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Functional Income Distribution and Short-Run Growth: A Keynesian-Kaleckian Approach to Southern Europe Pre- and Post-GFC

Pedro Tomás de Oliveira Antunes

Master in Political Economy

Supervisor:

Ph.D. Ana Cristina Narciso Fernandes Costa, Associate Professor,
ISCTE – Instituto Universitário de Lisboa

Co-Supervisor:

Ph.D. Joaquim José dos Santos Ramalho, Full Professor,
ISCTE – Instituto Universitário de Lisboa

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CIÊNCIAS SOCIAIS
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Department of Political Economy

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À minha mãe, o meu mundo e o meu propósito, Maria R.L. Oliveira.

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RESUMO

Na Europa, em geral, e na Europa do Sul, particularmente, o rendimento que flui para proprietários de capital, em detrimento de trabalhadores, tem aumentado gradual e significativamente desde a década de 1980. Os economistas políticos debatem desde sempre se uma repartição funcional do rendimento mais favorável aos trabalhadores ou, pelo contrário, aos capitalistas, promove crescimento macroeconómico. Muitos consideram que as economias europeias beneficiam mais com a primeira opção, sugerindo a adoção de políticas trabalhistas. Contudo, é escassa a investigação sobre dinâmicas de curto prazo de mudanças na repartição funcional do rendimento. A Europa do Sul é uma região adequada para estudar o tema, visto que Portugal, Grécia, Itália e Espanha seguiram uma trajetória macroeconómica semelhante antes, durante e após a crise financeira global (CFG). Assim, para preencher esta lacuna, esta dissertação propõe responder à pergunta: Em que medida é que a componente do salário estimula o crescimento na Europa do Sul, e como podem variáveis *Kaleckianas* ajudar a explicar o seu progresso de curto prazo? A principal ferramenta metodológica utilizada para responder à pergunta de partida é uma regressão de dados de painel de efeitos fixos, utilizando dados de 1993 a 2023. Este modelo inclui determinantes de crescimento *pós-Keynesianos* e *Kaleckianos*. Sugere-se que o efeito da componente do salário no crescimento depende dos níveis de investimento e cobertura da negociação coletiva. Adotar políticas favoráveis aos trabalhadores na Europa do Sul é, portanto, aconselhado aos respetivos governos.

Palavras-Chave: Crescimento económico de curto prazo, Europa do Sul, componente do salário, crise financeira global, economia *Kaleckiana*, economia *pós-Keynesiana*.

Classificação JEL: D33, O43.

ABSTRACT

In Europe, in general, and in Southern Europe, in particular, the share of income going to capital owners, at the expense of workers, has gradually but significantly increased since the 1980s. Political economists have long debated whether distributing more income to workers or to capitalists is more beneficial for macroeconomic growth. Many have concluded that the European economies benefit more from the former, hence suggesting the adoption of pro-labor policies. There is, however, little to no research on the short-run dynamics of these shifts in functional income distribution. Southern Europe is an interesting region to study, as Portugal, Greece, Italy, and Spain have all followed a similar macroeconomic trajectory before, during, and after the Global Financial Crisis (GFC). To fill this gap, this dissertation proposes to answer the research question: To what extent does the wage share stimulate growth in Southern Europe, and how can Kaleckian variables help explain its short-term progress? The main methodological tool used to answer the research question is a fixed-effects panel data regression, utilizing data from 1993 to 2023. The model included post-Keynesian and Kaleckian determinants of growth. The outcomes demonstrate that the impact of the wage share on output growth depends on investment levels and the extent of collective bargaining coverage. The adoption of more pro-labor policies by Southern European governments is, therefore, recommended.

Keywords: Short-term economic growth, Southern Europe, wage share, Global Financial Crisis, Kaleckian economics, post-Keynesian economics.

JEL Classification: D33, O43.

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CHAPTER I

INTRODUCTION

Europe has visibly experienced a progressive decline in the wage share over the last few decades, which has encouraged new discussions on the relationship between income distribution and economic growth. Whereas neoclassical theories often advocate wage restraint as a means to enhance competitiveness and attract investment, post-Keynesians have argued that higher wage shares can stimulate consumption and support growth through aggregate demand. More recent studies, namely those by Alcobia and Baradas (2023; 2024), have successfully established that the decrease in the wage share observed across EU countries has hindered growth.

In spite of these developments, some gaps remain in the literature. First, the majority of the empirical research evaluates the EU as a monolith *per se*, frequently overlooking region-specific tendencies. Southern European economies, defined by weak demand, segmented labor markets, and EMU constraints (Matthijs, 2014), may respond differently to changes in the income distribution compared to Central Europe. Moreover, research by Stockhammer (2009) and Hein (2012), for example, examines long-run tendencies but does not extensively focus on short-term shocks caused by business cycles, public policy changes, and exogenous influences. Lastly, class relations, bargaining coverage, and investment patterns, fundamental to Kalecki (Kalecki, 1971; Hein, 2006), are usually not combined with Keynesian determinants of growth. These gaps in the literature frame the main proposal of this body of work.

To address these identified gaps, the current dissertation examines the short-term impact of wage share changes on the rate of GDP growth in Southern Europe, specifically Greece, Portugal, Italy, and Spain. This dissertation approaches them by applying a hybrid econometric model, combining Kaleckian and post-Keynesian variables; these not only include determinants of growth, but also *controls* for structural factors that may affect their impact on output growth. Hence, this investigation combines collective bargaining coverage and gross fixed capital formation as Kaleckian proxies, alongside post-Keynesian *controls* such as public spending and domestic credit, while having wage share as the main explanatory variable.

The research considers the period between the 1990s and the present, which encompasses three distinct periods: The pre-Global Financial Crisis (or GFC) years, the Troika-led adjustment period, and the subsequent phase of stabilization and recovery. These pivotal periods are of particular relevance to

Southern Europe, since the crisis led to changes in the distribution of income, which rapidly skewed towards the capital owners (Matthijs, 2014; Perez and Matsaganis, 2018).

The main research question is: To what extent does the wage share stimulate growth in Southern Europe, and how can Kaleckian variables help explain its short-term progress? To answer this question, this research utilizes Stata 18 and employs a fixed-effects panel data regression that incorporates first-differenced variables. This methodological choice aims to capture short-run tendencies by controlling unobserved heterogeneity.

In tackling the problem, this thesis situates itself within the extensive literature on wage-led and profit-led growth regimes (Baccaro and Pontusson, 2016; Stockhammer, 2016) and seeks to contribute to the understanding of distributional patterns within demand-constrained economies. The contribution is, however, twofold: Theoretically, it attempts to integrate Kaleckian institutional and investment aspects within a post-Keynesian framework, and empirically, it focuses on Southern European economies as a singular case within the EU. Aside from contributing to further theoretical debates, its results also have policy relevance, particularly in helping to comprehend short-term shocks in demand-led economies, bearing in mind the impact of wages, bargaining institutions, and investment on economic growth; as a result, conclusions derived from the current research could allow for the design of more robust and inclusive growth strategies by the Southern European governing bodies.

The outcomes of the model converge with Alcobia and Barradas' (2023; 2024) findings about the long-run. It shows that the short-run situation in Southern Europe captures very particular dynamics. The impact of wage share on growth heavily relies on investment levels and collective bargaining coverage. These outcomes emphasize how important Kaleckian mechanisms are for short-term growth and show that distributional policies need to be accompanied by a solid structural environment. Additionally, they seem to indicate that these economies are wage-led, or demand-led, as far as increases in the wage share appear to be important drivers of economic growth.

CHAPTER II

PERSPECTIVES ON FUNCTIONAL INCOME DISTRIBUTION

In 2024, Alcobia and Barradas published a paper that examined the impact of wage share on economic growth in the European Union (EU) from 1981 to 2021. They identify evidence supportive of the wage-led growth hypothesis, which suggests that accelerations in the wage share benefit long-run growth. It is consistent with the post-Keynesian thought, which argues that aggregate demand drives growth and claims that a higher wage share accelerates consumption rather than decreases investment and net exports (Alcobia and Barradas, 2024). These results contradict neoclassical advocacy in favor of wage containment policies, claiming that the continued decline in the wage share observed across Europe since the 1980s has been a primary factor behind its sluggish growth. This research seeks to examine the short-term impact of changes in the wage share on GDP growth in Southern Europe, specifically. It complements Alcobia and Barradas' research and extends their model with Kaleckian economic theory.

In short, this work proposes to answer the question: To what extent does the wage share stimulate growth in Southern Europe, and how can Kaleckian variables help explain its short-term progress? Through combining Kaleckian perspectives on investment behavior into the post-Keynesian, demand-oriented factors, the integrated model intends to look at how the distribution of functional income affects growth in Southern Europe. Economies in Southern Europe suffer from weak demand and fragmented labor markets (Matthijs, 2014), suggesting that the connection between income distribution and growth might differ from that in Northern and Eastern Europe, which justifies a hybrid approach. Additionally, concentrating just on Southern European nations, instead of the whole EU, seeks to reduce structural heterogeneity.

Alcobia and Barradas (2024) adopted a panel autoregressive distributed lag (ARDL) model for estimation. They selected variables advised by post-Keynesian literature, where six important determinants of growth have been highlighted: Wage share, property prices, valuation of financial assets, credit, public expenditure, and non-price competitiveness (Alcobia and Barradas, 2024). These variables reflect the core components of aggregate demand and their respective susceptibility to modifications in income distribution.

This thesis will further extend the post-Keynesian model by adding Kaleckian variables like collective bargaining coverage and fixed capital formation, which will be addressed subsequently. These variables may help explain why income distribution diverges across economies under similar

macroeconomic conditions. Alcobia and Barradas' paper distinguishes short- and long-run impacts. However, due to the modest number of cross-sectional units and the longer time horizon, a fixed-effects model with first-differenced variables was favored to estimate short-term effects within units. Although this method confines the investigation to short-run trends, it is the most appropriate consideration for the data structure. More justification is included in the *Methodology* section.

The short-term performance of Southern European economies has been characterized by conjunctural shocks, cyclical volatility, and irregular policy adjustments, particularly in the aftermath of the financial crisis and under the constraints of EMU membership. These dynamics are especially relevant when studying the evolution of GDP and income distribution over time. While long-term transformations, such as changes in sectoral composition or institutional settings, are equally relevant, the use of a fixed-effects model with first-differenced variables in panel data helps remove unobserved, time-invariant heterogeneity, ensuring that estimates reflect the within-unit variation over time (Wooldridge, 2010). As Hsiao (2022) states, first-differencing is particularly useful for examining short-run aspects, as it focuses directly on changes instead of levels. This method is designed to capture the immediate impact of changes in wage share and investment fluctuations on economic growth, which is particularly pertinent given the frequent and intense policy changes in the region. To evaluate the relationship between wage share and growth, however, it is necessary to define how income distribution is understood in economic theory.

Functional income distribution illustrates how economic output is divided among the factors of production, namely capital and labor (Dünhaupt, 2013). The labor share, also known as the wage share, can be understood as workers' compensation as a percentage of GDP. What remains, known as capital or profit share, is accrued to capital owners, although it can also include other types of income, depending on the measurement method. Hence, the labor share responds to changes in the growth rate of real wages and productivity. When real wages grow faster than productivity, the labor share increases; when they do not keep pace with productivity gains, profit share surges. Political economists have long studied income distribution, with many theories developed over time (Razgūnė and Lazutka, 2015).

Ricardo and Marx both believed that functional income distribution fluctuates over time. However, Ricardo saw it as a result of rising wages due to the scarcity of fertile land (Nunes, 2016), whereas Marx attributed it to changes in the composition of capital (Marx, 2018). To these economists, sources of revenue relate to their respective social classes: Landlords receive rent, capitalists receive profits, and workers receive wages (Dünhaupt, 2013). Karl Marx (2018) contended that the division between capital and labor was the basis of the capitalist mode of production.

According to Ricardo, as cultivation expands to less fertile land, diminishing returns raise food prices, leading to elevated nominal wages (because the cost of living was measured in corn) and

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increased rents on fertile land, which together reduce the rate of profit over time (Nunes, 2016). Ricardo also accepted Malthus' population theory, which suggests that if wages rise above the "natural subsistence level", it leads to higher birth rates, increasing the labor supply. As the population and the wage fund grow, the demand for corn upsurges, driving up rents at the expense of profits, with any surplus revenue absorbed by the extra costs (Kaldor, 1955; Siebke, 1999). For Marx, the degree of exploitation during production is dependent on the rate of surplus value, which is the surplus produced relative to wages. To him, the value of labor depends on the living conditions and the bargaining power between capitalists and workers (Marx, 2018). Thus, class struggle regulates how income is distributed.

The neoclassical approach to functional income distribution focuses on resource allocation and factor prices (wages and profits). It argues that each factor of production is paid according to its marginal product. That is, how much added value, or output, each contributes to the production process, with factor prices influenced by the forces of supply and demand in a perfectly competitive market (Razgune and Lazutka, 2015). For example, if labor supply increases, the price (wage) may decrease; if the demand for work surges, wages could instead go up. This perspective culminates in the theory of marginal productivity, which operates under the premise of competitive markets that facilitate efficient distribution. It overlooks Marx's assertion that employers take advantage of the surplus labor force (termed the industrial reserve army) to inhibit wage growth, irrespective of demand fluctuations. Therefore, to the neoclassical economists, profits and wages depend on factors' scarcity, preferences, and productivity (technology).

This relationship can be represented by a Cobb-Douglas production function, where capital and labor are shaped by production technology, increasing their marginal products to benefit employees and employers equally from technological progress (Kristal, 2010). In neoclassical economics, factor substitution, meaning replacing one input with another to maintain efficiency, helps to balance savings and investment (Kristal, 2010). Accordingly, if the elasticity of substitution between capital and labor is 1 (one), meaning they are interchangeable, and there are constant returns to scale (no diminishing returns) as in the Cobb-Douglas model, relative factor shares should stay stable. In fact, until the end of the 20th century, neoclassical economists observed stable factor shares over an extended period; hence, the constancy of the factor shares was more implied than explained by the marginal productivity theory (Razgūnė and Lazutka, 2015).

