{t-1}	ΔCC_{t-1}	ΔSR_{t-1}	ΔOG_{t-1}	ΔFR_{t-1}	ΔFP_{t-1}	β_0
ΔI_t	0.225*	0.270*	-0.086	0.093	0.142*	0.003	0.190	-0.094	-0.004*
	(0.144)	(0.169)	(0.123)	(0.169)	(0.238)	(0.167)	(0.429)	(0.203)	(0.003)
	[1.568]	[1.595]	[-0.696]	[0.549]	[0.598]	[0.017]	[0.444]	[-0.465]	[-1.314]

Observations: 35 (1979-2013); $\mathbf{R^2}$ = 0.647; $R^2_{adjusted}$ = 0.520; **F-statistic** = 5.087; **Log Likelihood** = 100.349

Note: Δ is the operator of the first differences, standard errors in ( ), t-statistics in [] and * indicates statistical significance at 10% level

Table A7 – Bounds test for cointegration analysis of investment equation with short-term real interest rates

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
7.929	1%	2.848	4.126
	5%	2.272	3.447
	10%	1.956	3.085

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 eight

Table A8 – The long-term estimations of investment with short-term real interest rates

Variable	Coefficient	*Standard Error*	T-statistic
P_t	0.826***	0.197	4.196
D_t	-0.461***	0.079	-5.831
CC_t	-0.426***	0.127	-3.356
SR_t	0.256	0.182	1.403
OG_t	0.315**	0.132	2.392
FR_t	0.486*	0.258	1.879
FP_t	-0.269***	0.091	-2.955
β_0	-0.105	0.098	-1.071
Observations: 35 (1979-2013)			

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

Table A9 – The short-term estimations of investment with short-term real interest rates

Variable	Coefficient	*Standard Error*	T-statistic
ΔI_{t-1}	0.328**	0.124	2.639
ΔP_t	0.282	0.273	1.034
ΔD_t	-0.115*	0.062	-1.842
ΔCC_t	-0.248*	0.126	-1.971
ΔSR_t	0.043	0.218	0.197
ΔOG_t	0.308**	0.123	2.499
ΔFR_t	0.113	0.244	0.461
ΔFP_t	0.026	0.105	0.251
EC_{t-1}	-0.976***	0.113	-8.611

Observations: 35 (1979-2013); $\mathbf{R^2}$ = 0.895; $R^2_{adjusted}$ = 0.812; **F-statistic** = 18.009***; **Log Likelihood** = 121.59

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 A10 – The descriptive statistics of the data

	I	*P*	*D*	*CC*	*SR*	*OG*	*FR*	*FP*
Observations	450	450	450	450	450	450	450	450
Mean	0.246	0.427	-0.019	0.026	0.096	0.025	0.090	0.212
Median	0.238	0.414	-0.013	0.025	0.105	0.028	0.066	0.205
Maximum	0.512	0.603	0.250	0.245	0.211	0.140	0.637	0.708
Minimum	0.041	0.280	-0.447	-0.232	-0.202	-0.150	0.001	0.043
Standard Deviation	0.070	0.074	0.092	0.039	0.066	0.036	0.083	0.091
Skewness	0.769	0.278	-0.502	0.325	-1.282	-0.907	2.509	1.264
Kurtosis	3.516	2.274	4.467	13.413	5.090	6.662	12.715	6.708

Table A11 – The Breusch and Pagan Lagrangian Multiplier (LM) test and the Hausman test for the investment function with financial receipts and financial payments divided between interest and dividends

Test	Chi-square	*P-value*
LM test	931.08	0.000
Hausman test	6.42	0.697

Table A12 – Diagnostic tests for the investment function with financial receipts and financial payments divided between interest and dividends

Test		Statistic	*P-value*
Period Heteroscedasticity	W_0	2.743	0.000
	W_{50}	2.170	0.005
	W_{10}	2.549	0.001
Cross-sectional Heteroscedasticity	W_0	7.748	0.000
	W_{50}	5.412	0.000
	W_{10}	7.102	0.000
Group-wise Heteroscedasticity		n. a.	n. a.
Serial Correlation		46.357	0.000
Cross-sectional Dependence	**Friedman**	24.741	0.534
	Frees	1.552	n. a.
	Pesaran	7.090	0.000

Note: The critical values from Frees' Q distribution (T-asymptotically distributed) are 0.489, 0.686 and 1.105 to the significance levels of 10%, 5% and 1%, respectively

Table A13 – The Wald test on the equality of interest payments and dividends payments

Null hypothesis	T-statistic	*P-value*
$IP_{t-1} = DP_{t-1}$	0.09	0.773

Table A14 – The average of financial receipts and financial payments per country

Country	FR	FP
Austria	0.074	0.199
Belgium	0.170	0.261
Bulgaria	0.021	0.097
Cyprus	0.146	0.274
Czech Republic	0.035	0.172
Denmark	0.145	0.181
Estonia	0.033	0.108
Finland	0.105	0.215
France	0.180	0.272
Germany	0.061	0.257
Greece	0.034	0.213
Hungary	0.103	0.203
Ireland	0.035	0.257
Italy	0.050	0.278
Latvia	0.047	0.225
Lithuania	0.013	0.303
Luxembourg	0.458	0.558
Netherlands	0.107	0.164
Norway	0.108	0.273
Poland	0.029	0.137
Portugal	0.075	0.211
Romania	0.041	0.124
Slovakia	0.039	0.142
Slovenia	0.036	0.083
Spain	0.054	0.154
Sweden	0.258	0.337
UK	0.080	0.203
All Countries	**0.090**	**0.212**

Table A15 – The distribution between the more and the less financialised countries

FR		**FP**	
More	**Less**	**More**	**Less**
Belgium	Austria	Belgium	Austria
Cyprus	Bulgaria	Cyprus	Bulgaria
Denmark	Czech Republic	Finland	Czech Republic
Finland	Estonia	France	Denmark
France	Germany	Germany	Estonia
Hungary	Greece	Greece	Hungary
Luxembourg	Ireland	Ireland	Netherlands
Netherlands	Italy	Italy	Poland
Norway	Latvia	Latvia	Portugal
Sweden	Lithuania	Lithuania	Romania
	Poland	Luxembourg	Slovakia
	Portugal	Norway	Slovenia
	Romania	Sweden	Spain
	Slovakia		UK
	Slovenia		
	Spain		
	UK		

Table A16 – The Breusch and Pagan Lagrangian Multiplier (LM) test and the Hausman test for the investment function with two dummies for the more financialised countries

Test	**Chi-square**	***P-value***
LM test	936.65	0.000
Hausman test	40.44	0.000

Table A17 – Diagnostic tests for the investment function with two dummies for the more financialised countries

Test		**Statistic**	***P-value***
Period Heteroscedasticity	$\mathbf{W_0}$	1.619	0.056
	$\mathbf{W_{50}}$	1.550	0.074
	$\mathbf{W_{10}}$	1.606	0.059
Cross-sectional Heteroscedasticity	$\mathbf{W_0}$	9.559	0.000
	$\mathbf{W_{50}}$	5.582	0.000
	$\mathbf{W_{10}}$	8.582	0.000
Group-wise Heteroscedasticity		446.38	0.000
Serial Correlation		44.617	0.000
Cross-sectional Dependence	**Friedman**	33.593	0.146
	Frees	1.609	n. a.
	Pesaran	8.584	0.000

Note: The critical values from Frees' Q distribution (T-asymptotically distributed) are 0.489, 0.686 and 1.105 to the significance levels of 10%, 5% and 1%, respectively

Table A18 – 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 A19 – 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 A20 – Inverse roots of AR characteristic polynomial (for an unrestricted VAR with four lags)

Root	**Modulus**
1.022	1.022
-0.923	0.923
0.473 – 0.785i	0.917
0.473 + 0.785i	0.917
-0.565 + 0.717i	0.913
-0.565 – 0.717i	0.913
0.687 – 0.592i	0.907
0.687 + 0.592i	0.907
-0.701 – 0.524i	0.875
-0.701 + 0.524i	0.875
-0.091 + 0.827i	0.833
-0.091 – 0.827i	0.833
0.821	0.821
0.742 + 0.248i	0.783
0.742 – 0.248i	0.783
0.360 + 0.660i	0.752
0.360 – 0.660i	0.752
0.069 – 0.680i	0.684
0.069 + 0.680i	0.684
-0.594	0.594

Note: i is the imaginary number

Table A21 – The Wald test on the impact of the government activity in the short-term

Null hypothesis	**Chi-square**	***P-value***
$\Delta GA_t + \Delta GA_{t-1} = 0$	0.172	0.678

Table A22 – Bounds test for cointegration analysis (long version with financial activity including also real estate activities)

