

## ORIGINAL ARTICLE OPEN ACCESS

# Financialisation and the (De-)Unionisation of Workers in Portugal

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## ABSTRACT

Over the last five decades, the degree of unionisation of workers has been decreasing and, therefore, by inadvertently accepting the deterioration of labour relations, the loss of labour rights, and the increase in the exploitation of labour all over the world, workers have not genuinely contested the neoliberal agenda and the deregulation and flexibilisation of the labour market. Our argument to explain this puzzling paradox of worsening labour conditions yet a lesser degree of unionisation finds that this is due to the financialisation of workers. On the one hand, workers with financial assets tend to reduce their unionisation due to their more financially solid position, pro-capital predisposition, perceived disconnection from union priorities, access to attractive remuneration benefits, a (psychological) sense of being owners (employers) and an alignment with capital's (employers') interests. On the other hand, workers with financial liabilities tend to reduce their unionisation due to their more financially fragile position, fears of job and income loss and concerns about default, reluctance to incur the immediate costs of monthly union dues, worries about the social stigma linked to potential default and a tendency to prioritise individual interests over collective action. This paper aims to study the relation between the financialisation of workers and their unionisation by performing a time series econometric analysis centred on Portugal over the period from 1980 to 2023. Our results confirm that the financialisation of workers exerts a negative effect on the degree of unionisation in Portugal. The financialisation of workers has indeed been one of the main factors behind the deunionisation in Portugal since the 1980s.

**JEL Classification:** C22, G51 and J51 and J53

## 1 | Introduction

Labour conditions have been worsening, workers have been losing some labour rights, and the degree of exploitation of labour has been increasing all over the world since the 1970s and 1980s (Korpi and Shalev 1979; Gouzoulis 2023; Prata Feres et al. 2024), which is observable in the decrease of the labour income share and in stagnant (or falling) wages (Gouzoulis 2021, 2022; Barradas 2023; Alcobia and Barradas 2023 and Alcobia and Barradas 2024; Gouzoulis et al. 2023a); the rise of top management compensation vis-à-vis the working class and blue-collar workers

and the widening of inequalities in personal income (Barradas and Lakhani 2024; Barradas 2025a); the proliferation of atypical work (e.g., temporary or fixed-term contracts, dispatched contracts, involuntary part-time jobs and multiple job-holding) and the prevalence of non-standard labour contracts (Kalleberg 2000, 2009; Chan 2023; Gouzoulis et al. 2023b and 2025); the increase in job insecurity, instability, insufficient social protection, precariousness, higher flexibility, scarcer incentives and lower-paid jobs (Tridico and Pariboni 2018; Pariboni and Tridico 2020); the surge of emotional abuse and/or other threats (e.g., discrimination, bullying, harassment and violence) in the workplace

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(Buttigieg et al. 2011); the deterioration in the balance between work and life and the intensification of work pressure (Chatrakul Na Ayudhya et al. 2019); and the spread of informal work and non-contract workers (Chan 2023).

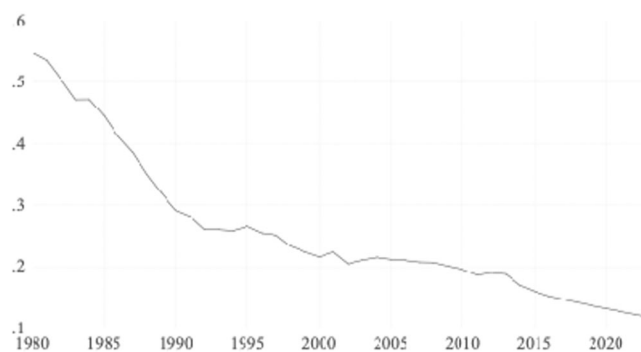
Nonetheless, workers have been decreasing their degree of unionisation in the last five decades and, therefore, have not genuinely contested the neoliberal agenda and the deregulation and flexibilisation of the labour market. This has been because they have been inadvertently accepting the deterioration of labour relations, the loss of labour rights, and the increase in the degree of the exploitation of labour all over the world during that time (Gouzoulis 2024). This paradox of worsening labour conditions yet a lesser degree of unionisation is quite puzzling for scholars in the field of industrial relations. Our investigation finds that this is due to the financialisation of workers and their higher and stronger engagement with the realm of finance (Lapavistas 2011; Van Der Zwan 2014; Gonçalves and Barradas 2021).

This paper aims to study the relation between the financialisation of workers and their unionisation by performing a time series econometric analysis centred on Portugal over the period from 1980 to 2023. This paper presents at least four different contributions to the existing literature about this matter. First, this paper clarifies from a theoretical point of view the mechanisms through which the financialisation of workers through the side of both financial assets and financial liabilities has favoured their deunionisation since the 1980s. Note that the literature on industrial relations has neglected the potential negative effects of the financialisation of workers through the side of financial assets on their unionisation, despite the higher theoretical and empirical development associated to the negative effects of this financialisation through the side of financial liabilities on their unionisation (Kelly and Kelly 1994; Langley 2007; Palley and LaJeunesse 2007; Stockhammer 2009; Lazzarato 2012; Van Der Zwan 2014; Wood 2017; Sweet 2018; Gouzoulis 2023, 2024). Second, this paper identifies the determinants of unionisation in Portugal, paying particular attention to the expected negative impact caused by the financialisation of workers, for which the empirical evidence is quite limited. Gouzoulis (2024) is the only exception, in confirming a negative relation between the financialisation of workers through the side of financial liabilities and their unionisation in the cases of Japan, Sweden and South Korea. Third, this paper is centred on Portugal, for which empirical evidence is non-existent. Portugal is a very interesting case in a context in which we have also observed a general increasing trend of financialisation of workers through the side of both