Nonetheless, as observed by Barradas (2019), the constancy of factor shares over time has been presumed by traditional, or orthodox, theories; it is even considered a stylized fact of economic growth (Kaldor, 1961), or a law (Krämer, 1996). The constancy of factor shares over time has, however, been questioned more recently, particularly due to concrete evidence of the downward trend in the labor share since the 80s (Alcobia and Barradas, 2023), which will be addressed in the upcoming section. In 1776, Smith had already concluded that the labor share is inconsistent over time by reflecting a balance

of the bargaining power between workers and capitalists, but also broader institutional elements, like labor laws, as later corroborated by Marx. Because labor share fluctuates due to shifting power dynamics and institutions, the idea of constant factor shares was, according to Alcobia and Barradas (2023), considered a mirage by Keynes (1939) and, to Solow (1958), something akin to a miracle.

In addition to theory, understanding the empirical relationship between labor share and growth is crucial. There is considerable research on the impact of changes in functional income distribution on economic growth, as pointed out by Alcobia and Barradas (2023). Orthodox models in macroeconomics assume that income distribution has no long-term impact on growth, which is determined only by supply-side factors (Romer, 1986; Aghion, Howitt, Brant-Collett, and García-Peñalosa, 1998). Therefore, policies that promote technological progress or enhance wage and price flexibility are often designed to foster job creation and encourage potential growth, while simultaneously helping to contain inflationary pressures (Alcobia and Barradas, 2023). These assumptions have led many governments to adopt pro-capital policies, such as labor market flexibilization, corporate tax cuts, weakened collective bargaining, union suppression, and deregulation (Lavoie and Stockhammer, 2013).

In contrast, macroeconomic models developed by post-Keynesian economists, such as Kaldor (1961) and Pasinetti (1962), have a different interpretation. According to Razgūnė and Lazutka (2015), these theories are frequently referred to as heterodox rather than Keynesian, as Keynes himself did not explicitly concentrate on income distribution (Giovannoni, 2014). Keynes focused instead on the short-term effects of output and employment, as noted by Stockhammer (2009). Nonetheless, Keynes stipulated valuable suggestions regarding the impacts of income distribution on employment and the level and composition of aggregate demand (Razgūnė and Lazutka, 2015). Keynes assumed diminishing marginal returns under conditions of full employment: Once the economy reaches its maximum capacity, upsurges in output elevate prices instead of employment, which leads to an inverse relationship between employment and the purchasing power of wages, and between labor share and aggregate demand (Razgūnė and Lazutka, 2015; Kregel, 1978).

Post-Keynesians, as well as Kalecki (2013), from a Marxian perspective, posited that since the marginal propensity to save through profits is higher, the transfer of income from capital to labor could lead to an upsurge in private consumption. In addition, regarding private investment, Kalecki notes that there are two contradictory effects: On the one hand, wages constitute a substantial increase in corporate costs, which depresses private investment, and on the other hand, wages are an extra source of demand, which boosts private investment (Alcobia and Barradas, 2023). Neoclassical economists argue that investment depends solely on prior savings, while post-Keynesians contend it is primarily driven by aggregate demand. Therefore, according to post-Keynesians, businesses invest based on the expectation of future demand (marginal efficiency of capital) instead of waiting for savings to accumulate.

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As Stockhammer (2009) notes, in post-Keynesian models, labor demand is molded by technology and labor supply by social preferences. Because the productive capacity of corporations is not fully utilized, they are capable of suddenly expanding production to meet the relevant upsurges in aggregate demand (Alcobia and Barradas, 2023). Therefore, for a certain level of output, an increase in the labor share results in lower profit margins for corporations (profitability effect), although the level of capacity utilization may increase as they produce more to meet higher demand (acceleration effect). Importantly, when the acceleration effect is greater than the profitability one, private investment increases; when the profitability effect offsets the acceleration effect, investment declines. The literature frequently distinguishes between two growth models created under these assumptions: A wage-led regime (or demand-led), connected with the former, and a profit-led regime, related to the latter (Alcobia and Barradas, 2023).

Additionally, post-Keynesians have noted that an upsurge in labor share tends to harm net exports. This occurs because reductions in profit margins can lead to some exporters losing external competitiveness or becoming economically unviable, while the higher labor share tends to increase imports (Alcobia and Barradas, 2023). Moreover, post-Keynesians, according to Stockhammer (2009), assumed that, since the propensity to save from profits is higher, then total investment divided by national output should account for the profit share in the national income (Kaldor, 1961). This means that post-Keynesian theories look at factor shares as being endogenously influenced by the investment behavior of firms, which has led to considerable criticism (Razgūnė and Lazutka, 2015).

Kaldor, notably a post-Keynesian economist, is primarily criticized for making overly restrictive assumptions (Razgūnė and Lazutka, 2015). He presumed that the productivity of capital and labor, the capital-to-labor ratio, and income distribution are constant over time. Pasinetti (1962) revised Kaldor's model by allowing workers to receive profits, which means their overall propensity to save differs from the propensity to save out of wages. While workers' saving conduct can affect the distribution of profits between classes, it does not alter the overall functional income distribution (Razgūnė and Lazutka, 2015). Kaldor's main argument is that income distribution is connected with the investment rate, a demand-side variable, since capital share is contingent on the investment-output ratio, tying his model to demand-driven explanations (Giovannoni, 2014).

Neoclassical economics typically assumes full employment and perfect competition, whereas post-Keynesians reject these assumptions, focusing instead on demand restrictions and market imperfections (Razgūnė and Lazutka, 2015). As Stockhammer (2009) avers, full employment is a core assumption in neoclassical economics. Once this presumption is relaxed, the relationship between wages and the marginal product of labor becomes less clear. Marxian economists have made relevant contributions to the investigation of income distribution in light of this. Goodwin, for instance, stresses class

struggle as a major determinant of income distribution and treats labor share as an inverse function of unemployment (Barbosa-Filho and Taylor, 2006).

Kalecki (2013) relaxed some of the aforementioned assumptions. To him, the economy did not naturally gravitate towards full employment. He also allowed for imperfect competition, assumed that firms can have the market power to set prices that are not responsive to demand changes, by producing below full capacity, and suggested that state policies can influence distribution (Stockhammer, Onaran, and Ederer, 2009). Kalecki's (1971) model stood out from others at the time because it did not rule out fluctuations in the functional income distribution.

Kalecki's theory of income distribution connects it to the pricing conduct of firms in the industrial sector, assuming underemployment and imperfect competition (Dünhaupt, 2013). He contends that costs influence prices in the industrial sector, whereas in the primary sector, they are determined by the demand (Kalecki, 1971). Kalecki also argued that firms do not operate at full capacity, and that the cost of materials and wages per unit of output (unit variable costs) remains constant within a specific range of production. Firms then add a profit margin to the costs, based on how much control they exert over the market, meaning their degree of monopoly (Kalecki, 1971). Hence, the income distribution in the industrial sector is determined by the average profit margin (degree of monopoly) and the ratio of raw material costs to wages. The profit share, however, must still cover costs like wages and capital depreciation. Accordingly, the wage share is influenced by the profit margins set by firms, the ratio of material costs to wages, and the structure of the different sectors (Dünhaupt, 2013).

Kalecki (1971) identified four factors that determine the degree of monopoly. First, the markup increases when there is higher market concentration, leading to less price competition. Second, a higher degree of monopoly is linked to non-price competition, such as advertising and sales promotions. Third, overhead costs, like prime costs (basic costs of production), can also affect the degree of monopoly. If these prices increase and profits decline, firms might seek to raise prices through informal agreements. Fourth, the power of trade unions: When unions push for higher wages, firms may raise prices to maintain their profit margins, which could hurt their competitiveness (Kalecki, 1971). Kalecki (1971) posited that under certain circumstances, wage upsurges may not result in higher prices but could instead reduce profits. This is especially true in an open economy, where international competition limits firms' ability to raise prices without losing competitiveness (Dünhaupt, 2013).

More recently, Bertola, Foellmi, and Zweimüller (2005) expanded the discussion on functional income distribution by connecting growth models, such as Harrod-Domar and the neoclassical growth model, to practical issues, including the impact of factor shares on saving behavior. They also discussed the task of taxation in shaping distribution and growth. Bertoli and Farina (2007) examined factors such as sectoral composition, technological advances, and institutional settings, suggesting a positive

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relationship between the capital share and economic growth. However, some empirical studies (Dühnaupt, 2013; Alcobia and Barradas, 2024) challenge this assertion by pointing to the recent sluggish growth in EU countries. Taking from this, Hein (2012; 2013) incorporated financialization (the enlarged influence of the financial market) into Kaleckian models, claiming that financial markets and liberalization have contributed to the decline of labor shares in advanced economies since the 80s.

BROAD TRENDS IN THE DISTRIBUTION OF LABOR INCOME

As noted by Alcobia and Barradas (2023), empirical research examining the connection between economic growth and labor share normally adopts one of two approaches. The first is the structural approach, which regards functional income distribution as exogenous and estimates the impact of changes in the labor share on private consumption, investment, and net exports separately (Gordon, 1995; Stockhammer *et al.*, 2009; Naastepad, 2006; Naastepad and Storm, 2006; Obst, Onaran, and Nikolaidi, 2016; Ederer and Stockhammer, 2007; Stockhammer, 2009). The second one is the aggregative approach, which assesses the direct impact of changes in the labor share on aggregate demand (Barbosa-Filho and Taylor, 2006; Stockhammer *et al.*, 2009; Nikiforos and Foley, 2012; Teixeira, Missio, and Dathein, 2022).

This section now turns to empirical trends in the wage share and growth across the West, with a particular focus on Portugal, as a Southern European country. Like most developed countries, Portugal has experienced slow and declining growth rates in recent decades (Barradas, 2020; 2022; Morlin, Passos, and Pariboni, 2024). This trend has been widely observed and is now considered a stylized fact of economic growth (Krugman, 2014; Summers, 2016; Morlin *et al.*, 2024). Alcobia and Barradas (2024) recently showed that the wage share in every EU economy has steadily declined from 1981 to 2021, a period marked by weak economic growth. This aligns with heterodox economists who support the view that public policies influenced by Reaganomics and Thatcherism, such as wage restraint, harm growth by reducing household consumption more than they boost private investment and net exports (Naastepad and Storm, 2006; Alcobia and Barradas, 2023; Jungmann, 2021).

Razgūnė and Lazutka (2015) found that the labor share in the Baltic countries has mirrored the downward trend seen across Europe, although with greater short-term volatility. Compared to other EU economies, labor share levels in the Baltic region remain low. Gollin (2002) showed that much of the disparity in wage shares between poorer and richer countries diminishes once adjustments are made for the income of self-employed workers. Since Johnson (1953), it has become the standard to allocate two-thirds of proprietors' income (i.e., income earned by owners of unincorporated businesses) to the labor

share and one-third to the capital share (Krueger, 1999). Nonetheless, a further complication arises in how public sector income is treated: As Gomme and Rupert (2004) note, because the government sector has no profit component by default, reductions in its activity (holding all other variables constant) always lower the labor share.

In 2007, Willis and Wroblewski proposed three potential explanations for why the labor share tends to fluctuate with the business cycle, increasing during a recession and declining during the recovery period. First, wages require some time to adjust. Second, adjustments in employment can be expensive. Hence, firms usually prefer to delay the adjustment until they can be sure the change in demand is permanent. Finally, the latter refers to risk sharing between employers and employees, where they forgo wage demands during economic upswings in return for wage security during economic downturns. The IMF (2012) argued that in a recession, lower profits are responsible for a drop in income, and thus, labor share rises automatically. In the case of the United States, the short-term focus of firms induced managers to lay off workers in order to increase productivity (Stiglitz, 2012). Nonetheless, apart from these short-term fluctuations, the labor share has shown a long-term downward trend.

After peaking in the late 1970s and early 80s, the labor share declined noticeably in Continental European countries, while the drop was more moderate in Anglophone countries (Razgūnė and Lazutka, 2015). Between 1980 and 2007, labor's share of income decreased by nine percentage points in France and Germany, by ten in Spain, and by eight in Italy. In the same period, the US labor share declined by five percentage points, whereas Canada saw a smaller decline of two percentage points. In the UK, the adjusted wage share remained stable, only fluctuating in line with the business cycle. However, in spite of this decline, it is essential to document that the downward trend in France started to level off in the late 1980s, and in Italy, it began to become stable in the mid-1990s (Razgūnė and Lazutka, 2015).

The variance in how adjusted wage shares evolved between Continental European and Anglophone countries can partly be explained by wage dispersion. Empirical studies have consistently found that wage inequality, defined as the income gap between top earners and the rest of the population, has risen meaningfully in Anglophone countries (OECD, 2011). Piketty and Saez (2003; 2006), using income tax data, showed that top income shares in the US and UK have risen since the 1980s, and in the US, this increase was driven by increasing top salaries. If we adjust the wage share figures to exclude the influence of extremely high top incomes, it becomes evident that regular workers in English-speaking countries receive a smaller share of wages than it first appears. Razgūnė and Lazutka (2015) support this interpretation, emphasizing that rising income inequality has masked the extent of the decline in labor share. This phenomenon is not limited to the advanced economies: Research by Rodriguez and Jayadev (2010), covering 129 countries, found that it has happened worldwide.

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There is no clear consensus on the causes of the income distribution trends described above, as competing explanations exist. Nevertheless, Dünhaupt (2013) delivers a thorough summary of the main arguments in empirical assessments of the labor share. Among these arguments, Dünhaupt (2013) highlights neoliberalism and financialization. The deregulation and liberalization of labor and financial markets, the shrinking of the state sector, and the privatization of formerly state-owned firms have all been connected to the drop in labor share. This is combined with the growing influence of the financial sector. Another central explanation is skill-biased technological change, which refers to recent advancements that tend to favor capital and highly skilled workers, often replacing lower-skilled workers in the process.