F-statistic	**Critical Value**	**Lower Bound Value**	**Upper Bound Value**
4.192	1%	2.716	3.989
	5%	2.163	3.349
	10%	1.899	2.964

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

Table A23 – The long-term estimations of labour income share (long version with financial activity including also real estate activities)

Variable	Coefficient	*Standard Error*	T-statistic
TP_t	-0.824***	0.132	-6.247
GL_t	-0.231***	0.036	-6.355
ED_t	0.134***	0.022	5.966
BC_t	0.606***	0.097	6.274
FA_t	0.647***	0.098	6.597
GA_t	0.435**	0.145	3.007
SO_t	0.004	0.028	0.139
TU_t	0.645***	0.052	12.411
β_0	0.236***	0.060	3.930
Observations: 33 (1980-2012)			

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

Table A24 – The short-term estimations of labour income share (long version with financial activity including also real estate activities)

Variable	Coefficient	*Standard Error*	T-statistic
ΔLS_{t-1}	0.603***	0.190	3.173
ΔTP_t	-0.572***	0.180	-3.172
ΔTP_{t-1}	0.502***	0.138	3.625
ΔGL_t	-0.260***	0.070	-3.720
ΔED_t	0.001	0.069	0.014
ΔBC_t	1.222***	0.237	5.158
ΔFA_t	0.492	0.401	1.228
ΔFA_{t-1}	0.546	0.367	1.487
ΔGA_t	0.406*	0.219	1.853
ΔGA_{t-1}	-0.665**	0.246	-2.705
ΔSO_t	0.044	0.069	0.638
ΔSO_{t-1}	0.068	0.050	1.372
ΔTU_t	0.910***	0.203	4.487
EC_{t-1}	-2.016***	0.246	-8.203
Observations: 33 (1980-2012); $\mathbf{R^2}$ = 0.963; $R^2_{adjusted}$ = 0.894; **F-statistic** = 20.734***; **Log Likelihood** = 142.44			

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 A25 – Bounds test for cointegration analysis (long version with net financial payments)

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
3.756	1%	2.716	3.989
	5%	2.163	3.349
	10%	1.899	2.964

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

Table A26 – The long-term estimations of labour income share (long version with net financial payments)

Variable	Coefficient	*Standard Error*	T-statistic
TP_t	-0.763*	0.381	-2.003
GL_t	-0.319***	0.056	-5.737
ED_t	0.207***	0.055	3.777
BC_t	0.987***	0.174	5.677
FA_t	0.667	0.717	0.930
GA_t	0.993**	0.321	3.095
SO_t	-0.110	0.160	-0.689
TU_t	0.866***	0.062	14.078
β_0	0.006	0.112	0.058
Observations: 33 (1980-2012)			

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

Table A27 – The short-term estimations of labour income share (long version with net financial payments)

Variable	Coefficient	*Standard Error*	T-statistic
ΔLS_{t-1}	0.476*	0.249	1.910
ΔTP_t	-0.276	0.392	-0.703
ΔTP_{t-1}	0.183	0.196	0.937
ΔGL_t	-0.162	0.141	-1.154
ΔED_t	0.064	0.141	0.453
ΔED_{t-1}	0.205	0.180	1.138
ΔBC_t	1.386**	0.574	2.415
ΔFA_t	0.703	1.134	0.620
ΔFA_{t-1}	1.248	0.818	1.526
ΔGA_t	1.414***	0.444	3.185
ΔGA_{t-1}	-1.543***	0.489	-3.154
ΔSO_t	0.182	0.306	0.592
ΔSO_{t-1}	0.745*	0.390	1.911
ΔTU_t	0.548	0.398	1.378
ΔTU_{t-1}	-0.460	0.400	-1.149
EC_{t-1}	-1.815***	0.398	-4.564
Observations: 33 (1980-2012); $\mathbf{R^2}$ = 0.934; $R^2_{adjusted}$ = 0.736; **F-statistic** = 7.066***; **Log Likelihood** = 132.646			

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 A28 – Bounds test for cointegration analysis (long version with a variable of NFCs' indebtedness)

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
3.963	1%	2.716	3.989
	5%	2.163	3.349
	10%	1.899	2.964

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

Table A29 – The long-term estimations of labour income share (long version with a variable of NFCs' indebtedness)

Variable	Coefficient	*Standard Error*	T-statistic
TP_t	0.052	0.215	0.244
GL_t	-0.262***	0.047	-5.513
ED_t	0.111**	0.042	2.666
BC_t	1.489***	0.170	8.753
FA_t	-0.036	0.420	-0.085
GA_t	1.097***	0.184	5.968
D_t	0.093**	0.033	2.854
TU_t	0.847***	0.059	14.356
β_0	-0.030	0.078	-0.382
Observations: 32 (1981-2012)			

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

Table A30 – The short-term estimations of labour income share (long version with a variable of NFCs' indebtedness)

Variable	Coefficient	*Standard Error*	T-statistic
ΔLS_{t-1}	0.278*	0.137	2.024
ΔTP_t	0.064	0.261	0.246
ΔGL_t	-0.320***	0.069	-4.611
ΔED_t	-0.118*	0.064	-1.845
ΔED_{t-1}	0.186**	0.069	2.717
ΔBC_t	1.666***	0.268	6.205
ΔBC_{t-1}	-0.938***	0.218	-4.304
ΔFA_t	-0.044	0.511	-0.086
ΔGA_t	0.977***	0.176	5.545
ΔGA_{t-1}	-1.422***	0.220	-6.452
ΔD_t	0.337***	0.079	4.248
ΔD_{t-1}	-0.384***	0.084	-4.552
ΔTU_t	0.911***	0.205	4.434
ΔTU_{t-1}	0.398**	0.150	2.650
EC_{t-1}	-1.224***	0.165	-7.427
Observations: 32 (1981-2012); $\mathbf{R^2}$ = 0.958; $R^2_{adjusted}$ = 0.883; **F-statistic** = 16.901***; **Log Likelihood** = 136.54			

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 A31 – Bounds test for cointegration analysis (long version from 1980 onwards)

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
4.009	1%	2.716	3.989
	5%	2.163	3.349
	10%	1.899	2.964

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

Table A32 – The long-term estimations of labour income share (long version from 1980 onwards)

Variable	Coefficient	*Standard Error*	T-statistic
TP_t	0.186	0.229	0.815
GL_t	-0.290***	0.054	-5.365
ED_t	0.219***	0.035	6.222
BC_t	0.596***	0.164	3.632
FA_t	0.329	0.618	0.533
GA_t	0.525**	0.225	2.332
SO_t	0.020	0.055	0.358
TU_t	0.660***	0.105	6.309
β_0	0.241*	0.109	2.206
Observations: 31 (1982-2012)			

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

Table A33 – The short-term estimations of labour income share (long version from 1980 onwards)

Variable	Coefficient	*Standard Error*	T-statistic
ΔTP_t	0.311	0.391	0.796
ΔGL_t	-0.377***	0.105	-3.589
ΔGL_{t-1}	-0.112	0.101	-1.101
ΔED_t	0.182	0.108	1.689
ΔBC_t	0.238	0.508	0.468
ΔBC_{t-1}	-0.268	0.194	-1.383
ΔFA_t	2.025***	0.668	3.031
ΔFA_{t-1}	1.567	0.956	1.639
ΔGA_t	0.556	0.326	1.707
ΔGA_{t-1}	-0.487	0.322	-1.512
ΔSO_t	0.244*	0.129	1.894
ΔSO_{t-1}	0.120	0.083	1.452
ΔTU_t	0.460	0.302	1.525
EC_{t-1}	-1.669***	0.302	-5.523
Observations: 31 (1982-2012); $\mathbf{R^2}$ = 0.932; $R^2_{adjusted}$ = 0.775; **F-statistic** = 8.871***; **Log Likelihood** = 124.783			

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

Table A34 – Bounds test for cointegration analysis (long version with a dummy variable for the years 2009 to 2012 and without the technological progress)

F-statistic	Critical Value	Lower Bound Value	Upper Bound Value
3.705	1%	2.716	3.989
	5%	2.163	3.349
	10%	1.899	2.964

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

Table A35 – The long-term estimations of labour income share (long version with a dummy variable for the years 2009 to 2012 and without the technological progress)

Variable	Coefficient	*Standard Error*	T-statistic
GL_t	-0.245***	0.045	-5.497
ED_t	0.246***	0.026	9.392
BC_t	0.721***	0.126	5.737
FA_t	1.101***	0.264	4.164
GA_t	0.727***	0.164	4.419
SO_t	-0.058	0.035	-1.666
TU_t	0.835***	0.055	15.051
β_0	0.037	0.083	0.448
Dummy	-0.014**	0.007	-2.193
Observations: 33 (1980-2012)			