Moreover, globalization has also been associated with the declining labor share, as international trade tends to benefit capital and high-skilled labor disproportionately, to the detriment of lower-skilled labor. In less competitive markets, businesses can earn extra profits, and how these are shared depends on the relative bargaining power of labor and of capital (Dünhaupt, 2013). Additionally, changes in the economy's structure can also modify the labor share. When activities with inherently lower labor shares in value-added become more prominent, the share of the value-added that goes to workers may decline. Furthermore, because the public sector does not generate profits, privatizing state-owned enterprises usually results in a lower labor share (Dünhaupt, 2013). In conclusion, the main factors identified in the literature include neoliberalism and financialization, skill-biased technological change, globalization, labor and product market policies, as well as sectoral composition and privatization.

INCOME DISTRIBUTION PATTERNS IN SOUTHERN EUROPE

In the early 2000s, Southern European countries underwent a period of accelerated development and modernization as a result of EU monetary integration (Pedaliu, 2010). Greece, Portugal, and Spain joined the European Community with smaller public sectors compared to their northern counterparts (Pedaliu, 2010). Following democratization in the mid-1970s and especially during the process of accession to the European Community in the 1980s, all three countries opted for expanding the state's economic and political functions without resistance from European institutions (Pedaliu, 2010). Their governments fostered welfare expansion, reducing social inequality and increasing GDP, thus approaching the standards of prosperity of their Western European counterparts (Pontusson and Baccaro, 2016).

Nonetheless, their growth trajectory had some flaws, such as tax evasion, a widespread black market, insufficient social assistance for the unemployed, a lack of active labor market policies for

transition and retraining, and a push for more flexible employment relations in order to align with the requirements of service-oriented economies (Pedaliu, 2010; Asensio and Ferreira, 2024). These were some of the contradictions that laid the foundations for structural vulnerabilities that would become exposed during the 2007–2008 financial crisis (Pedaliu, 2010). Additionally, membership in the common currency, as pointed out by Asensio and Ferreira (2024), tended to aggravate the negative shocks of the GFC, partially due to unsustainable financial flows and pre-crisis investment levels.

Because of their similar macroeconomic trends within the EU since the early 2000s, the economies of Portugal, Spain, Italy, and Greece were selected for the current study. These economies experienced a similar lead-up to the global financial crisis, were all subject to severe economic contractions and external interventions, namely Troika-led adjustment programs (with the exception of Italy), and underwent structurally similar recovery paths molded by the EU’s economic governance architecture. The mutual reliance on internal devaluation, fiscal consolidation, and structural funds makes them a coherent group for a joint examination of functional income distribution and growth within a unified but asymmetrically integrated monetary union (Matthijs, 2014).

This section will thus examine the evolution of Southern Europe’s functional income distribution in three phases: Pre-crisis (2000–2008), Troika-led adjustment (2010–2014), and post-Troika stabilization and recovery (2015–2025). The late 2000s Global Financial Crisis (GFC) had lasting political, economic, and social consequences for Europe, particularly in Southern Europe (Perez and Matsaganis, 2018). In the aftermath, governments pursued recovery efforts that led to profound institutional change and turning points in welfare and labor relations (Perez and Matsaganis, 2018). Greece, Italy, Portugal, and Spain faced economic turmoil that quickly became a political crisis; instability spread from Greece to Portugal in late 2010, then to Italy and Spain in 2011 (Matthijs, 2014). Lacking external devaluation or room for fiscal stimulus after joining the Euro, these countries were submitted to a harsh adjustment process in exchange for EU financial aid (Matthijs, 2014; Zamora-Kapoor and Collier, 2014). “Austerity is not a politically neutral policy. It puts the main burden of adjustment on debtors and workers, and all but leaves creditors and capital-owners off the hook”, Matthijs (2014) warns.

These austerity policies, combined with a strong monetary policy, only complicated economic recovery. Southern Europe faced the crisis with significantly elevated levels of debt. While Greece and Italy both had debt exceeding 100% of GDP, a key difference was that Italy’s debt was largely held by domestic investors, unlike Greece, Portugal, and Spain, where foreign ownership of public debt was more significant (Zamora-Kapoor and Collier, 2014). More recently, austerity policies have taken center stage, producing redistributive effects; household earnings have plummeted drastically, particularly in Greece and Portugal, while inequalities have increased in the region. By 2012, the Gini index, which measures wealth inequality, had risen meaningfully in Greece, Spain, and Italy (Perez and Matsaganis, 2018; Zamora-Kapoor and Collier, 2014). These countries, which industrialized more recently than

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Central European economies, had structural limitations in their production systems that were not fully addressed by EU-aligned institutional reforms (Gambarotto, Rangone, and Solari, 2019; Molina and Rhodes, 2007).

Financialization further worsened the situation by separating production from the real economy. Under the EMU, policy moved toward capital mobility, liberalizing markets, deregulating finance, and reducing restrictions on cross-border capital flows, which gave globalization the power to expose Southern Europe's industrial fragility (Barradas *et al.*, 2018; Perez and Matsaganis, 2018). Even though the EMU originally delivered benefits like lower interest rates, it also helped fuel unsustainable debt before 2008, creating financial instability, deindustrialization, and persistent unemployment (Epstein, 2014). Later reforms and austerity driven by the EU undermined productivity-augmenting institutions, such as wage coordination, vocational training, and even public investment (Baccaro and D'Antoni, 2022). As Clift and McDaniel (2021) explain in the UK case, ignoring institutional foundations, like labor market institutions, corporate governance, and state capacity, can be harmful to overall growth: A phenomenon they qualified as the "politics of productivity".

The Eurozone's architecture further added to these pressures. The ECB's centralized monetary policy set interest rates uniformly across diverse economies, while each government faced fiscal limits under the Stability and Growth Pact, eliminating the ability to use deficit spending to support recovery (Moury and Afonso, 2019). Moreover, the ECB and Commission financial aid came with rigid conditionality that amplified social distress (Barradas *et al.*, 2018). As Baccaro and D'Antoni (2022) observe, Southern European countries essentially "tied their hands" by accepting these constraints. This voluntary pledge diminished sovereignty, stifled recovery potential, and deepened stagnation by eroding public investment and social protection. In the words of these authors, the Eurozone's architecture enforced adjustments that sacrificed both growth and social stability.

Under EU pressure and financialization, these economies went through a profound institutional transformation. Austerity measures implemented from 2011 onward failed to stabilize economies and instead exacerbated existing problems. Blyth and Matthijs (2017) call this period a "black Swan event" that revealed systemic blind spots. The authors Chappe and Blyth (2020) described austerity further as a "magic money solution" that masks structural economic weaknesses. Simultaneously, a stronger Euro, though making imports cheaper, did severe harm to local manufacturing, especially in the labor-intensive industries (Perez and Matsaganis, 2018), triggering capital relocations that affected SMEs' (small and medium-sized enterprises) supply chains.

Poorly timed financial reforms triggered a credit crunch that "strangled" small businesses and households (Gambarotto *et al.*, 2019). Simultaneously, bank losses and failures affected household and firm financial safety (Koutsoukis and Roukanas, 2016), pushing credit-dependent SMEs toward

insolvency amid falling demand (Perez and Matsaganis, 2018). Increased labor taxation and reduced public investment further shrank activity, contributing to rising deficits (Koutsoukis and Roukanas, 2016). Notably, growth in these economies remained demand-led, relying on consumer spending and private debt (Stockhammer, 2016; Matthijs, 2016; Pontusson and Baccaro, 2016).

Pontusson and Baccaro (2016) argue that Southern Europe's demand-driven growth model left it particularly vulnerable to austerity. Cuts to public investment and education, which are foundational to equitable, skill-intensive growth (Wren, 2013; Beramendi *et al.*, 2015; Hall, 2018), stalled long-term prospects, delivering cycles of low investment, high unemployment, and rising inequality. Storm (2020) situates these challenges in secular stagnation, relating demographic decline and constrained credit to weak recovery. As austerity worsened, wage share fell, whereas the profit share rose (Perez and Matsaganis, 2018).

Internal devaluation adjustments dismantled collective bargaining arrangements, decentralized wage-setting, and institutionalized job precariousness. This allowed corporations to reduce labor costs even amid stagnant demand. Streeck (1997) posits that erosion within cooperative constraints, such as collective bargaining, has a profoundly damaging effect on social stability. Lavoie and Stockhammer (2013) and Storm and Naastepad (2013) demonstrate that such labor market strategies worsen recessions in demand-constrained nations. Notably, profit gains during recovery were not attributed to productivity improvements but to wage suppression and labor flexibility (Stockhammer, 2016; Obst *et al.*, 2016). In spite of differences in austerity severity among Greece, Portugal, Spain, and Italy, effects on income distribution were consistent across them: Procyclical austerity alongside deep economic recessions (Stockhammer, 2016; Obst *et al.*, 2016; Lavoie, 2018).

Palley (2019) suggests that relying on theories like the natural rate of interest or the zero lower bound (when rates are already too low to cut more) does not justify spending cuts when economies are weak. Thus, predictably, these cuts triggered job losses, income declines, and shrinking economic activity (Perez and Matsaganis, 2018). These shifts were far from unintentional. As Perez and Matsaganis (2018) note, austerity was driven by external institutional pressures and domestic political calculations. In Greece and Italy, governments intelligently saved “politically sensitive” public-sector jobs and pensions, moving austerity burdens onto other sectors (Matsaganis and Leventi, 2014). In all four countries, wage suppression transferred adjustment burdens from capital to the workers (Wren, 2013; Beramendi *et al.*, 2015; Hall, 2018). Austerity did not merely close smaller budget deficits; it severely redistributed functional income distribution.

Despite dwindling productivity and growing unemployment that ensued in reaction to the GFC between 2008 and 2014, post-crisis years introduced a period of certain stabilization in Southern Europe (Ocana, Sanchez, Garcia-Centeno, and Fernandez, 2025). Between 2015 and 2019, and especially after

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the COVID-19 crisis, Portugal and Spain returned to their path toward convergence with Western Europe, supported by improved labor market indicators and productivity gains. Greece, after years of deep fiscal adjustment and structural reforms, achieved a momentous 10.9% cumulative output growth from 2020 to 2023. Italy, although maintaining the highest GDP per capita among the four, showed a slower post-pandemic recovery momentum (Ocaña *et al.*, 2025).

Nevertheless, structural weaknesses continue to impact convergence. Employment rates in the Mediterranean countries stay below the EU's goal of 78%, with Portugal showing the closest alignment, just six percentage points away, whereas Italy, Greece, and Spain lag by 12 to 16 percentage points (Ocaña *et al.*, 2025). Unemployment remains consistently elevated, particularly among young people, and labor market fragility limits long-term growth prospects (Ocaña *et al.*, 2025). As productivity per hour worked diverged in the early 2000s, there has been a remarkable convergence lately.

Nonetheless, much of the progress is uneven, and employment growth has not been enough to close the gap with the EU average (Ocaña *et al.*, 2025). The public debt levels across the region surged during the crisis, with the average debt-to-GDP ratio rising from 81.3% in 2007 to about 140% by 2023. Italy and Spain have experienced the greatest shocks, both in fiscal balances and inflationary pressure, whereas Portugal emerged as an outlier with a comparatively stronger performance: Achieving superior alignment with EU fiscal indicators and curbing deficit growth while raising employment (Ocaña *et al.*, 2025).

Southern Europe's post-crisis trajectory shows a hesitant but persistent rebound. But high debt and persistent labor market inefficiencies, emphasized by increased flexibility, a decline in union density, heightened labor market deregulation, rising unemployment rates, and the proliferation of precarious employment forms, threaten such a recovery (Asensio and Ferreira, 2024). Portugal, on paper, stands as a southern version of a success story, yet it continues to exhibit sizable inflationary pressures and fiscal imbalances. This irregular recovery affects the functional income distribution, ensuring labor's share remains weak in relation to capital (Ocaña *et al.*, 2025).

CHAPTER III

MODEL AND HYPOTHESES

The model that was applied here is inspired by Alcobia and Barradas (2023), who were influenced by Barro (1991). The model incorporates variables from both the post-Keynesian and Kaleckian traditions, focusing on the role of labor share as the main explanatory variable influencing real GDP growth. Following this rationality, it contains a set of control variables that were chosen due to being theoretically and empirically recognized as important post-Keynesian growth drivers by influencing aggregate demand (Alcobia and Barradas, 2024). These variables are domestic credit to the private sector and total public expenditure (Gräbner, Heimberger, Kapeller, and Schütz, 2020; Stockhammer and Kohler, 2022; Stockhammer and Wildauer, 2016).

The main model incorporates gross fixed capital formation (*GFCF*) as a proxy for investment, reflecting Kalecki's thesis that investment is a primary driver of growth under capitalism due to its dual role in influencing current demand alongside future productive capacity. In addition, it includes collective bargaining coverage (or *CBC*) as a proxy for labor-capital distributional conflict, congruent with Kaleckian economics' emphasis on the distributional friction between capital and labor as the main determinant of macroeconomic outcomes. *CBC*, therefore, serves to capture both the influence of wage-setting institutions and power relations between social classes that affect demand and income distribution.

Additionally, the interaction term between the wage share and *GFCF* is included to capture the combined effect of income distribution and investment on output growth. At the same time, wage share reflects the distribution of income towards labor, and *GFCF* proxies investment in productive capacity. Their interaction acknowledges that investment's contribution to growth might depend on the level of the labor share, and vice versa, exemplifying the feedback loop between demand, driven by wages, and supply capacity, driven by investment, as suggested by Kalecki (Kalecki, 1971).

Hence, the baseline model takes the following form:

$$gdpi_{i,t} = \beta_0 + \beta_1 D_c_wsi_{i,t} + \beta_2 D_c_gfcfi_{i,t} + \beta_3 D_c_ws_c_gfcfi_{i,t} + \beta_4 cbci_{i,t} + ai + \varepsilon_t \quad (3.1)$$

And the extended model takes the following one:

$$gdp_{i,t} = \beta_0 + \beta_1 D_c_wsi_{i,t} + \beta_2 D_c_gfcf_{i,t} + \beta_3 D_c_ws_c_gfcf_{i,t} + \beta_4 cbc_{i,t} + \beta_5 psi_{i,t} + \beta_6 D_cri_{i,t} + ai + \varepsilon_t \quad (3.2)$$

Where:

$gdp_{i,t}$ – Real GDP growth rate.

$D_c_wsi_{i,t}$ – First-differenced, mean-centered (adjusted) wage share.

$D_c_gfcf_{i,t}$ – First-differenced, mean-centered gross fixed capital formation.

$D_c_ws_c_gfcf_{i,t}$ – Interaction between first-differenced, mean-centered wage share and first-differenced, mean-centered gross fixed capital formation.

$D_cri_{i,t}$ – First-differenced, mean-centered domestic credit to the private sector.

$psi_{i,t}$ – Public spending (or General Government Expenditure).

$cbc_{i,t}$ – Collective bargaining coverage.

ai – Unobserved, time-invariant country-specific effects (fixed effects).

ε_t – Error term capturing idiosyncratic shocks over time.

Subscripts:

i – country index.

t – time index (year, quarter, etc.).

Hein and Vogel (2008) use *GFCF* as a proxy for investment in their empirical Kaleckian model. Their results demonstrate that the variable meaningfully stimulates economic growth. Accordingly, they conclude that capital accumulation through investment is a central driver of growth, with income distribution playing an important part in creating investment demand. Pasara and Garidzirai (2020) also evaluate short- and long-run dynamics between gross fixed capital formation and economic growth and corroborate its long-term. Lastly, but meaningfully, Farzana, Samsudin, and Hasan (2024) aver that investment has a substantial positive short-term effect on GDP growth. This supports the expectation that the model's investment proxy exerts a positive effect.

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Hein (2006) demonstrates that coordinated wage bargaining is a crucial growth driver in Kaleckian theory, as it directly impacts aggregate demand and, consequently, shapes the functional income distribution. He argues that wage bargaining, often reflected in high collective bargaining coverage, aligns real wage growth with productivity and promotes a more equitable income distribution. Furthermore, Hein (2006) shows that such coordination diminishes and fixes the level of NAIRU (non-accelerating inflation rate of unemployment) such that high employment and production are possible without causing inflationary impulses (Petreski and Tanevski, 2023). For such reasons, it is expected that collective bargaining coverage exerts a positive effect on GDP.

The interaction between the wage share and *GFCF* is expected to have a net positive effect on growth, as higher wage shares increase workers' purchasing power, thereby supporting demand for goods produced through investment. Simultaneously, increased investment enhances productive capacity, enabling the economy to meet this demand. As a result, if both wage share and investment rates are high, both together reinforce GDP growth more effectively than either in isolation, emphasizing the relationship between investment and income distribution.

The expected positive effects of the wage share, domestic credit to the private sector, and public spending on growth are well established in the post-Keynesian literature (Alcobia and Barradas, 2024). Jungmann (2021) argues that wage share increases aggregate demand by boosting private consumption, which outweighs negative impacts on investment and net exports. As for credit availability, it enhances demand by incentivizing greater household consumption and corporate investment (Hein, 2012; Jungmann, 2021). Lastly, Jungmann (2021) and Stockhammer and Kohler (2022) contend that public spending generates a positive impact on GDP growth via fiscal multipliers in the context of a recession.

However, government spending harmed Portuguese GDP growth in the post-Keynesian model developed by Alcobia and Barradas (2023). Therefore, the same result is expected in the present model. They hypothesize it could be due to higher wages of public employees, higher inflation pressures, inefficient public corporations, and corruption, among other explanations that may be explored in detail in the next section, if the result holds (Alexiou, Vogiazas, and Nellis, 2018; Alcobia and Barradas, 2023). The same happened for credit to the private sector in their 2024 model; hence, a negative result is also expected here. That can happen due to quick credit growth (mostly household mortgage), making banks less robust and economies progressively more prone to shocks, reducing the financing that is available for productive ventures, and also raising debt servicing costs (Alcobia and Barradas, 2024; Correia and Barradas, 2021).

Accordingly, the estimated coefficients are expected to exhibit the following signs:

$$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 < 0, \beta_6 < 0$$

(3.3)

This means that, for the main explanatory variables — wage share, gross fixed capital formation, the interaction between wage share and *GFCF*, and collective bargaining coverage — a positive marginal effect on real GDP growth is expected. In other words, holding all other factors constant, an increase in any of these variables is hypothesized to be associated with an increase in growth. On the contrary, for the control variables, public spending and domestic credit, a negative outcome on growth is anticipated, meaning that higher levels of these variables are expected to be connected with a reduction in the economic growth rate, holding all other factors constant.

DATA AND ECONOMETRIC METHODOLOGY

Annual data were collected for Italy, Greece, Spain, and Portugal between 1993 and 2023, making up a balanced panel dataset with four cross-sectional units ($N=4$) and observed across 31 years. However, the analysis sample spans from 1994 to 2023 due to the use of first-differenced variables, which remove the initial observation for each unit ($T=30$). Variables were expressed in real terms, and data were collected from credible agencies and international databases, including Eurostat, AMECO, OECD, and the World Bank, complemented by secondary sources in instances wherein primary data were unavailable (*Table 1*).

It is important to note that the small number of cross-sectional units limits the generalizability of the inferences. The selected economies share similar economic structures and policy environments, which makes them particularly relevant for the research question at hand. However, there must still be caution when extrapolating beyond this sample. The current investigation, thus, prioritizes internal validity over external generalization.

The panel is balanced, ensuring that all countries are represented throughout all periods, thereby ruling out biases due to variations in the sample composition and improving the over-time comparability of estimates. However, the collective bargaining coverage variable had missing values originally. Alternative variables that proxied labor's negotiating power relative to capital, namely union density, individual and collective dismissals, and wage-setting coordination, also had missing values. Because of this, the originally intended variable, *CBC*, was preferred over them. Nonetheless, as the missing values

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are relatively few, imputation can improve estimates, even with gains for fixed-effects being more modest (Young and Johnson, 2015). To check robustness, alternative specifications using unbalanced panels, with missing values, were assessed and yielded consistent results, thus confirming the robustness of the findings (*Attachment A*). The initial missing collective bargaining values were: 2021–2023 for Portugal, 2019–2023 for Spain, and 2019–2023 for Greece. In addition, various robustness checks (*Attachment B*) confirmed that the outcomes are not driven by the chosen estimation method, explained below.

For Portugal, 2021–2023 values were estimated by carrying forward the average coverage from 2016–2020 (77.28%); the same applies to Spain, 2019–2023 values were calculated with the 2014–2018 average (80.56%). Lastly, for Greece, the last observed value (2019) was forward-filled from 2020 to 2023 (80.56%). Importantly, in addition to the manual imputations, missing values were also addressed using the multiple imputation (*MI*) technique; and another regression, excluding the *CBC* variable entirely, was estimated. Both approaches confirmed the robustness of the results (*Attachment B*). A relevant detail is that Italy's *CBC* values were all fixed at 100% in OECD's official data, which were kept. Despite this, a robustness check, assuming a constant 80% coverage rate instead, which is closer to the estimates from alternate sources, also confirmed the robustness of the results (*Attachment B*).

Descriptive statistics for all variables are presented in *Table 2*, while the correlation matrix is provided in *Table 3*. Correlations between variables do not exceed 0.8 in absolute value, indicating no severe multicollinearity (Studenmund, 2005). Additionally, *Figure 1* shows the evolution of wage share, the main explanatory variable, over time, across the Mediterranean countries. It shows a general downward trend from the early 90s to the late 2010s, with gradual declines and some fluctuations until about 2017, when it reaches its lowest point, near 52. After 2017, wage share suffered an abrupt rise, peaking around 2020, followed by another decline.

All estimations were conducted using a fixed effects (FE) framework, selected on the basis of a Hausman (1978) test (*Attachment C*), which strongly rejected the null hypothesis in favor of the fixed effects model over the random effects option. The fixed effects specification controls for all unobserved, time-invariant country-specific characteristics that could bias the relationships between the independent variables and real GDP growth (Wooldridge, 2010). The model was implemented in Stata 18, using the *xtreg, fe* command with standard errors clustered at the country level, which produces consistent inference under arbitrary heteroskedasticity and serial correlation within panels (Cameron and Miller, 2015).

The choice to use standard errors clustered (*Attachment D*) is supported by the outcomes of the Modified Wald test for groupwise heteroskedasticity (*xttest3*), which show serial correlation, as well as the possibility of heteroskedasticity across units (*Attachment D*). Moreover, the variance inflation factor (*VIF*) diagnostics confirmed the absence of severe multicollinearity among regressors (*Attachment E*).

The Im, Pearsan, and Shin (2003) panel unit root test was applied to variables in levels and first differences. It indicated a mixture of I (0) and I (1) processes, justifying the transformation of some variables into first differences to avoid spurious regression problems (*Table 4*). The collective bargaining agreement variable has constant values for Italy (it is fixed at 100% for all years), as per OECD estimations, and thus returned inconclusive test results for that cross-section.

Differencing non-stationary variables helps eliminate time-invariant heterogeneity and reduces the risk of spurious regression caused by trends or unit roots in the data. More importantly, the research question emphasizes short-run tendencies. This focus aligns with policy interests centered on immediate effects and adjustments instead of long-run equilibrium relationships. By concentrating on differenced data, the model captures these short-run elasticities more clearly.

Variables, except GDP and PS, are also mean-centered, meaning they are expressed as deviations from their average annual change over the sample period. This transformation improves interpretability and reduces multicollinearity among regressors. Furthermore, mean-centering after differencing helps to steady variance and moderate autocorrelation, improving robustness. Accordingly, coefficients in this specification represent the expected change in the annual change of GDP growth, considering a one-unit deviation in the yearly change of an independent variable from its mean change.

Table 1. The proxies, units, and sources for the variables.

Acronym	Variable	Proxy and Unit	Source
<i>GDP</i>	Economic Growth	GDP Growth (Annual %)	World Bank
<i>WS</i>	Wage Share	Adjusted Labor Share (% of GDP at Current Market Prices)	AMECO
<i>GFCF</i>	Investment	Gross Fixed Capital Formation (% of GDP)	OECD
<i>CBC</i>	Collective Bargaining Coverage	Institutional Characteristics of Trade Unions, Wage Setting, State Intervention, and Social Pacts (Total %)	OECD

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<i>CR</i>	Credit	Domestic Credit to Private Sector (% of GDP)	World Bank ¹
<i>PS</i>	Public Spending	General Government Expenditure (% of GDP)	Eurostat ²

Table 2. The descriptive statistics.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.	Skew.	Kurt.
<i>GDP</i>	124	1.31	3.535	-10.94	8.931	-1.192	5.194
<i>WS</i>	120	-.181	1.166	-3.9	3.8	.627	5.383
<i>GFCF</i>	120	-.073	1.247	-4.694	2.924	-.876	4.746
<i>WS*GFCF</i>	120	.266	6.611	-35.628	23.629	-.485	10.852
<i>CBC</i>	120	.407	7.754	-25.074	23.59	.174	3.937
<i>CR</i>	124	47.126	4.922	36.925	63.859	.42	3.483
<i>PS</i>	124	83.281	22.778	14.2	100	-2.019	6.544

Table 3. The correlation matrix.

Variable	<i>GDP</i>	<i>WS</i>	<i>GFCF</i>	<i>WS*GFCF</i>	<i>CR</i>	<i>PS</i>	<i>CBC</i>
<i>GDP</i>	1.0000						
<i>WS</i>	-0.4609***	1.0000					
<i>GFCF</i>	0.5153***	-0.1710*	1.0000				

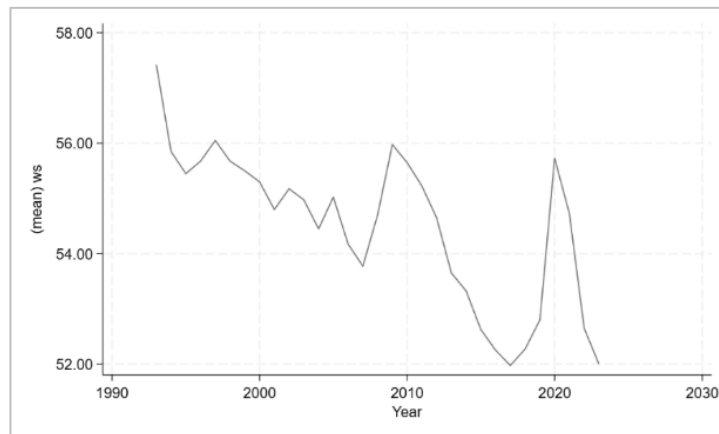
¹ For years prior to 2000, data were obtained from EconStats, a secondary aggregator that attributes its figures to the IMF Government Finance Statistics and OECD GDP estimates.

² Data for years before 1995 were sourced from the IMF Government Finance Statistics database, as they were unavailable in Eurostat.

<i>WS*GFCF</i>	0.2344***	-0.1943**	-0.1048	1.0000			
<i>CR</i>	-0.1990**	0.3115***	-0.0535	-0.0979	1.0000		
<i>PS</i>	-0.4462***	-0.0247	-0.1744*	0.0233	-0.2240**	1.0000	
<i>CBC</i>	0.0314	0.1498	-0.0794	-0.1435	0.3140***	-0.1938**	1.0000

Legend: * p<0.10, ** p<0.05, *** p<0.01.