Note: Dummy takes the value 1 for the years 2009 to 2012 and the value 0 for the remaining years, *** indicates statistical significance at 1% level and ** indicates statistical significance at 5% level

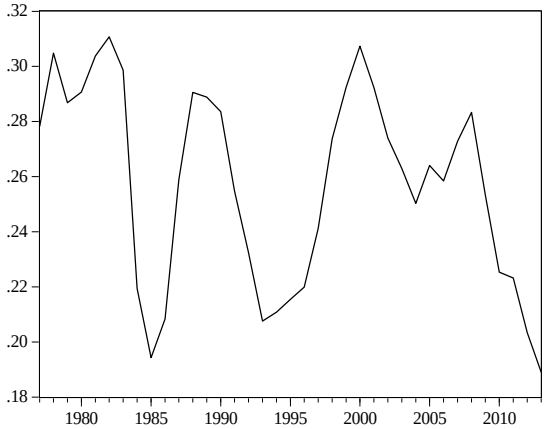
Table A36 – The short-term estimations of labour income share (long version with a dummy variable for the years 2009 to 2012 and without the technological progress)

Variable	Coefficient	*Standard Error*	T-statistic
ΔGL_t	-0.350***	0.804	-4.347
ΔED_t	0.144*	0.075	1.919
ΔBC_t	0.631**	0.224	2.818
ΔBC_{t-1}	-0.505***	0.146	-3.463
ΔFA_t	1.571***	0.432	3.638
ΔGA_t	0.541***	0.181	2.985
ΔGA_{t-1}	-0.464**	0.194	-2.389
ΔSO_t	0.114*	0.057	2.007
ΔSO_{t-1}	0.106*	0.052	2.033
ΔTU_t	0.493**	0.225	2.188
ΔTU_{t-1}	-0.181	0.194	0.937
$\Delta Dummy_{t-1}$	-0.020**	0.009	-2.164
EC_{t-1}	-1.427***	0.167	-8.552
Observations: 33 (1980-2012); $\mathbf{R^2}$ = 0.936; $R^2_{adjusted}$ = 0.854; **F-statistic** = 15.809***; **Log Likelihood** = 133.23			

Note: Dummy takes the value 1 for the years 2009 to 2012 and the value 0 for the remaining years, 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

2. Figures

Figure A1 – Investment of NFCs (% of gross value added of NFCs)



Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

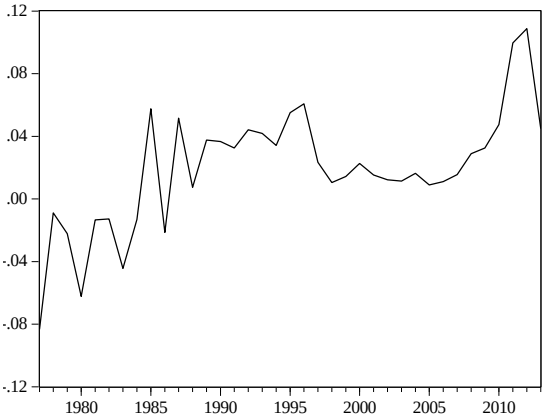
Figure A2 – Profitability of NFCs (% of gross value added of NFCs)

Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Figure A3 – Debt of NFCs (% of gross value added of NFCs)

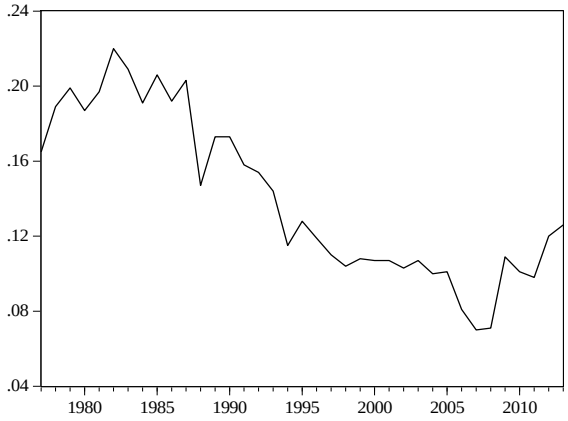
Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Figure A4 – Cost of capital (%)



Source: AMECO

Figure A5 – Savings rate (% of disposable income)

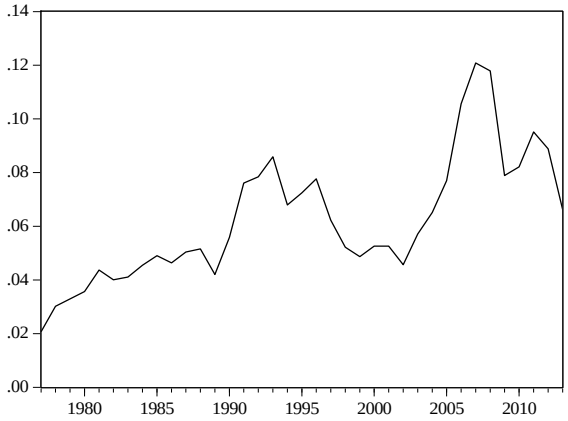


Source: PORDATA

Figure A6 – Output growth (annual growth rate)

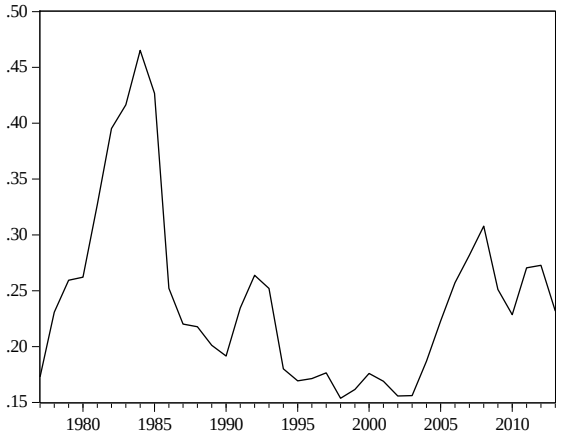
Source: PORDATA

Figure A7 – Financial receipts of NFCs (% of gross value added of NFCs)



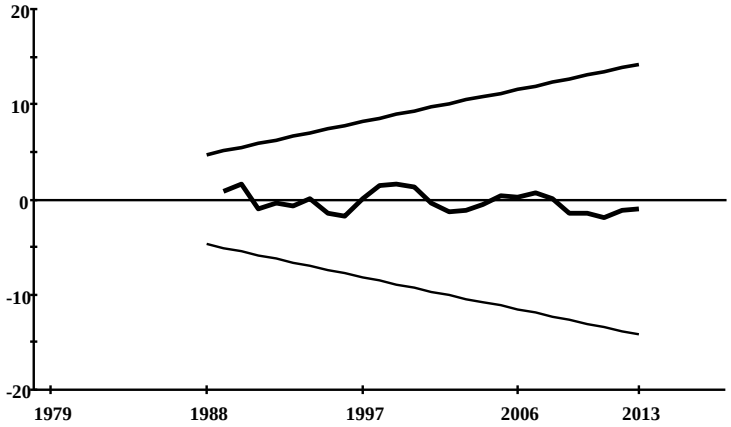
Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Figure A8 – Financial payments of NFCs (% of gross value added of NFCs)



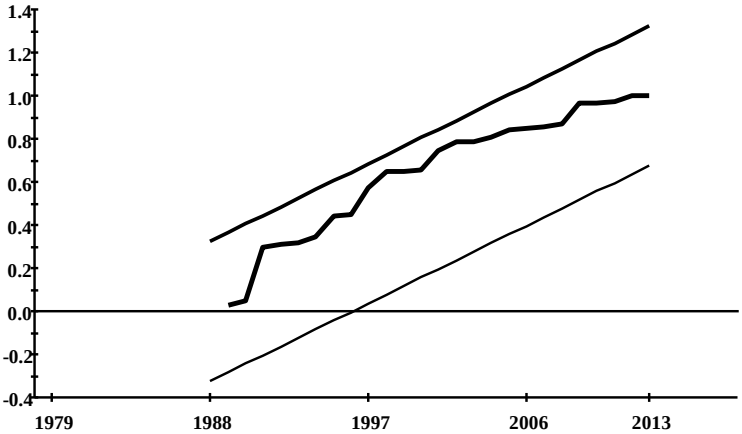
Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Figure A9 – CUSUM of recursive residuals (for the VECM estimated)



Note: The straight lines represent critical bounds at 5% significance level and they were obtained in Microfit software (5.0 version)

Figure A10 – CUSUMSQ of recursive residuals (for the VECM estimated)



Note: The straight lines represent critical bounds at 5% significance level and they were obtained in Microfit software (5.0 version)

Figure A11 – Generalised IRFs (accumulated responses of profitability to one s.d. innovations)