Figure 1. Wage share over the years.



Description: The Stata-generated graph represents the wage share (% of GDP) evolution in Southern Europe from 1993 to 2023. The sharp increases in 2010 and 2020 reflect GDP contractions during the post-financial crisis and the COVID-19 pandemic, respectively, rather than a rise in total wage compensation. Since the wage share is measured as a percentage of GDP, these spikes are driven primarily by declines in the denominator.

Table 4. Panel unit root tests.

Variable	Test	Test Statistic	P-value	Conclusion

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<i>GDP</i>	IPS	Z-t-tilde-bar = -5.0135	0.0000	Stationary
<i>D_c_WS</i>	IPS	Z-t-tilde-bar = -5.1825	0.0000	Stationary
<i>D_c_GFCF</i>	IPS	Z-t-tilde-bar = -3.0152	0.0013	Stationary
<i>D_c_WS_c_GFCF</i>	IPS	Z-t-tilde-bar = -4.3786	0.0000	Stationary
<i>D_CR</i>	IPS	Z-t-tilde-bar = -2.9371	0.0017	Stationary
<i>PS</i>	IPS	Z-t-tilde-bar = -1.8141	0.0348	Stationary
<i>CBC</i>	IPS	Not available	-	Inconclusive

Some alternative specifications were explored, such as additional lags of explanatory variables (up to four years). The best lag length was determined using the Akaike and Schwarz information criteria (*Attachment F*). Dynamic panel models such as Arellano-Bond (1991) and system GMM (Blundell and Bond, 1998) were also considered. Nonetheless, due to the small cross-sectional dimension of the dataset ($N=4$), these models were not viable. With few groups, the number of available instruments is limited, reducing the reliability of Sargan/Hansen and Arellano-Bond autocorrelation tests. In addition, Roodman (2009) cautions against using GMM in small samples. Overall, the fixed-effects specification was preferred due to its parsimony, robustness, and appropriateness for the proposed study.

CHAPTER IV

FINDINGS AND DISCUSSION

Estimation outputs of the model appear in *Figure 2*. R-squared Statistics suggest that it explains a major proportion of the variation in growth. Specifically, the within R^2 of 0.682 shows that the model accounts for approximately 68% of the variation in growth within countries over time, which is fairly strong. The between R^2 of 0.577 suggests that around 58% of the cross-country variation in average GDP growth is explained, while the overall R^2 of 0.620 indicates that about 62% of the total variation in output growth is captured. Lastly, since the ρ coefficient is 0.238, about 24% of the variance in GDP growth can be due to unseen effects unique to economies in particular, consistent with the choice of a *fe* model. Overall, these results suggest that the model exhibits large explanatory power longitudinally within countries and comparatively across a range of nations while accounting for unique features inherent within each country.

Figure 2. Main regression table.

. xtreg gdp D_c_ws D_c_gfcf D_c_ws_c_gfcf D_cr ps cbc, fe vce(cluster id)						
Fixed-effects (within) regression			Number of obs	=	120	
Group variable: id			Number of groups	=	4	
R-squared:			Obs per group:			
Within = 0.6818			min =		30	
Between = 0.5770			avg =		30.0	
Overall = 0.6195			max =		30	
corr(u_i, Xb) = -0.3909			F(3, 3)	=	.	
			Prob > F	=	.	
(Std. err. adjusted for 4 clusters in id)						
gdp	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
D_c_ws	-1.032197	.2807008	-3.68	0.035	-1.925512	-.1388816
D_c_gfcf	1.166006	.2529459	4.61	0.019	.3610195	1.970993
D_c_ws_c_gfcf	.1041144	.032264	3.23	0.048	.0014359	.2067928
D_cr	-.1124219	.0249377	-4.51	0.020	-.1917848	-.033059
ps	-.3940868	.0551328	-7.15	0.006	-.5695441	-.2186295
cbc	.0313885	.0080874	3.88	0.030	.0056509	.0571261
_cons	17.282	3.237648	5.34	0.013	6.97836	27.58564
sigma_u	1.1550011					
sigma_e	2.0702345					
rho	.2373753	(fraction of variance due to u_i)				

Description: The figure presents the main regression table of the current analysis.

Nonetheless, results should be interpreted with caution given the small sample size ($N=4$), potential endogeneity (although fixed effects help address it), and the short-run focus of differenced variables. Moreover, some data were imputed, which is extensively detailed in the *Methodology*. Notwithstanding these limitations, the fixed-effects framework, robustness checks, and relatively strong explanatory power support the credibility and relevance of the inferences.

At conventional significance levels, all variables are statistically significant and show the expected signs, except, interestingly, the main explanatory variable, wage share. Wage share unexpectedly exerts a negative effect on Southern European countries' economic growth in the short-run. It directly contradicts previous literature, namely the aforementioned research from Alcobia and Barradas (2023; 2024). This section serves the purpose of using theory to better understand the results and meanings of each variable in relation to Southern Europe's growth trajectory.

WAGE SHARE (AND INTERACTION)

Since the model's data is first-differenced and mean-centered, as previously stated, all coefficients represent the effect of a one-unit deviation from the mean annual change in the Southern European economy's GDP growth. That applies to all variables, except the ones where it is explicitly noted not to be the case. Keeping that in mind, looking at the wage share variable, it shows a p-value of 0.035, meaning that it is statistically significant at the 5% level. Concluding from the coefficient (*Figure 2*), a one-unit increase in the annual change of wage share, relative to its average change, is linked with a 1.03 percentage point decrease in GDP growth in the short-run. Crucially, this suggests that higher increases in the wage share correlate with lower GDP growth in the short-term. These results appear contradictory, but they say something else in conjunction with the investment variable:

Table 5. Marginal effects table (Short-term, differenced, mean-centered).

Investment (<i>GFCF</i>)	Marginal effect of wage share on GDP growth	Wage Share	Marginal effect of <i>GFCF</i> on GDP growth

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-1 (Low)	$-1.03 + 0.104 \times (-1) = -1.134$	-1 (Low)	$1.17 + 0.104 \times (-1) = 1.066$
0 (Average)	$-1.03 + 0.104 \times 0 = -1.03$	0 (Average)	$1.17 + 0.104 \times 0 = 1.17$
1 (High)	$-1.03 + 0.104 \times 1 = -0.926$	1 (High)	$1.17 + 0.104 \times 1 = 1.274$

Although the short-run regression results indicate that the wage share alone has a negative impact on economic growth, the positive and significant interaction between the wage share and investment shows that the effect of one variable depends on the level of the other (*Figure 2*). As illustrated, for simplicity's sake, in *Table 5*, the marginal effect of wage share on output growth goes from -1.134 when investment is one unit below its mean, to -1.03 at the mean, and then to -0.926 when investment is one unit above it. Conversely, the marginal effect of investment on output growth ranges from 1.066 when the wage share is one unit below its mean, to 1.17 at the mean, and then to 1.274 when the wage share is one unit above it. In *Table 5*, each number signifies the estimated effect of one variable on growth at different levels of the other one. It was calculated using the formula: *Main effect + interaction coefficient $\times$ level of the other variable*. To make sure the results are intuitive, -1 (low), 0 (the average), and 1 (high) were chosen to represent, respectively, one unit below the average, the actual average, and one unit above the average of the mean-centered, differenced data.

In total, these results show that higher investment alleviates the negative short-run impact of wage share, while a higher wage share strengthens the positive effect of investment. This pattern aligns with Kaleckian theory, which emphasizes that aggregate demand is regulated by domestic consumption and investment (Kalecki, 2013). In light of this assumption, wage-led growth is realized when the wage share is paired with sufficient investment, and investment has a stronger growth effect when the wage share is relatively high. The results of the wage share alone differ meaningfully from those reached by Alcobia and Barradas (2024), which could be due to differences in the time horizon between models, rather than a substantive contradiction. In the short term, the growth effects of wage share may be limited by institutional constraints or lagged responses in consumption and investment. Over time, however, the cumulative effects of higher wage-led demand may become more visible, explaining their more favorable results.

By using first-differenced, mean-centered variables, this analysis focuses on the immediate effects of shocks in wage share and investment on economic growth. With this model, wage share alone appears to have a negative short-run effect (as noted above), as temporary increases in wages can reduce firms' retained earnings and stifle output, while investment alone exerts a positive effect, a result to be

explored next (Kalecki, 2013). The noteworthy positive interaction between wage share and investment, however, indicates that the effect of one variable depends on the other, consistent with Kaleckian theory: Higher investment mitigates the short-term drag from rising wages, while higher salaries intensify the positive effect of investment. It works as a feedback loop. When wages rise, firms' profits may be squeezed, temporarily reducing production; if investment is also high, however, it might create income for workers and increase profit for firms, partially compensating for the negative effect of higher wages on short-term profitability. It propels demand, in spite of higher wage costs.

Aside from investment cushioning the drag of rising wages, results also show that rising wages can strengthen the impacts of investment on aggregate demand (*Table 5*). According to Kalecki (2013), investment drives growth, thus generating income for workers and firms. If wage share is already high, more of the additional income goes to workers, who have a higher marginal propensity to consume than capitalists (Kalecki, 1971). As a result, investment's impact on the economy is amplified, boosting aggregate demand and leading to economic growth. In short, the logic is that a higher-wage economy enhances the already positive effects of investment due to workers' higher propensity to consume. At the same time, the nature of investment also matters, since certain types of investment can generate productivity gains that are less visible in the short-term but become more significant over time. In contrast, prior studies focus on long-term equilibrium relationships, where the short-term shocks are treated primarily as transitory adjustments, like Alcobia and Barradas (2024) do.

Consequently, wage share tends to correlate positively with growth in the long-term once these transitory impacts "wash out". These differences suggest that short- and long-term dynamics are complementary: Short-term results reveal how growth responds to immediate fluctuations, whereas the long-term evidence reveals the eventual equilibrium outcomes. But what can the empirical data say about the results? OECD investment (*GFCF* as % of GDP) data shows:

Table 6. Investment trends in Southern Europe (% of GDP).

1993–2002	2003–2012	2013–2023
23.13%	22.16%	17.01%

The empirical decline in investment in Southern Europe, shown in *Table 6*, may be interpreted as the combined effect of high public debt, austerity policies, and labor market liberalization following the GFC, which constrained both public and private investment (Matthijs, 2014; Perez and Matsaganis, 2018; Baccaro and D'Antoni, 2022). Internal devaluation, suppressed wages, and diminished collective

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bargaining diminished labor expenses but equally repressed domestic consumption, therefore constraining firms' motive to raise productive capacity (Streeck, 1997; Lavoie, 2018). At the same time, financialization and the liberalization of capital flows allowed profit to be increasingly realized through financial channels instead of productive investment; meanwhile, the Eurozone's institutional architecture restricted national fiscal and monetary autonomy, further hindering domestic capital formation (Barradas *et al.*, 2018; Moury and Afonso, 2019).

Seen in a Kaleckian lens, this observed serious decline in investment, from 23.13% to 17.01%, could potentially undermine a positive interaction effect between investment and wages. That is, if firms are experiencing structurally lower investment levels, temporary rises in wages will be less likely to be compensated by demand created via the investment channel. The negative short-run consequences from wage raises apparent in the model can suggest an economic environment where the accelerator role of investment has diminished, such that the capacity of rising wages to create demand via Kaleckian feedback loops becomes restricted. However, this pattern does not seem to be apparent in long-term studies where growth-wage share linkages are positive and contrary to those in the short-run. A plausible reason is that, over time, the transitory profit-squeeze shocks “wash out”, whereas the higher marginal propensity to consume of workers sustains aggregate demand levels and eventually induces investment.

Another plausible explanation is that the long-run allows firms to adjust by investing in ways that raise productivity. For example, innovative technologies or processes can reduce unit labor costs (Kalecki, 2013), so that higher wages no longer translate directly into lower profits. In this way, investment gradually shifts toward productivity-enhancing forms, which raise profitability and make higher wages more compatible with growth. Likewise, firms and institutions may adapt to changes in the wage share so that the initial contractionary impact is mitigated (Kalecki, 2013). In less technical terms, these results demonstrate how a failure to invest exacerbates the contractionary impact of high wages; however, long-run evidence suggests a wage-led arrangement where persistent domestic consumption supports demand while productivity-enhancing investment and institutional adaptation create a “secure” environment for sustained growth (Alcobia and Barradas, 2024).

INVESTMENT (AND INTERACTION)

The investment proxy variable, or *GFCF*, shows a p-value of 0.018, meaning that it is statistically significant. The variable's coefficient (*Figure 2*) demonstrates that a one-unit increase in the annual change in investment growth, relative to its average change, is correlated with a 1.167 percentage point

increase in GDP growth in the short-run. In short, this suggests that investment plays a strongly positive part in driving short-run growth, as expected.

This result can be explained with Kaleckian theory, which stresses that investment is the primary engine of growth in capitalism, because it creates both demand and profits (Kalecki, 1971). When capitalists increase investment, they are not merely expanding the future productive capacity but also raising current demand for goods, services, and labor, unlike household consumption. Households can be constrained by income and savings; investment, however, adds to the total demand without an immediate counterweight (Kalecki, 2013). In easier terms, when a household buys products or services, income and savings are used, meaning that the spending is limited by what the household already has. So, if everyone decides to save more or loses income, total spending can drop. It can fluctuate and may not constantly push the economy upward. Still, when firms invest, by building infrastructure or buying machinery, they generate demand directly. It pays workers, buys materials, and hires services. It is not just moving money around; it directly injects demand into the economy.