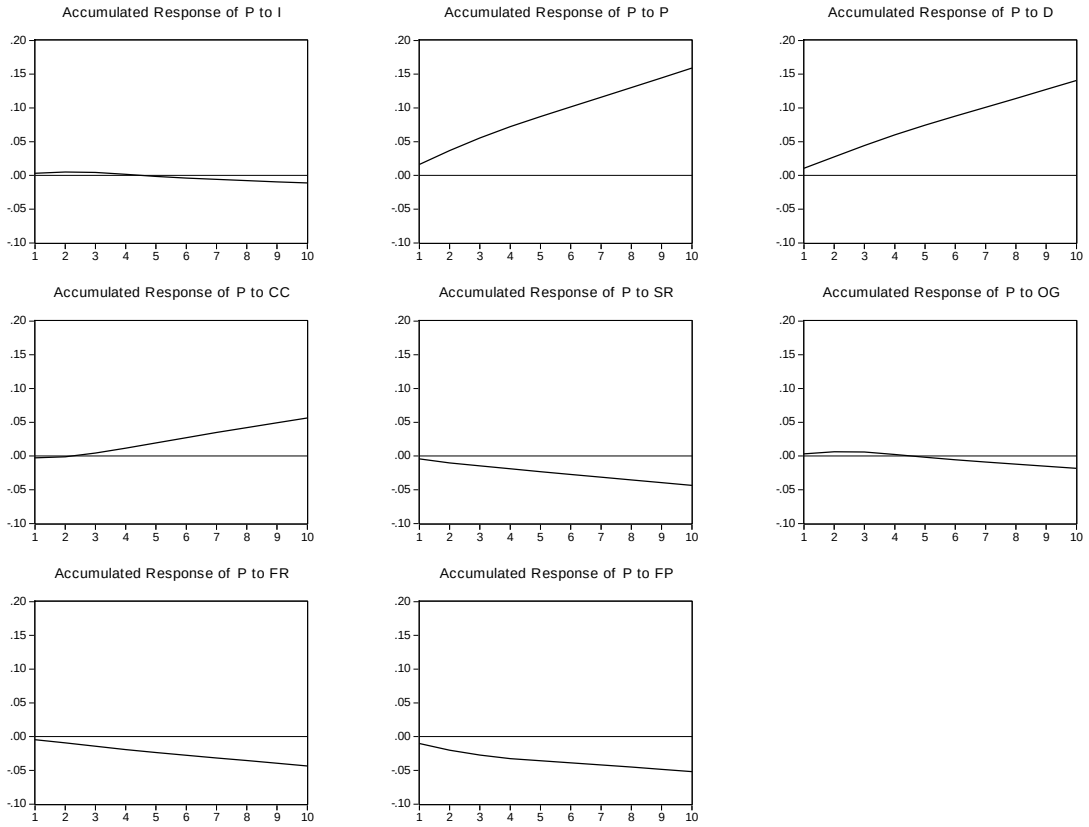


Figure A12 – Generalised IRFs (accumulated responses of output growth to one s.d. innovations)

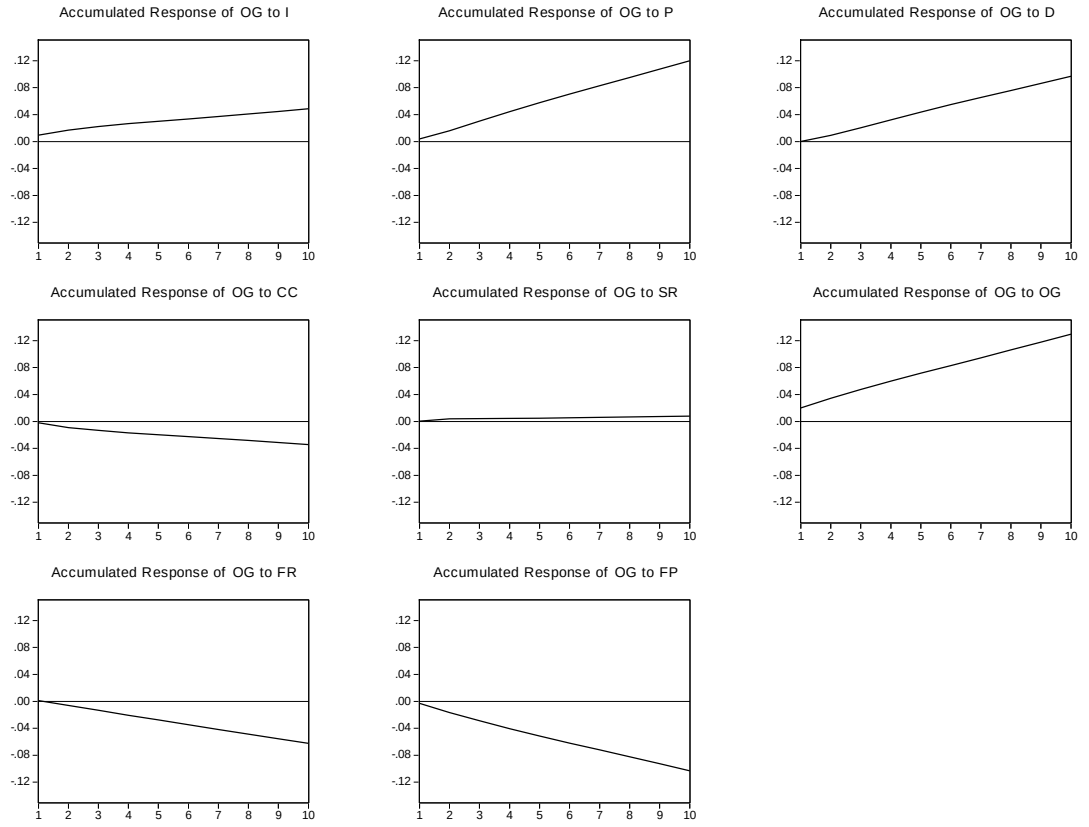


Figure A13 – Generalised IRFs for the fourth model (the level data and the cointegration equations have linear trends) (accumulated responses of investment to one s.d. innovations)

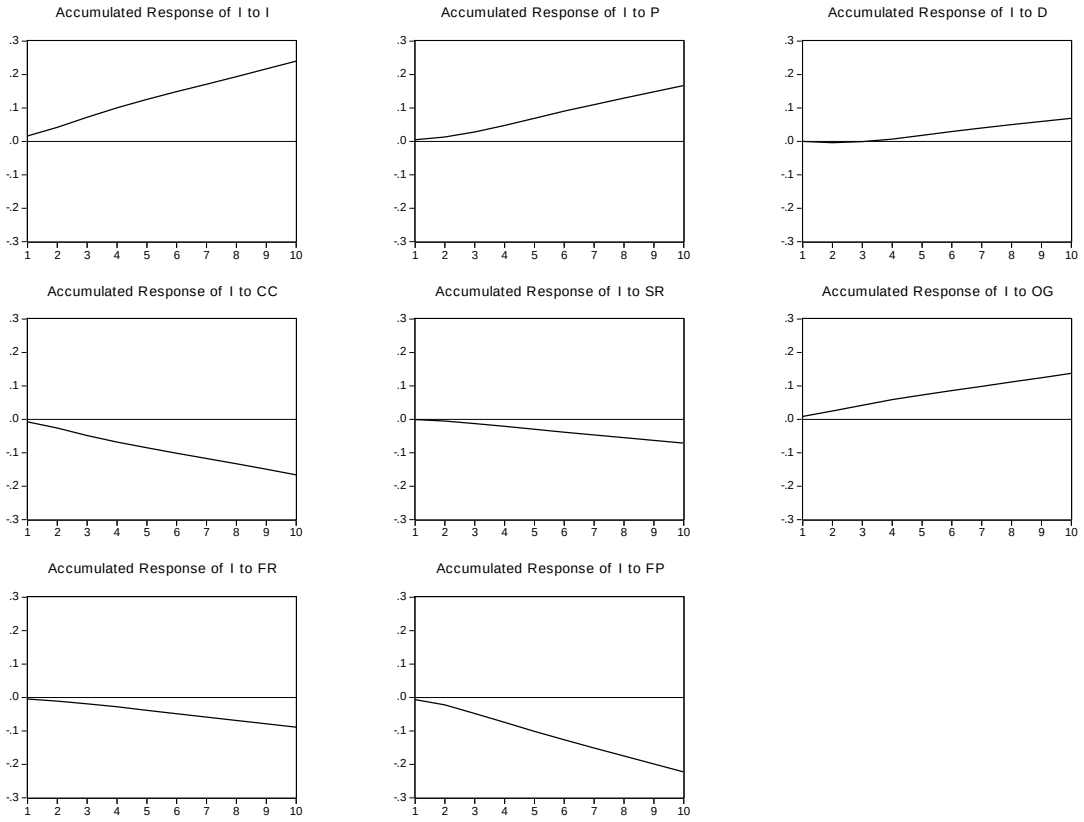
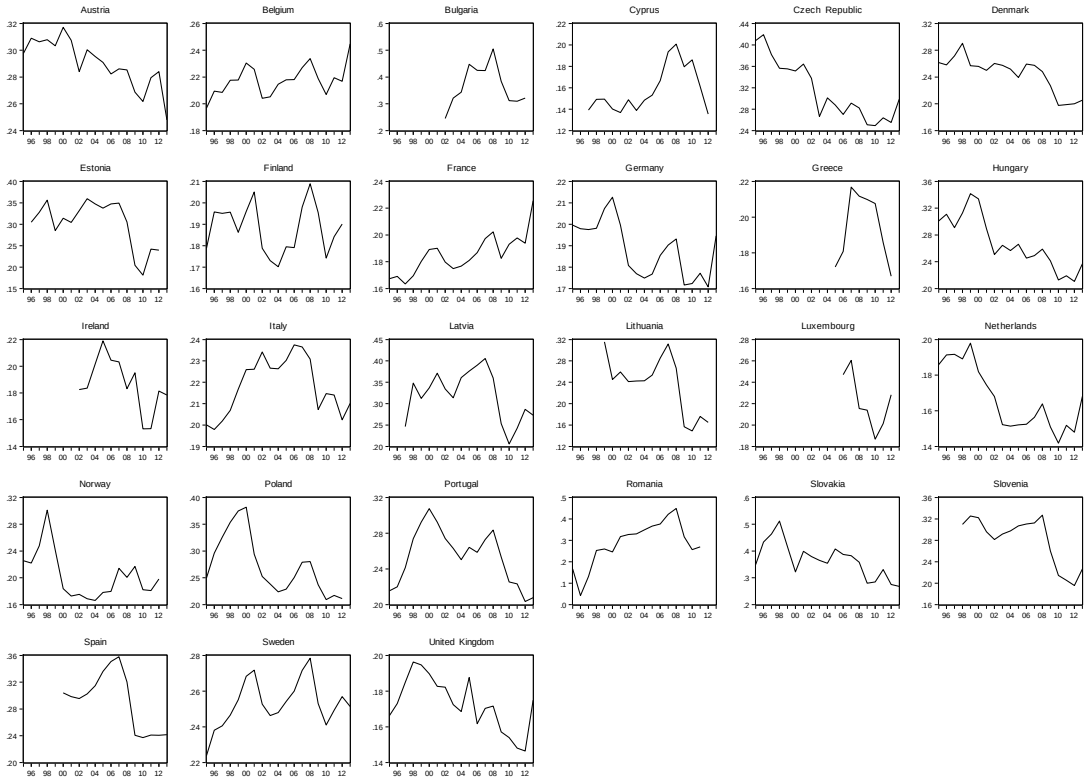
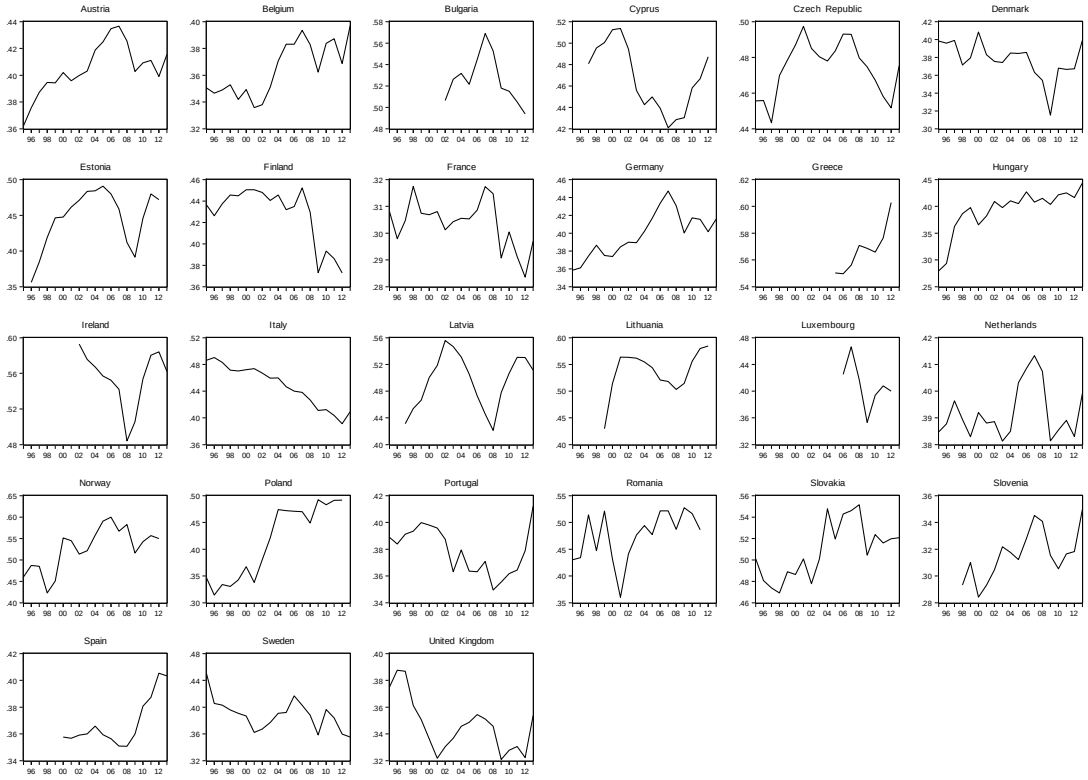


Figure A14 – Investment of NFCs (% of gross value added of NFCs)



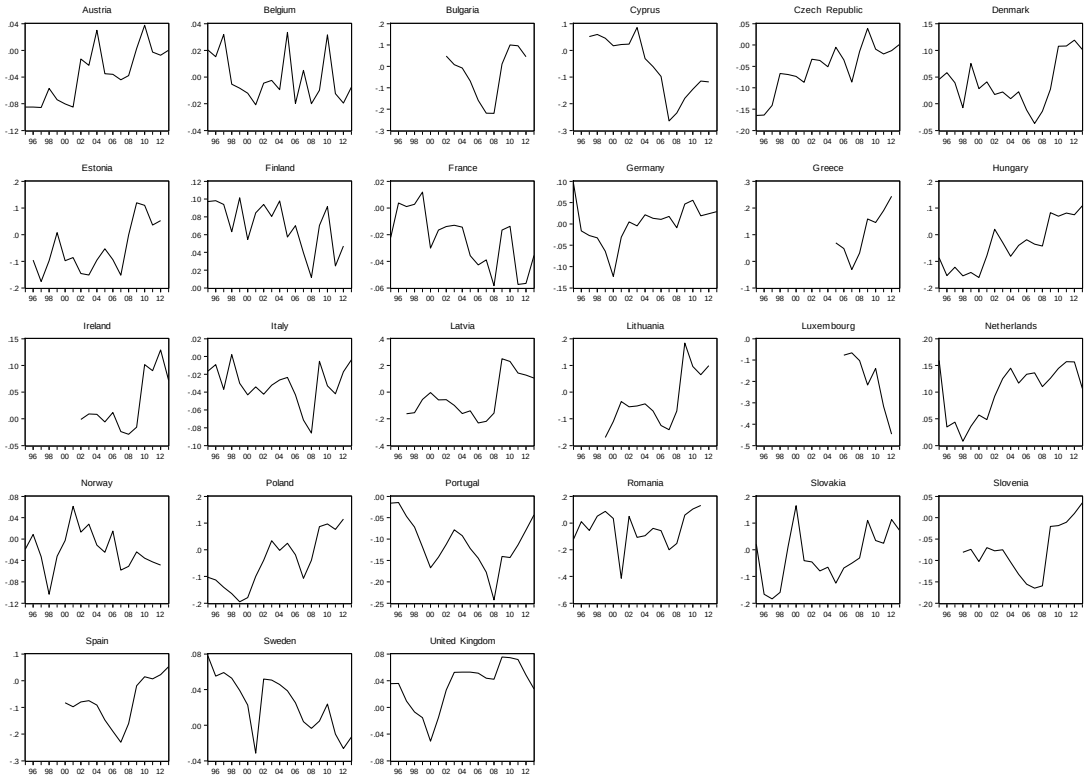
Source: Eurostat and national statistic offices (Annual Sector Accounts)

Figure A15 – Profitability of NFCs (% of gross value added of NFCs)