To summarize, household spending often replaces other spending. For example, if one buys a car, then one might spend less on clothes. Investment, however, is mostly a new activity, generating income for other economic agents, circulating further. Tying this back with the investment results, what this means is that an investment has a strong and positive effect on growth because it boosts profits, raises capacity utilization, and triggers more economic activity, like Kalecki emphasizes. This diverges from the Keynesian multiplier theory, which focuses more on how any increase in autonomous spending, whether it is investment, government expenditure, or exports, sets off a chain reaction through the multiplier effect. From that view, investment is relevant because it initiates the process, but the emphasis is on how the successive sequences of spending multiply throughout the whole economy. Kalecki, inversely, places more weight on investment itself, because it not only sets off demand, but it also regulates profits, making it the main growth driver instead of solely one component of autonomous demand, meaning demand that does not depend on the economy's current productive output (Kalecki, 1971).

The model captures short-run effects, so it is relevant to distinguish between how Kaleckian and Keynesian theory each describe why investment is important in this time horizon. For Kalecki, investment fuels production and employment, making the effect on economic growth immediate: Higher investment leads to higher profits, and they lead to a higher output. The emphasis is on the profit-driven distributional device. Still, Keynes centers his rationalization around the aforementioned multiplier effect. Money spent by the firms becomes income for the workers, who in turn spend a portion of it and stimulate further demand. Importantly, however, this process is not merely circular; it depends on firms' expectations being realized and on the anticipated prospective yield of investment, with profits playing a decisive role in sustaining the expansion. The short-term effect is thus the

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cumulative result of these consecutive sequences of spending, which emphasizes a demand-driven circular flow, not profits (Dünhaupt, 2013). For simplicity purposes, the following illustration recapitulates the mechanisms, or economic devices, described above:

Table 7. Kalecki's profit loop vs. Keynes's multiplier effect.

Feature	Kaleckian Theory	Keynesian Theory
Mechanism	Investment → profits → more production and employment.	Investment → income → multiplier rounds → more production and employment.
Emphasis	Profit distribution and class interactions.	Aggregate demand and spending circulation.
Short-term effect	Immediate growth in profits and output.	Gradual expansion of production through successive spending series.
How it fundamentally works	Capitalists' profits depend on investment; more investment = more profits = more output.	New spending injects money into the economy; each round of spending creates further income and demand.
Consumption's task	Consumption is largely dependent on profits; investment drives growth.	Consumption responds to income; the multiplier effect magnifies initial spending.
Summary	Growth is investment-driven.	Growth is demand-driven.

According to empirical data included in the literature, Southern European's economic trajectory post-2000s is coherent with the model's results. During the pre-crisis period, public and private investment, supported by technological modernization and consequent convergence with Western Europe, contributed heavily to GDP growth and welfare expansion (Pedaliu, 2010; Pontusson and Baccaro, 2016). However, the GFC and the subsequent austerity policies served to reduce levels of investment, hence dismantling this growth catalyst and widening income inequality (Perez and Matsaganis, 2018; Stockhammer, 2016). The lead regression table (*Figure 2*) suggests that investment decline might have acted directly to constrain growth via a decline in demand and profit, consistent with Kaleckian economics. In contrast, periods of post-crisis stabilization and recovery, particularly in Portugal and Spain, have coincided with renewed investment activity, which has been instrumental for reviving growth and improving labor market outcomes notwithstanding stubborn structural restrictions (Ocaña *et al.*, 2025).

In conclusion, empirical evidence suggests that investment's short-run effect matches Southern Europe's historical development. Investment variations, positive and negative, have brought about immediate and remarkable effects on production, wages, and subsequently, functional income distribution. Kalecki's emphasis on the importance of investment-driven profits helps make sense of why the Southern European economies faltered under austerity and why their recovery has continued to be fragile in the absence of persistent, high-level investment. This proposition aligns with the Kaleckian short-term mechanism: Less investment immediately means lower demand and lower output. On the contrary, the post-crisis rebound in investment encouraged immediate growth, again reflecting short-term tendencies.

The data, from OECD and the World Bank, does imply that this is the case. After all, in Southern Europe, the average investment from 2011 to 2016 was 16%, and the average growth rate during the same period was -0.87%; from 2017–2023, inversely, average investment experienced a rebound, increasing to an average of 17.90%, alongside an average growth rate of 1.77% across the four countries during the same period. These figures are merely for simplicity's sake and to confirm a hypothesis. They do not, however, account for other critical factors, such as household consumption, government spending, exports, EU monetary policy, EU structural support, and lingering austerity effects, that also influence growth. Nonetheless, these patterns present a plausible short-run illustration: Lowering investment during the crisis most likely suppressed demand and output, but the post-crisis rebound helped recover positive growth rates.

Therefore, investment emerges as a key short-run driver of GDP growth, with its effect not only positive on its own but also strengthened in the interaction with the wage share. While the main impact of investment captures its instant demand- and profit-creating effect, the wage interaction underlines how its effectiveness is improved in a higher-wage economy, where the workers' higher propensity to consume helps circulate income more smoothly (Kalecki, 1971; 2013). It can be inferred that even temporary increases in investment translate into instantaneous output gains, particularly when the wage share is high, supporting Kalecki's view of investment as capitalism's engine of growth, instead of just a component of autonomous demand.

The marginal effects presented in *Table 5* reinforce the historical patterns observed in Southern Europe. Investment's short-run effects on growth rise from 1.066 when wage share is low to 1.274 when wage share is high, while wage share alone has a slightly negative effect, going from -1.134 (low) to -0.926 (high). These results coincide with the period between 2011–2016, which was marked by austerity policies involving public sector wage cuts and other fiscal restrictions. These measures, combined with low investment, have likely contributed to sluggish growth. While wage levels may have fallen during this period, the wage share as a percentage of GDP might not have declined significantly, as the recession itself led to a contraction in GDP. On the other hand, the rebound in investment between 2017–2023 (*Table 6*) was accompanied by GDP growth and thus aligns with Kaleckian theory: Higher

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investment stimulates demand and profitability, and this effect is amplified when the wage share is high, since worker consumption supports a smooth circulation of earnings throughout the economy. Therefore, investment is the main driver of short-term growth in these economies.

COLLECTIVE BARGAINING COVERAGE

The collective bargaining coverage variable, *CBC*, exhibits a p-value of 0.030, meaning that it is statistically significant. The variable's coefficient (*Figure 2*) demonstrates that a one-unit increase in collective bargaining coverage is associated with a 0.03 percentage point increase in GDP growth. Cautiously, because the imputations (despite robustness checks) limit the confidence with which these results must be interpreted, it can be inferred that broader collective bargaining coverage supports growth, potentially through wage coordination or demand stability.

Although *CBC* changes slowly over time, its inclusion in the baseline model continues to be important in the context of a short-term study, because it outlines the economy's response to immediate shocks in investment and wages, the main explanatory variables. High coverage can stabilize consumption patterns, soften the short-run effects of shocks, and strengthen the positive impact of investment on GDP. In this way, *CBC* serves as a structural factor that affects short-term tendencies instead of as a direct shock itself.

Collective bargaining coverage acts as a structural determinant of short-term GDP from a Kaleckian standpoint since it models the distribution and solidity of wages. In countries with stronger coverage, wage-setting is coordinated among sectors, which reduces volatility in labor costs and solidifies household incomes (Kalecki, 1971; 2013). Kalecki proclaims that stable wages support aggregate demand because workers with predictable income can sustain their consumption more certainly, which keeps profits and encourages firms to invest. In this manner, *CBC* indirectly adds to the short-run effects of investment on output. Overall, stabilizing wages ensures that investment-driven income flows, boosting the feedback loop (*Table 7*) between profits, demand, and production.

Furthermore, *CBC* can capably moderate the temporary negative effects of rising wages on economic growth by preventing abrupt wage shocks that would otherwise reduce the firms' retained earnings and stifle output. Kaleckian economics emphasizes that investment is the growth engine precisely because it creates both profits and demand. In economies with a large collective bargaining coverage, investment's positive effect on GDP is strengthened, and the strain from wages is softened, which allows short-term shocks in investment and wages to translate more smoothly into output.

Fundamentally, *CBC* acts as a stabilizing structure that channels Kaleckian mechanisms more efficiently, sustaining the short-run co-movement of wages, investment, and growth in the Southern European economies.

In Southern Europe, before the crisis, welfare expansion and accelerated growth were sustained by a demand-led model that, as Pontusson and Baccaro (2016) assert, relied heavily on household consumption. This growth path, however, was structurally vulnerable to destabilization due to the uneven power of bargaining institutions across the region. The Troika-led adjustment period, from 2010 to 2014, proved this fragility. Austerity-driven decentralization of wage-setting and erosion of collective bargaining mechanisms dismantled the institutional stabilizers that, as data suggests, mitigate wage shocks and maintain aggregate demand. In Kaleckian terms, the weakening of *CBC* reduced the ability of wages to work as a stable anchor for aggregate demand, thus enhancing the immediate contractionary impact of the internal devaluation strategies and transmitting shocks directly into consumption and investment (Ocaña *et al.*, 2025). This short-term destabilization helps explain why Southern Europe faced deeper recessions and more prolonged stagnation relative to Northern member states, as wage suppression undermined both distributional stability and productive investment (Ocaña *et al.*, 2025).

The post-crisis recovery phase delivers even more empirical evidence for the coherence of the model's results. Portugal and Spain, where the bargaining structures retained greater institutional coherence despite Troika conditionalities, had stronger employment gains and a more consistent alignment with EU fiscal indicators (Ocaña *et al.*, 2025). These outcomes line up with the finding that *CBC* expands the instantaneous growth effects of investment by supporting household consumption and moderating the volatility of short-run shocks. Distinctly, Greece, where collective bargaining institutions were more meaningfully dismantled under austerity-driven reforms (Perez and Matsaganis, 2018; Baccaro and D'Antoni, 2022), still exhibits a feebler labor market, slower post-pandemic recovery, and fragile convergence trajectories (Ocaña *et al.*, 2025).

This disparity successfully puts in evidence the short-term position of *CBC* as a structural mechanism: By softening wage fluctuations and maintaining demand levels, higher coverage delineates how investment shocks are translated into output. In Kalecki's terminology, stronger bargaining coverage facilitates the circulation of investment-driven income into consumption, reinforcing the immediate investment-demand feedback loop (Kalecki, 2013). Therefore, the Southern European trajectory substantiates the notion that *CBC* may exert a notable influence on GDP growth, not as a long-run driver, but as a determinant of short-term economic stability within the asymmetrical restrictions of the Eurozone's governance architecture (Baccaro and D'Antoni, 2022). Nonetheless, these are relevant indicators, but that relevance cannot be overstated because of the non-stationarity of the *CBC* variable, as well as its imputed values (even with the robustness checks).

TOTAL PUBLIC EXPENDITURE AND DOMESTIC CREDIT

The two independent variables that will be looked into now are the control variables, whose values were estimated to harm GDP growth. Their scrutiny will be more concise, as they are not, by design, the key explanatory variables. Although public spending is first-differenced but not mean-centered, and domestic credit to the private sector is neither differenced nor mean-centered, their purpose as control variables continues to be central for identifying short-term economic growth determinants. First-differencing the public spending variable already captures its impact through changes instead of levels. This makes sense with the model's short-term focus. As for domestic credit, such a setting allows the model to capture the direct association of its contemporaneous levels with growth instead of framing the oscillations as short-term shocks. The purpose here is not to isolate structural distributional mechanisms, but to ensure that the fiscal, financial, and institutional environment is considered.

To summarize, public expenditure measures the outcome of fiscal impulses on demand, whereas credit, much like *CBC*, depicts underlying conditions that ensure output growth. Both are relevant in short-term research, even if their coefficients are not to be interpreted with the same emphasis as the key explanatory variables. The purpose of these variables is to improve the accuracy of the main estimates. With this in mind, the outputs for public spending and domestic credit can be seen as complementary to the variables examined above.

Taking a look at the output in *Figure 2*, the coefficient for domestic credit shows that a one-unit increase in the change in domestic credit is associated with a 0.112 percentage point decrease in GDP growth. Since the variable is first differences, it means that it is not the level of credit itself, but instead an acceleration in credit expansion that is negatively correlated with growth. From a Kaleckian standpoint, this may be reflecting that faster credit growth often emerges in downturns (countercyclical supply of credit) or signals fragility when economic growth is already weak. So, the results suggest that, in the short-run, increasing private credit growth is associated with reduced growth, potentially due to instability or indebtedness.

A one-unit increase in public spending is correlated with a 0.394 percentage point decrease in growth. Because the variable is in levels, these results reflect the contemporaneous association between the scale of total government spending and output growth. The negative sign may look counterintuitive, especially from a Keynesian perspective, but higher public expenditure in Southern Europe often coincides with crisis periods, when growth was lower, even negative. In other words, it is possible that this coefficient is capturing the endogeneity of fiscal policy: Total spending rises during downturns, which

mechanically correlates with weak output. That means that the statistics do not necessarily prove public spending causes lower growth, like neoclassical economists could argue; instead, it may simply mean that in the short-run dynamics of this econometric model, it is negatively associated with growth because of crisis-period fiscal responses. Without getting too much into it, as it is not one of the primary explanatory variables, it could help to look at the data and try to understand if this hypothesis holds true by assessing its premise:

Table 8. Public spending across Southern Europe (% of GDP).

Crisis period (2010–2014)	Post-crisis // before Covid-19 (2015–2019)
≈ 50.85%	≈ 46.47%

This empirical evidence reinforces the interpretation that the negative coefficient primarily reflects endogeneity bias: Government spending levels were higher during the 2010–2014 crisis (≈ 50.85% of GDP) than in the 2015–2019 recovery (≈ 46.47%), suggesting that the short-term negative association occurs from the countercyclical subtleties of fiscal policy, instead of an actual contractionary influence of public expenditure. Nevertheless, it is critical to keep in mind that this in no way invalidates the need for a thorough future investigation.

The short-term negative coefficients on domestic credit and public expenditure are best understood relative to the other tested variables and the literature. Both of them are helpful in comprehending crisis fluctuations. For example, accelerations in credit often happen during downturns, when both households and firms borrow to cover income shortfalls or service debt, while government spending rises as a response to the recession by means like automatic stabilizers, discretionary bailouts, and different crisis measures (Stockhammer, 2013). As such, the observed negative association with growth does not imply that credit or government expenditure reduces *per se*, but it can instead signify that they coincided with periods of low growth and weak profitability (Alcobia and Barradas, 2024; Stockhammer, 2016).

When considered alongside the wage share, these patterns emphasize the short-run fragility of the growth regime. A rising wage share alone was connected with a negative impact on growth, indicating a temporary squeeze in firms’ retained earnings when investment was at low levels. Empirically, during the post-GFC period, wage boosts were frequently not accompanied by sufficient investment to channel further income into productive demand. Domestic credit growth and public spending during

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the same period often functioned as reactive mechanisms. That is, credit expanded to cover household or firm liquidity gaps, and public expenditure rose in crisis conditions (*Table 8*).

Moreover, between 2003 and 2012, average investment fell abruptly, from 22.16% to 17.01% of GDP, reflecting high public debt (*Table 6*), austerity, and labor market liberalization (Stockhammer, 2016). During the same period, domestic credit accelerated, and public spending rose to respond to the instability (Alcobia and Barradas, 2024; Ocaña *et al.*, 2025). Falling investment and rising credit, combined with higher spending, may be the reason credit and fiscal expansions were negatively connected with short-run GDP growth. Without enough productive investment, these expansions can be seen as a form of crisis management, instead of demand-creating measures. From 2017 to 2023, investment rebounded to 17.90% of GDP, matching the growth (average 1.77%) observed in the same period; meanwhile, credit and public spending became constant and no longer signaled severe economic stress. These trends further corroborate the idea that short-term growth in Southern Europe was driven primarily by investment, with credit and fiscal policy playing as secondary factors, or instead, reactive mechanisms.

The task of collective bargaining coverage further clarifies this idea. High *CBC* steadied wage tendencies and household incomes, permitting the positive impacts of investment to flow more efficiently throughout the market. In economies with weaker *CBC*, like Greece, credit accelerations and fiscal expansions coincided with ongoing stagnations, likely because the unstable wages and weak investment prevented the intensification of demand. In the other economies, on the other hand, *CBC* continued at a stronger level, and therefore the rebound in investment translated more directly into growth (Ocaña *et al.*, 2025), whereas credit and fiscal spending were mostly supportive.

In sum, the evidence points to a sort of hierarchy in short-term growth drivers. Investment is the engine of growth in the Southern European countries, with its effect strengthened by a higher wage share and supported by *CBC*. Domestic credit and public spending, by contrast, echo cyclical or crisis dynamics, appearing to have a negative relationship with growth, as they coincide with downturns and profit-squeeze periods. The empirical trends in investment, credit, and expenditure reinforce the narrative that GDP growth in Southern Europe is contingent on the productive capacity of investment and institutional mechanisms that support income distribution and aggregate demand circulation, which is consistent with the Kaleckian perspective.

Overall, the evidence suggests that in Southern Europe, the wage share contributes to economic growth primarily by reinforcing investment as the focal short-run driver of output. The interaction between higher wages, investment, and *CBC* appears to maintain aggregate demand and stabilize income distribution, echoing the Kaleckian mechanism in which investment generates both profits and demand, and wage upsurges magnify the circulation of income through higher consumption (*Table 7*). The negative associations of credit and public spending in the short-run are better interpreted as coinciding with

cyclical slumps (*Table 8*), instead of being perceived as intrinsic restraints on growth. These outcomes complement Alcobia and Barradas (2024), who show, from a long-term and EU-wide perspective, that the permanent decline of the wage share has conditioned growth trajectories. Their breakdown emphasizes structural, multi-decade shocks of wage repression; the current dissertation concentrates instead on short-run tendencies at the regional level, demonstrating how wage share can positively encourage investment-led growth and emphasize demand-driven outcomes in Southern Europe.

POLICY IMPLICATIONS AND FUTURE RESEARCH PROPOSALS

Whereas the immediate aim of this research is not to put forward proposals about public policy recommendations, the short-term tendencies observed in Southern European economies yield valuable lessons for future research about growth policy. The empirical evidence shows investment as the main catalyst behind short-term output growth, adhering to Kalecki's profit-demand feedback loop (*Table 7*) mechanism (Kalecki, 1971; 2013); the observed effects become exacerbated in higher-waged economies and get bolstered by widespread collective bargaining coverage pushing investment-driven incomes through consumption (Kalecki, 1971; Alcobia and Barradas, 2024; Ocaña *et al.*, 2025). In contrast, both domestic credit and government expenditure appear negatively correlated with GDP, potentially because these variables have a reactive nature that more so reflects intrinsic contractionary effects (*Table 8*; Ocaña *et al.*, 2025; Alcobia and Barradas, 2024; Stockhammer, 2016).

The 2003–2012 trends corroborate this idea: Whereas investment dropped from 22.2% to 17% of GDP, credit picked up, and public spending rose in reaction to weaknesses, whereby a temporary contractionary relationship was observed. Between 2017–2023, as *GFCF* surged back to 18% of GDP and credit and expenditure firmed up, output growth bounced back, according to the OECD data, corroborating even further that productive investment, and not fiscal or credit expansions (in isolation), stimulates short-run growth. This is especially true in conjunction with institutional structures like *CBC*, which shield household incomes and permit investment-driven revenues to flow freely, consistent with the Kaleckian emphasis on the connection between investment, profit rates, and aggregate demand (Kalecki, 2013).

Based on these results, future research could examine the connection between investment, wages, and collective bargaining in the short-term by extending the sample size beyond Southern Europe or by including additional macroeconomic *controls*. In-depth research into the conditional impacts of public spending and credit across different investment regimes could complement this investigation by showing whether or not the observed short-term negative relationship is exclusively cyclical or if it

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may actually be structural in nature. Another option is to extend the time horizon to include long-term growth dynamics, assessing if the wage share sign turns positive, like it does in Alcobia and Barradas' research. If it does, that strengthens the argument that pro-labor public policies are more fit for the Southern European economies (Alcobia and Barradas, 2024; Kalecki, 2013; Stockhammer, 2016).

Having these considerations in mind, a refocus on demand-side economics and full employment goals, like Alcobia and Barradas (2024) recommend, could be helpful in reversing the decreasing trend of wage share in Southern Europe (*Figure 1*). Examples of such policies include the repeal of the regime of unilateral expiry of collective bargaining, de-flexibilization of the labor market, the general strengthening of the employment protection legislation (EPL) and the elevation of the minimum wage to reflect current inflation levels and productivity increases, as well as other measures that ensure there is a reinstatement of the power that trade unions lost during the Troika-adjustment process.

Moreover, Alcobia and Barradas (2024) recommend the promotion of workers' inclusion in the board of directors of public-owned firms, therefore promoting industrial democracy. In addition, taxing large corporations, wealth, capital gains, rich inheritances, and financial assets could shrink the earnings constituting the profit share (Alcobia and Barradas, 2024). Lastly, an emphasis on productive specialization, targeted subsidies to strategic SMEs, and industrial policies that expand productive investment could accompany the prior suggestions (Kalecki, 2013; Storm and Naastepad, 2013).

This research does not contain policy actionable advice, as that was not its goal; however, evidence implies that policies and institutional structures supporting productive investment, therefore moving the functional income distribution towards labor, leads to short-term output growth, which is consistent with Kalecki's hypothesis. Subsequent researchers, focusing on public policy, could assess the validity of these economic devices in different macroeconomic environments and across various regions, to see if results hold or even if they can be generalized. It can be of excellent value to investigate if investment-led, wage-supported short-term growth's efficacy still holds up across different circumstances and institutional arrangements.

CHAPTER V

CONCLUDING REMARKS

At the beginning of this research, it was established that its basis would be Alcobia and Barradas' (2023; 2024) extensive work on the topic of functional income distribution. The scholars found that increases in the wage share had a positive impact on long-term growth: First in Portugal, then in OECD countries. The research developed here was intended to verify if those deductions were also detected in the short-term.

This work proposes to answer the question: To what extent does the wage share stimulate growth in Southern Europe, and how can Kaleckian variables help explain its short-term progress? So, to frame the discussion, functional income distribution was defined as the division of national economic output between workers and capitalists (or factors of production), with wage share referring to workers' portion and profit share to capital owners (Dünhaupt, 2013). Political economists typically describe this relationship through this mechanism: Labor share rises when wages grow faster than productivity and, when productivity outpaces wage growth, real wages decline, increasing profits (Razgūnė and Lazutka, 2015).

Moreover, a chronological literature review about political economists' understanding of functional income distribution and how it affected the economy was constructed for historical context. David Ricardo and Marx pioneered these theories, with the former focusing on the law of diminishing returns and Malthusian population theory, and the latter emphasizing the degree of exploitation, contingent on the correlation of forces between the capitalists and workers, as the main factors that determined income distribution in a given economy at a certain period. Crucially, they did not see it as fixed (Nunes, 2016; Marx, 2018). Smith actually foreshadowed Marx's theory in 1776 (Alcobia and Barradas, 2023), though it was not as central to his critique of early-stage capitalism as it later became to Ricardo and Marx.

In striking contrast, neoclassical economists asserted that wages and profits (factor prices) were determined by the supply and demand forces in a perfectly competitive market. They overlooked Marx's warning about how capitalists exploit the surplus labor force to limit wage growth, regardless of demand changes, and the market's inherent tendency toward concentration (Marx, 2018; Kalecki, 2013). To the neoclassical economists, this relationship may be represented by a Cobb-Douglas production function, where capital and labor are molded by production technology, with workers and employers supposedly benefiting equally from technological progress (Kristal, 2010). Moreover, the constancy of factor shares

was observed and subsequently accepted by neoclassical economists throughout the 20th century with minimal resistance (Razgūnė and Lazutka, 2015).

The constancy of factor shares ended up becoming a stylized fact of economic growth (Kaldor, 1961; Krämer, 1996), though Keynes (1939) and Solow (1958) had already challenged this view. Only since the 1980s have political economists seriously reengaged with functional income distribution, due to the clear evidence of a declining labor share (Alcobia and Barradas, 2023). Orthodox macroeconomic models assert that income distribution has no long-run impact on growth, claiming growth is influenced solely by supply-side variables, which led many governments to implement pro-capital policies (Lavoie and Stockhammer, 2013). In contrast, post-Keynesian and Kaleckian economists reject this assumption by stressing aggregate demand's role as a driver of private investment, guided by expectations of future demand (Kalecki, 2013), and as a contributor to the Keynesian multiplier effect (Razgūnė and Lazutka, 2015).

Heterodox political economy literature discerns between wage-led and profit-led growth models, as clarified in the literature review (Alcobia and Barradas, 2023). The wage-led economies are those where firms can expand production to meet sudden increases in aggregate demand; profit-led economies are those where a higher labor share reduces profit margins, thus suppressing investment. The efficacy of pro-labor policies, those that shift income toward workers, depends on the interrelationship between household consumption, private investment, and net exports (Jungmann, 2021). Alcobia and Barradas (2023; 2024) concluded that the OECD economies have wage-led characteristics and consequently benefit more from pro-labor public policies.

While the early 2000s saw signs of modernization and expanded welfare in Southern Europe, this apparent progress was influenced, and in many ways limited, by the macroeconomic restrictions imposed by Eurozone integration, including the Maastricht convergence criteria and the loss of autonomous monetary policy (Pedaliu, 2010). However, their integration was asymmetric relative to Central European economies due to constraints including reduced competitiveness, widespread tax evasion, and a large and persistent informal economy (Pedaliu, 2010), all of which became exposed in the GFC. These countries then faced external interventions via Troika-led adjustment programs and experienced structural weakening from a newfound reliance on internal devaluation, fiscal consolidation, and EU structural funds, which fostered dependency rather than promoting genuine structural change (Matthijs, 2014). Crucially, these vulnerabilities were not only domestic but also embedded in the architecture of the Eurozone itself: The absence of fiscal integration, the rigidity of monetary rules, and the asymmetric burden of adjustment placed on deficit countries all amplified the crisis in Southern Europe (Barradas *et al.*, 2018).

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As for methodological options, this research's design adds credibility to its findings. By choosing a fixed-effects background on a balanced panel of four Southern European economies and applying extensive robustness checks, all of which are available in the *Attachments*, the analysis ensured that the outcomes are not driven by sample composition or estimation biases. Even though the small number of cases limits external generalizability, the model captures short-run tendencies with reliability. The econometric model is complemented by an illustration of the wage share's evolution (*Figure 1*), which reveals a general downward trend from the early 90s to the late 2000s. The trend reached its lowest point in 2017, followed by an abrupt increase peaking around 2020, before dropping again, potentially due to Covid-19's mass layoffs. It is, however, important to clarify that because the wage share is measured relative to GDP, fluctuations in GDP, especially during recessions, can create pronounced spikes or drops in the wage share that may not correspond directly to changes in wage levels.

From the outcome, the first inference is that an increase in the wage share has a negative impact on growth. However, the interaction of the variable with investment shows that the effect of one depends on the other. As per Kaleckian theory, when wages increase, it may squeeze profits and, consequently, production, but if investment is high, it can offset this inverse relationship by creating income for workers that compensates for the higher corporate costs and actually raises profits (Kalecki, 2013). The argument is that the extra demand makes up for losses in production costs due to workers' higher propensity to consume. OECD data (*Table 6*) shows that investments gradually declined from 1993 to 2023 in Southern Europe, possibly as a combined result of austerity, high public debt, labor market liberalization, and accelerated financialization, which allowed profits to materialize via financial channels instead of productive investment and constrained firms' motive to amplify productive capacity (Matthijs, 2014; Perez and Matsaganis, 2018; Baccaro and D'Antoni, 2022; Lavoie, 2018; Barradas *et al.*, 2018; Moury and Afonso, 2019).