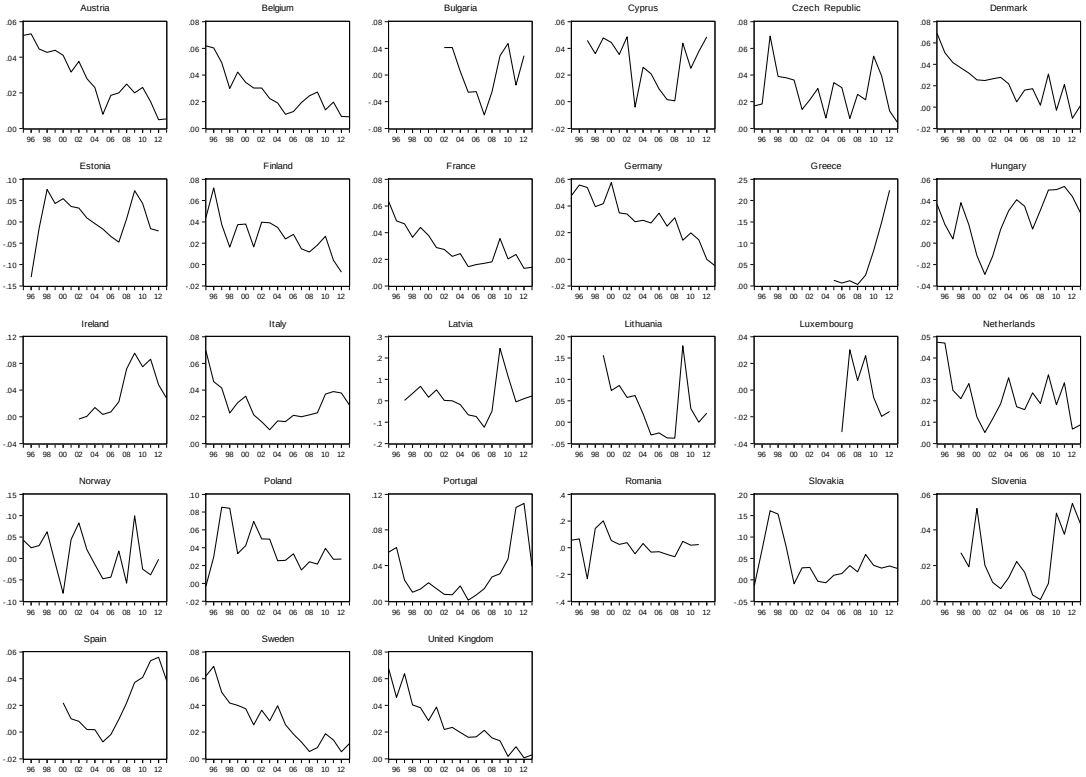
Source: Eurostat and national statistic offices (Annual Sector Accounts)

Figure A16 – Debt of NFCs (% of gross value added of NFCs)



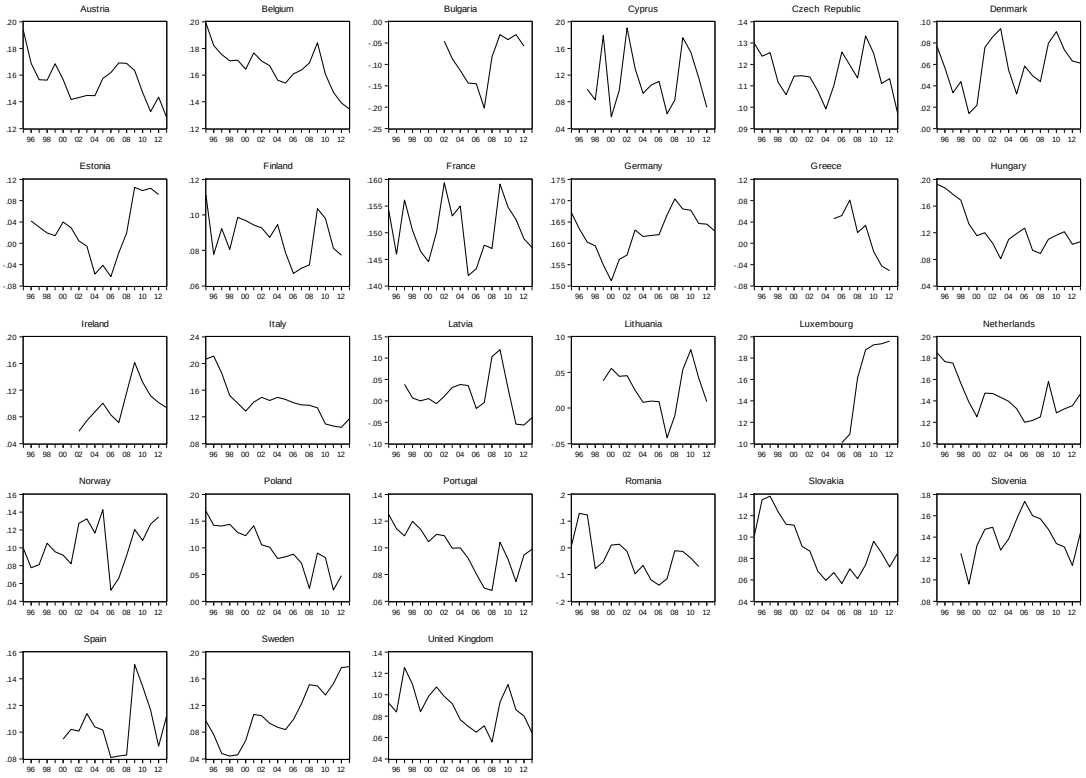
Source: Eurostat and national statistic offices (Annual Sector Accounts)

Figure A17 – Cost of capital (%)



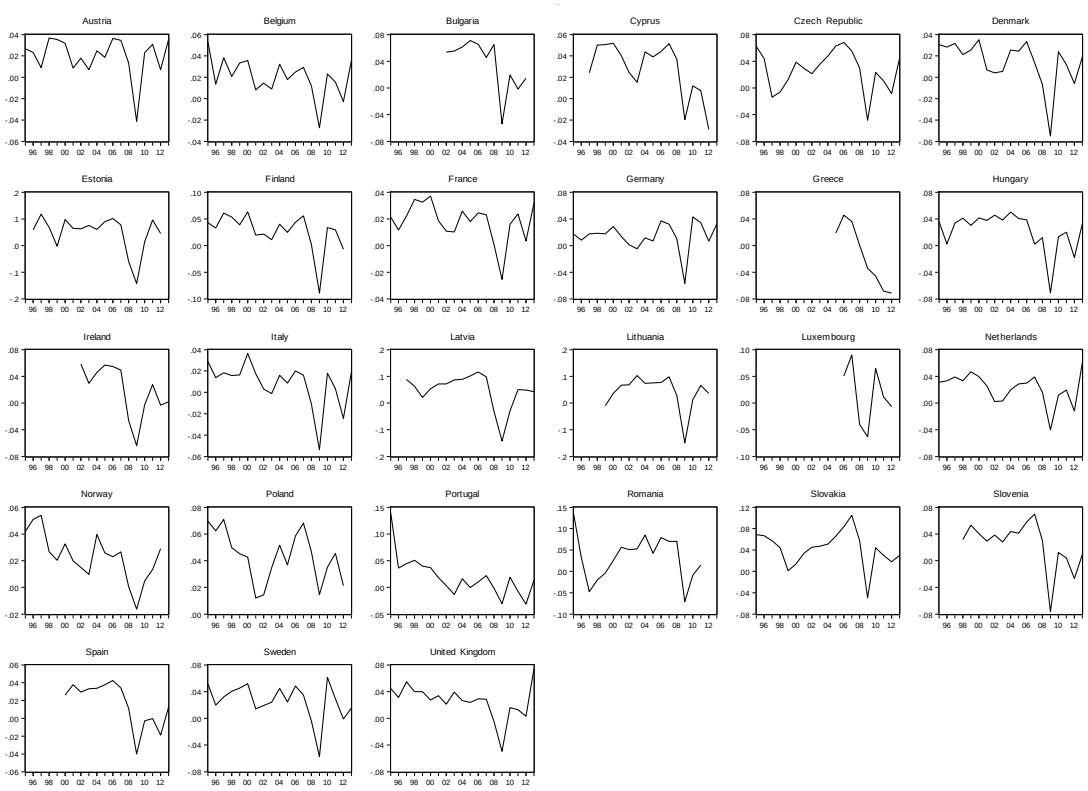
Source: AMECO

Figure A18 – Savings rate (% of disposable income)