The negative short-run consequences from wage raises that the model displays may suggest an economic environment where the accelerator role of investment is reduced. Since investment levels are structurally low, the temporary wage increases are less likely to be compensated for by demand created through the investment channel. In the long-run, however, the transitory shocks from those wage raises may equalize, while workers' propensity to spend maintains the extra aggregate demand, safe for investing. This theory could explain the differences between the short- and long-term, as seen in Alcobia and Barradas' (2023; 2024) outcomes.

Investment is shown to have a positive effect on output growth, as expected, following Kaleckian theory. Investment leads to greater profits, which allows for expanded production and employment (*Table 7*). The impact is immediate; investment directly promotes growth in a capitalist economy, according to Kalecki. Data from the OECD and the World Bank corroborate this thesis by demonstrating that periods of lower growth in Southern Europe correspond to lower investment than those of more

accelerated growth rates. Inferring from this, lower investment during and after the financial crisis may have suppressed demand and output. Nonetheless, as emphasized in the prior section, conclusions from this oversimplified correspondence must be taken as indications for future investigation, not as absolute facts.

Overall, the model exhibited investment as the engine of short-term growth, *per se*. Its effect is positive on its own and amplified by its interaction with wage share. When wage share is high, even temporary increases in investment translate into immediate output gains. This is reinforced by the marginal effects presented in *Table 5*, which show that investment has a stronger impact on growth when the wage share is higher. Importantly, as shown in *Table 6*, where Southern Europe's investment and GDP growth values are put beside one another, this theory is supported by the correlation of periods of lower investment with lower growth.

Kalecki writes about the contradictory effect of labor share growth on GDP growth. On the one hand, it depresses private investment through the rise of corporate costs; on the other hand, it promotes investment by positively and significantly influencing demand. In Southern Europe, the latter may have more weight than the former in the short-term. This could mean that the wage share is endogenously determined (Kalecki, 2013).

Additionally, collective bargaining coverage has a positive effect on GDP growth in the model. From a Kaleckian standpoint, collective bargaining models the distribution and solidity of wages (Kalecki, 1971). In simple terms, higher coverage is associated with higher confidence to spend from households, since income becomes more stable, which maintains domestic consumption and encourages firms to invest. In addition, such a stabilizing effect softens the short-term drag from wage raises, improving the already positive impact of investment on growth. Correspondingly, the austerity period in Southern Europe eroded collective bargaining and reduced the ability of wages to work as an anchor for aggregate demand, worsening the contractionary effects of internal devaluation strategies and transmitting shocks directly into consumption and investment (Ocaña *et al.*, 2025). This short-run destabilization may explain Southern Europe's more prolonged stagnation following the GFC, compared to Central Europe.

Portugal and Spain's case lends credence to the theory, given that these countries maintained a robust bargaining structure relative to Greece, and exhibited comparatively stronger employment gains, keeping a steadier convergence with the EU fiscal indicators (Ocaña *et al.*, 2025). In Greece, however, collective bargaining institutions were more meaningfully dismantled under austerity reforms, which is linked to its feebleness in the labor market and slower post-pandemic recovery (Ocaña *et al.*, 2025). Overall, CBC may actually be a determinant of short-term economic stability, within the asymmetrical restrictions of the Eurozone's governance architecture (Baccaro and D'Antoni, 2022). Regardless, it is

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important not to overstate the importance of these inferences due to the variable's non-stationarity and missing values, (again) despite robustness checks.

As for the control variables, public expenditure and domestic credit both have a negative impact on growth in the model. An acceleration in credit expansion is negatively correlated with GDP growth, which, from a Kaleckian standpoint, could reflect the tendency for credit growth to emerge in economic downturns (countercyclical supply of credit). Public spending, on the other hand, requires a more convoluted explanation. After all, high government expenditure in Southern Europe happens to correspond to crisis periods, as the data shows (*Table 8*), when growth was lower. In other terms, there is a possibility that this coefficient is capturing the endogeneity of fiscal policy: Total spending rises during downturns, which mechanically correlates with weaker output. Therefore, government expenditure might not necessarily cause lower growth in Southern Europe; instead, the short-run tendencies of the model may be negatively correlated with growth due to crisis-period fiscal responses. Data shows government expenditure was higher during the 2010–2014 crisis years than in the 2015–2019 recovery. Further research is required in order to make stronger inferences.

Furthermore, post-GFC, wage boosts were frequently not met with enough investment to channel extra income into productive demand (Ocaña *et al.*, 2025). Public expenditure and credit expansion often served as reactive mechanisms in this context, with credit expanding to cover household or liquidity gaps, and public spending rising as a countercyclical measure. From 2003 to 2012, a period marked by austerity and high public debt (Stockhammer, 2016), average investment dropped considerably; during the same time-frame, domestic credit accelerated, and government expenditure rose to deal with the instability. This may also help explain why these variables were negatively correlated with GDP growth. Without enough productive investment, these expansions might merely reflect crisis management, not demand-creating measures. From 2017 until 2023, credit and government spending flatlined, no longer implying economic stress. Hence, Southern European economies are driven primarily by investment, with credit and fiscal policy acting as secondary factors. Lastly, *CBC*, by ensuring steadier wages, allows for investment to circulate more efficiently through the market. That much has been established. However, in economies with weaker *CBC*, such as Greece, credit expansion and public spending grew to meet the lack of demand, lending credence to the hypothesis that these variables act more as reactive mechanisms in the short-term.

Lastly, to answer the research question: When taken together, these verdicts indicate that, in the short-term, wage share encourages growth in Southern Europe, mainly by enhancing the impacts of investment on aggregate demand, although its efficacy is conditioned by institutional structures such as *CBC*. Consequently, the research empirically supports Kaleckian growth mechanisms and simultaneously demonstrates that the magnitude and persistence of such effects depend on the prevailing investment setting and structural restraints. Hence, the adoption of pro-labor policies makes sense, based on

the outcomes. Moreover, further investigation with access to more complete data on collective bargaining coverage and with more economies could be beneficial to grasp the short-run tendencies of growth to a greater degree and to either confirm or deny the post-Keynesian prerogative, supported by this work, that, at least for the assessed variables, the Southern European economies are wage-led models.

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ATTACHMENTS

ATTACHMENT A: ROBUSTNESS CHECKS

Figure 3. Main regression table, using an unbalanced panel.

. misstable summarize cbc				Obs<.		
Variable	Obs=.	Obs>.	Obs<.	Unique values	Min	Max
cbc	18		106	55	14.2	100
. xtreg gdp D_c_ws D_c_gfcf D_c_ws_c_gfcf D_cr ps cbc, fe						
Fixed-effects (within) regression				Number of obs	=	102
Group variable: id				Number of groups	=	4
R-squared:				Obs per group:		
Within = 0.7031				min =		24
Between = 0.7695				avg =		25.5
Overall = 0.6384				max =		27
corr(u_i, Xb) = -0.4658				F(6, 92)	=	36.32
				Prob > F	=	0.0000
gdp	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
D_c_ws	-.7661709	.1812684	-4.23	0.000	-1.126186	-.4061561
D_c_gfcf	1.026371	.1521072	6.75	0.000	.7242735	1.328469
D_c_ws_c_gfcf	.1137175	.0305083	3.73	0.000	.0531254	.1743097
D_cr	-.044254	.0256413	-1.73	0.088	-.0951797	.0066718
ps	-.4226131	.0598887	-7.06	0.000	-.5415572	-.3036691
cbc	.0315645	.0116434	2.71	0.008	.0084397	.0546893
_cons	18.3142	3.19707	5.73	0.000	11.96454	24.66386
sigma_u	1.0892811					
sigma_e	1.6812621					
rho	.29565949	(fraction of variance due to u_i)				
F test that all u_i=0: F(3, 92) = 6.21				Prob > F = 0.0007		
. estat ic						
Akaike's information criterion and Bayesian information criterion						
Model	N	ll(null)	ll(model)	df	AIC	BIC
.	102	-254.4027	-192.4629	7	398.9258	417.3006
Note: BIC uses N = number of observations. See [R] IC note .						

Description: The figure includes the main regression table along with the *estat ic* model fit outcomes, conducted using unbalanced panel data (*CBC* incomplete).

Figure 4. Main regression table, using *MI* estimates.

```
. mi estimate: xtreg gdp D_c_ws D_c_gfcf D_c_ws_c_gfcf D_cr ps cbc, fe
```

Multiple-imputation estimates	Imputations	=	20
Fixed-effects (within) regression	Number of obs	=	120
Group variable: id	Number of groups	=	4
	Obs per group:		
	min	=	30
	avg	=	30.0
	max	=	30
	Average RVI	=	0.1675
	Largest FMI	=	0.4723
	Complete DF	=	110
DF adjustment: Small sample	DF: min	=	36.01
	avg	=	85.94
	max	=	104.08
Model F test: Equal FMI	F(6, 104.3)	=	34.13
Within VCE type: Conventional	Prob > F	=	0.0000

gdp	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
D_c_ws	-1.052927	.1805173	-5.83	0.000	-1.411038	-.6948167
D_c_gfcf	1.137742	.162756	6.99	0.000	.814989	1.460494
D_c_ws_c_gfcf	.1163748	.0315015	3.69	0.000	.0538525	.1788971
D_cr	-.092777	.0270799	-3.43	0.001	-.1464771	-.039077
ps	-.3894311	.0583269	-6.68	0.000	-.5052619	-.2736004
cbc	.0414876	.0163023	2.54	0.015	.0084254	.0745498
_cons	16.0552	3.482567	4.61	0.000	9.104369	23.00603
sigma_u	.96759825					
sigma_e	2.0310426					
rho	.18497846					(fraction of variance due to u_i)

Note: sigma_u and sigma_e are combined in the original metric.

Description: The figure features the main regression table using Stata's multiple imputation (*MI*) technique to address missing *CBC* values.

ATTACHMENT B: OECD ESTIMATES ROBUSTNESS CHECK

Figure 5. Main regression table, with Italy *CBC* values fixed at 80%.

```
. xtreg gdp D_c_ws D_c_gfcf D_c_ws_c_gfcf D_cr ps cbc, fe vce(cluster id)
```

Fixed-effects (within) regression	Number of obs	=	102
Group variable: id	Number of groups	=	4
R-squared:	Obs per group:		
Within = 0.7018	min	=	24
Between = 0.8569	avg	=	25.5
Overall = 0.6265	max	=	27
corr(u_i, Xb) = -0.5116	F(3, 3)	=	.
	Prob > F	=	.
(Std. err. adjusted for 4 clusters in id)			

gdp	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
D_c_ws	-.7669834	.2075272	-3.70	0.034	-1.427428	-.1065393
D_c_gfcf	1.026869	.2022626	5.08	0.015	.3831795	1.670559
D_c_ws_c_gfcf	.1140003	.0302921	3.76	0.033	.0175974	.2104032
D_cr	-.0403739	.0115137	-3.51	0.039	-.0770155	-.0037323
ps	-.4195509	.048246	-8.70	0.003	-.5730911	-.2660107
cbc	.0379392	.00711271	5.32	0.013	.0152574	.0606209
_cons	17.86597	2.501198	7.14	0.006	9.906044	25.8259
sigma_u	1.1945497					
sigma_e	1.6851636					
rho	.33443657					(fraction of variance due to u_i)


```
. estat ic
```

Akaike's information criterion and Bayesian information criterion

Model	N	ll(null)	ll(model)	df	AIC	BIC
.	102	-254.4027	-192.6993	3	391.3986	399.2736

Description: The figure features the main regression table using data with Italy's *CBC* values fixed at 80, instead of OECD's estimates (fixed at 100%).

ATTACHMENT C: HAUSMAN TEST

Figure 6. Hausman test output.

```
. hausman fe re
```

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	Std. err.
D_c_ws	-1.032197	-.9674736	-.0647233	.
D_c_gfcf	1.166006	1.181796	-.0157898	.
D_c_ws_c_g~f	.1041144	.1211929	-.0170785	.
D_cr	-.1124219	-.0851681	-.0272538	.
ps	-.3940868	-.2971997	-.0968871	.0351608
cbc	.0313885	.0191653	.0122232	.005152

b = Consistent under H0 and Ha; obtained from `xtreg`.
 B = Inconsistent under Ha, efficient under H0; obtained from `xtreg`.

Test of H0: Difference in coefficients not systematic

$\chi^2(6) = (b-B)'[(V_b-V_B)^{-1}](b-B)$
 = 27.45
 Prob > χ^2 = 0.0001
 (V_b-V_B is not positive definite)

Description: The figure shows the Hausman test output, where the null hypothesis is strongly rejected in favor of the *fe* model.

ATTACHMENT D: MODIFIED WALD TEST

Figure 7. Modified Wald test (`xttest3`) output.

```
. xttest3
```

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

$\chi^2(4) = 1.96$
 Prob > $\chi^2 = 0.7422$

Description: The figure shows the Modified Wald test results, which reveal arbitrary heteroskedasticity and serial correlation within panels and, thus, justify the use of standard errors clustered at the country level.

ATTACHMENT E: *VIF* DIAGNOSTICS

Figure 8. *VIF* diagnostics.

. vif		
Variable	VIF	1/VIF
D_cr	1.25	0.801362
D_c_ws	1.18	0.844918
cbc	1.16	0.861575
ps	1.12	0.892888
D_c_gfcf	1.10	0.908055
D_c_ws_c_g~f	1.08	0.926111
Mean VIF	1.15	
.		

Description: The figure presents the variance inflation factor (*VIF*) diagnostics, which confirm the absence of severe multicollinearity among regressors.

ATTACHMENT F: LAG LENGTH SELECTION

Table 9. *AIC/BIC* outcomes (from Stata).

Lag Length ↓	<i>AIC</i>	<i>BIC</i>
(Main Regression)	510.74274	519.10522
1	603.14162	611.40339
2	597.72056	605.87606
3	585.36558	593.41198
4	566.40787	574.34104