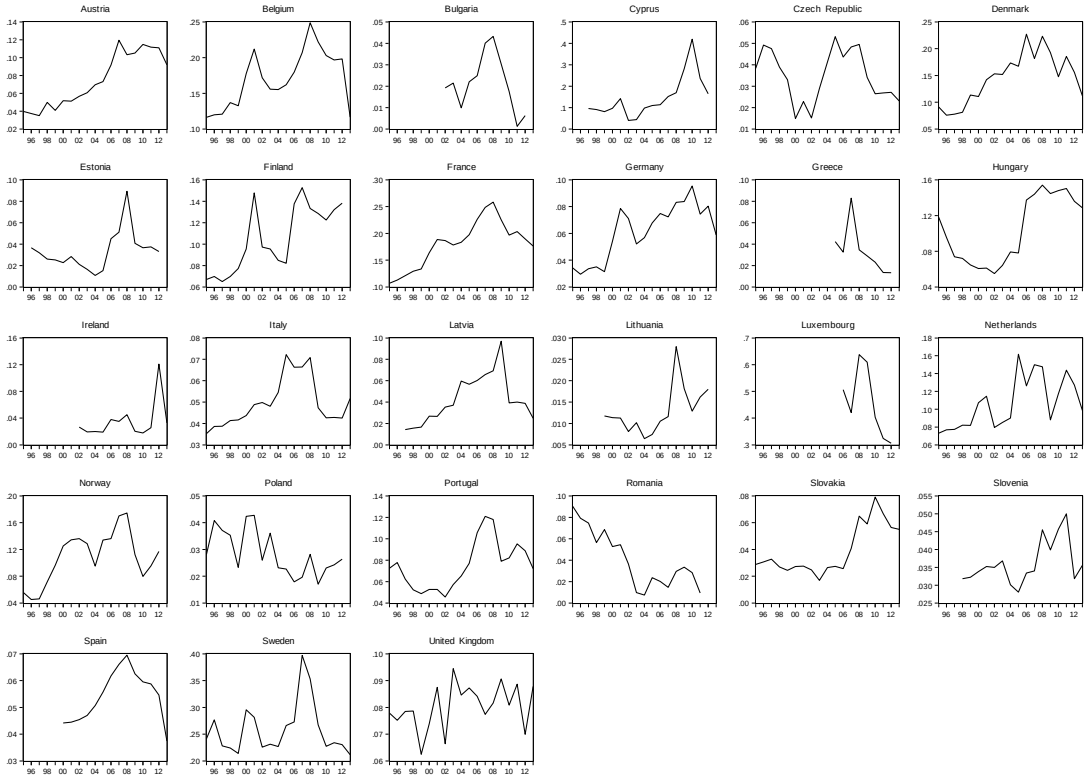
Source: AMECO

Figure A19 – Output growth (annual growth rate)



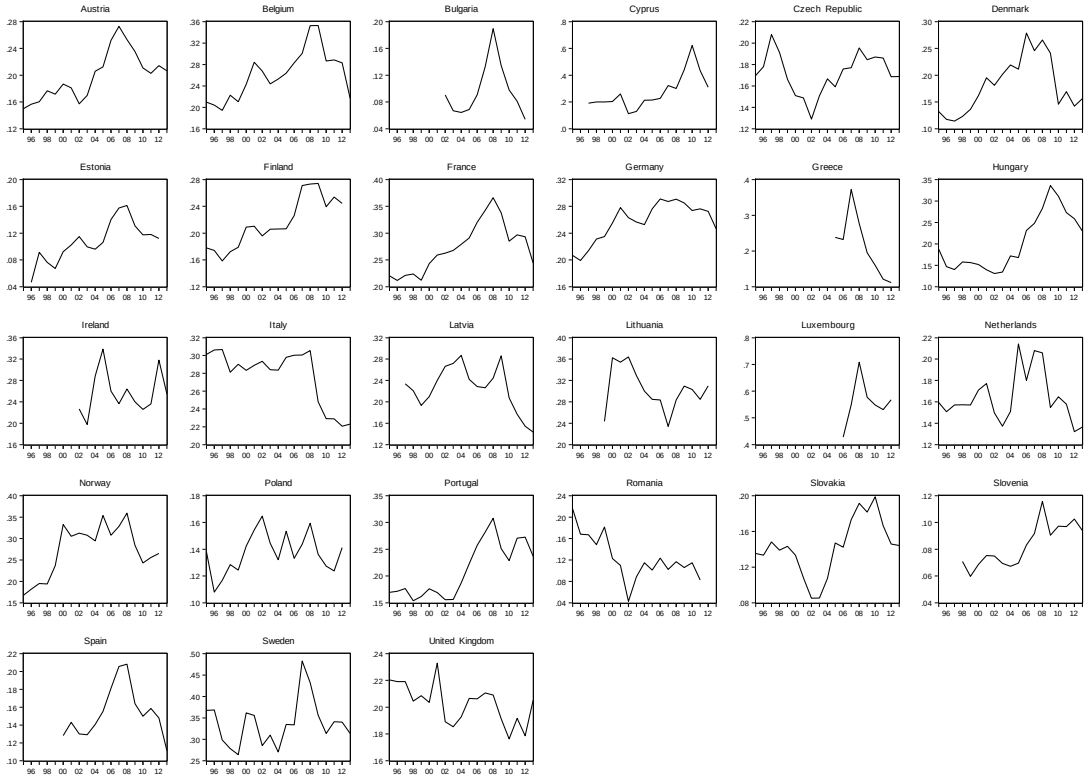
Source: Eurostat

Figure A20 – Financial receipts of NFCs (% of gross value added of NFCs)



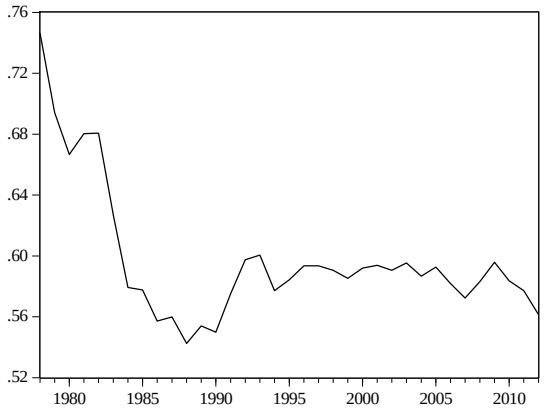
Source: Eurostat and national statistic offices (Annual Sector Accounts)

Figure A21 – Financial payments of NFCs (% of gross value added of NFCs)



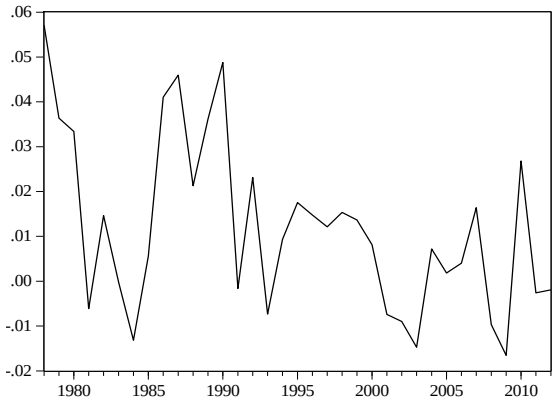
Source: Eurostat and national statistic offices (Annual Sector Accounts)

Figure A22 – Labour income share (% of GDP)



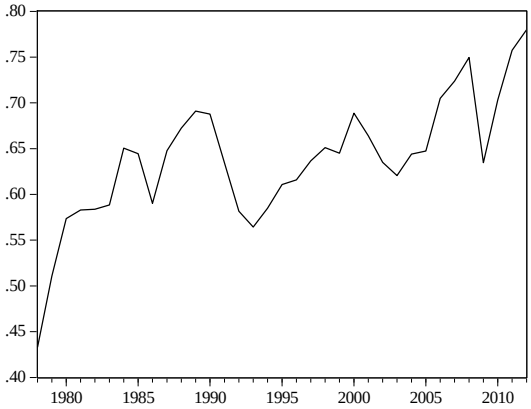
Source: AMECO

Figure A23 – Technological progress (annual growth rate)



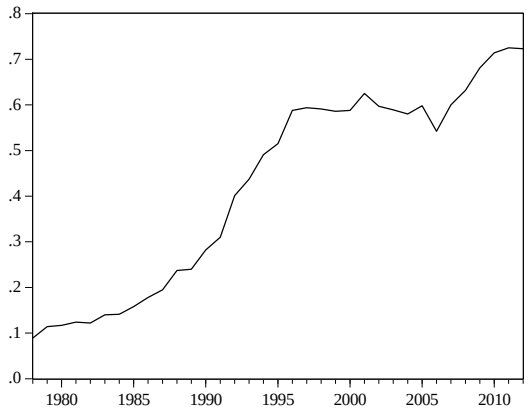
Source: AMECO

Figure A24 – Globalisation (% of GDP)



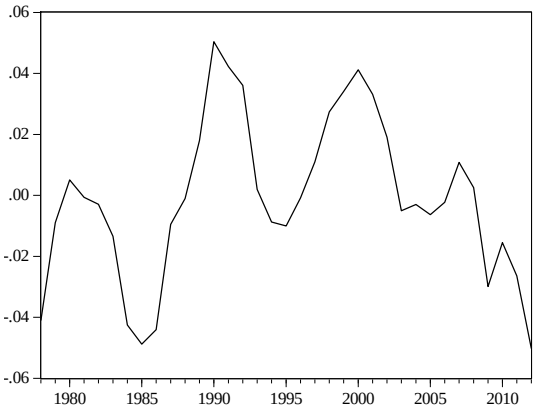
Source: *Instituto Nacional de Estatística*

Figure A25 – Education of the labour force (%)



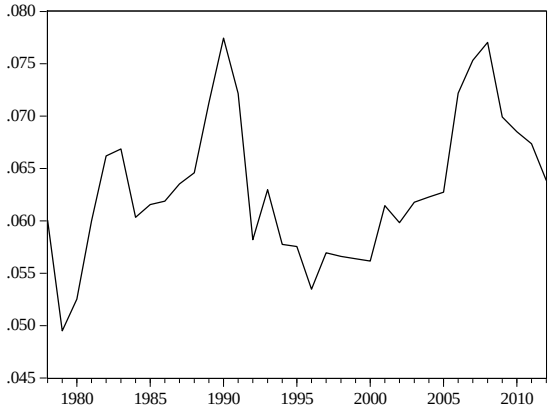
Source: PORDATA

Figure A26 – Business cycle (%)



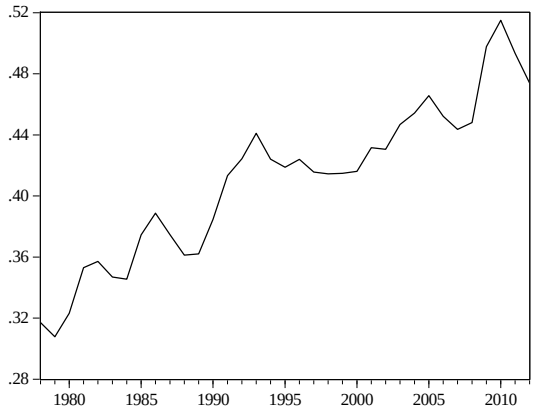
Source: AMECO

Figure A27 – Financial activity (% of gross value added of total economy)



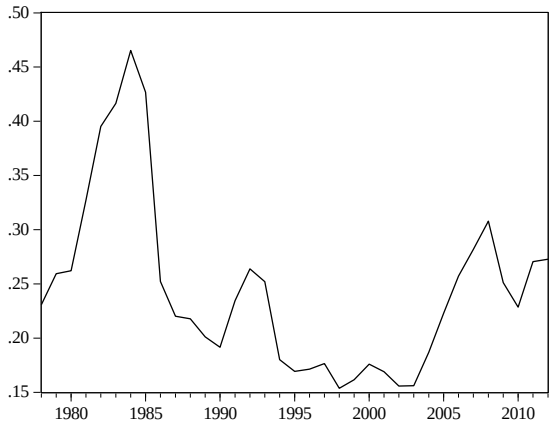
Source: PORDATA and Eurostat

Figure A28 – Government activity (% of GDP)



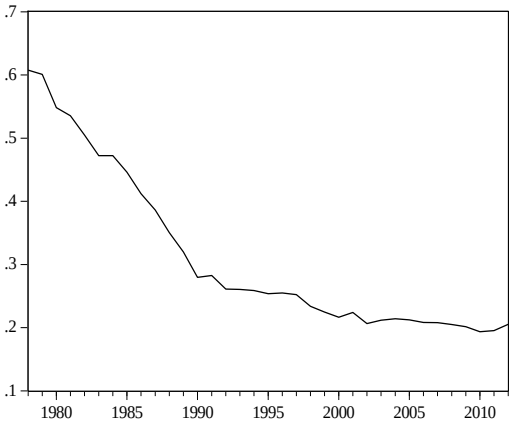
Source: AMECO

Figure A29 – Shareholder orientation (% of gross value added of NFCs)



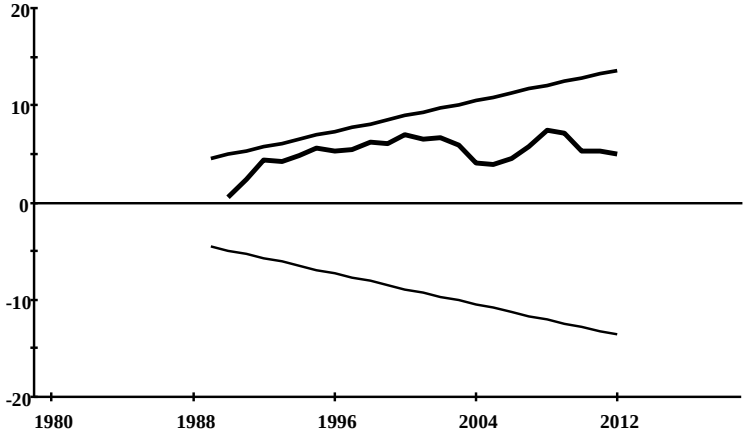
Source: *Instituto Nacional de Estatística* (Annual Sector Accounts)

Figure A30 – Trade union density (%)



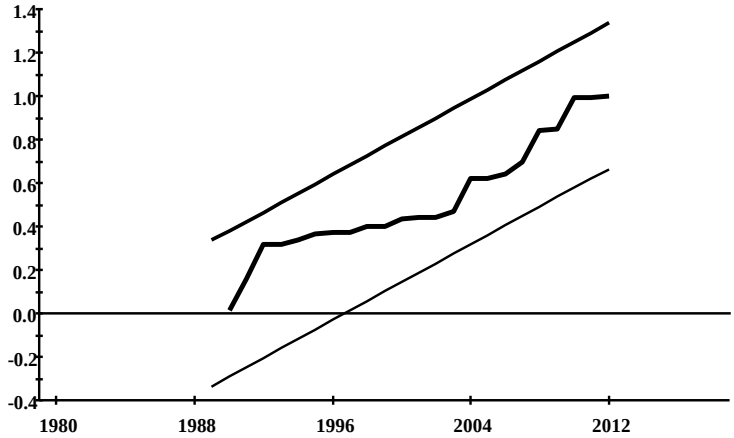
Source: OECD (Labour Force Statistics)

Figure A31 – CUSUM of recursive residuals (short version)



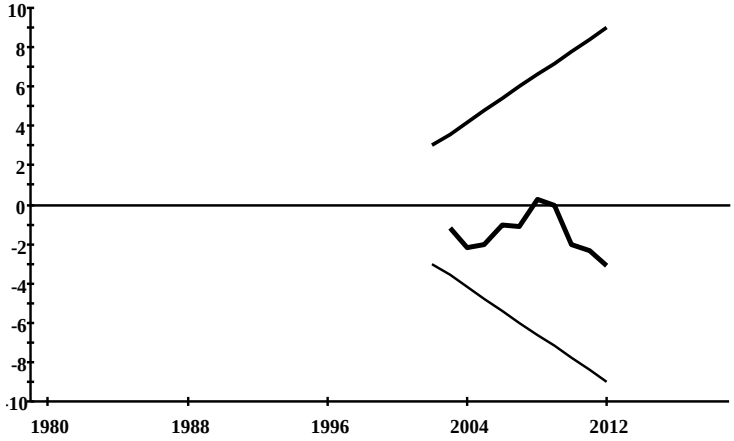
Note: The straight lines represent critical bounds at 5% significance level

Figure A32 – CUSUMSQ of recursive residuals (short version)



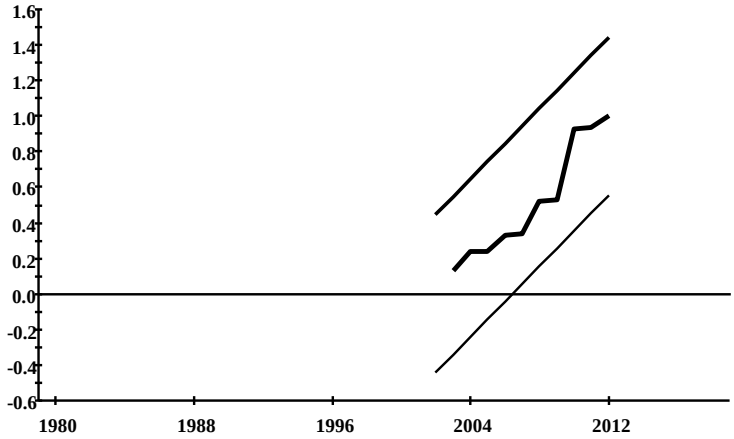
Note: The straight lines represent critical bounds at 5% significance level

Figure A33 – CUSUM of recursive residuals (long version)



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

Figure A34 – The plot of CUSUMSQ of recursive residuals (long version)



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