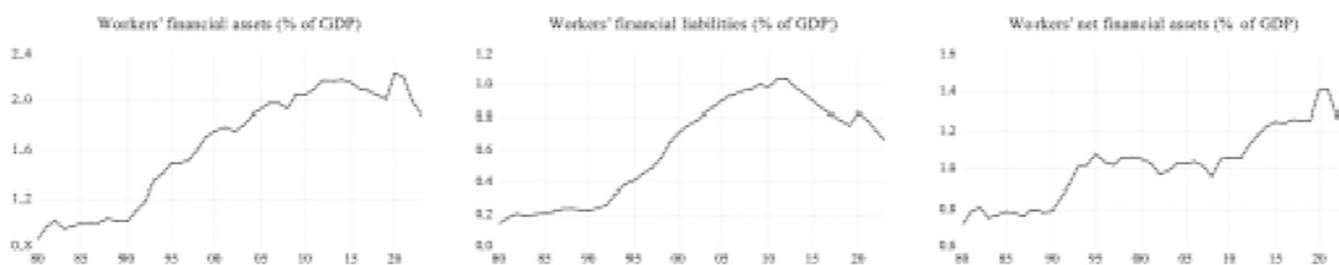
financial assets and financial liabilities and a strong decline in their degree of unionisation (Figures 1 and 2). This seems to suggest that these two stylised facts could be strongly interconnected, mainly if we take into account that Portuguese workers are the most financialised and the least unionised of the European Union (Barradas 2022a; Waddington et al. 2023; Romão and Barradas 2024). Fourth, this paper also presents the economic effects of the statistically significant estimates, which allows us to better identify the main factors behind the deunionisation in Portugal since the 1980s (McCloskey and Ziliak 1996; Ziliak and McCloskey 2004).

We rely on an aggregate equation to address the determinants of unionisation in Portugal by following a macroeconomic approach, according to which unionisation depends on the financialisation of workers and other control variables that have been theoretically and empirically identified in the literature as important determinants behind the deunionisation in the last five decades all over the world (financialisation of corporations, inflation rate, industrial workforce, public workforce, and degree of globalisation). Our estimates were produced by employing the fully modified ordinary least squares (FMOLS) estimator (Phillips and Hansen 1990), the canonical cointegration regression (CCR) estimator (Park 1992) and the dynamic ordinary least squares (DOLS) estimator (Saikkonen 1992; Stock and Watson 1993), given that our variables are integrated of order one and, at the same time, cointegrated.

We conclude that the financialisation of workers has had a negative effect on unionisation in Portugal, especially through the side of financial assets, due to their being widespread within workers in comparison to financial liabilities. The financialisation of workers has indeed been one of the main factors behind the deunionisation in Portugal since the 1980s. We also



**FIGURE 2** | Degree of unionisation in Portugal (% of total). *Source:* OECD/AIAS ICTWSS and Barradas (2024).



**FIGURE 1** | Financialisation of workers in Portugal (% of GDP). *Source:* Bank of Portugal.

conclude that the decline in industrial workforce has also exacerbated the fall in the degree of unionisation in Portugal since the 1980s, in a context in which a positive inflation rate and the expansion of public workforce were not enough to reverse the general decreasing trend of unionisation in Portugal since the 1980s.

The rest of this paper is structured as follows. Section 2 portrays a brief history of financialisation and the deunionisation of workers in Portugal. In Section 3 describe the theoretical mechanisms and the empirical evidence about the financialisation of workers, through both the side of financial assets and that of financial liabilities, and their deunionisation. Section 4 presents the model specification and hypotheses and describes the data and econometric methodology. The empirical results and discussion are reported in Section 5. Finally, Section 6 provides the main conclusions.

## 2 | Brief History of Financialisation and the (De-) Unionisation of Workers in Portugal

It is widely acknowledged that the ideas promoted by Reaganomics and Thatcherism have been widely disseminated all over the world, including in Portugal, since the 1970s and 1980s, which has happened concurrently with a strong transformation of the financial system at the level of liberalisation, deregulation and privatisation of the financial institutions (Barradas 2020, 2022b; Gouzoulis et al. 2024a). Consequently, the financial system has grown greatly and obtained a general increasing dominance over and penetration in the real economy, the general society, and the everyday life of workers, a phenomenon that is commonly referred to as financialisation (Van Der Zwan 2014).

One distinctive feature related to financialisation is the higher and stronger engagement of workers, including low income, low wealth and middle class ones, with the realm of finance (Lapavistas 2011; Van Der Zwan 2014; Gonçalves and Barradas 2021) through not only the acquisition of financial assets (e.g., currency, deposits, bonds, stocks, investment fund stocks, worker stock options, life insurance pensions, other insurance products, money market funds, cryptoassets and financial derivatives) but also the contractualization of financial liabilities (e.g., mortgage credits, car loans, consumer credits, credit cards with high credit limits or without any credit limits, overdraft bank charges with small penalties or without any penalties and student loans).

As a result, workers' financial assets and workers' financial liabilities have evidenced a steep increase in Portugal since the 1980s to unprecedented levels (Figure 1), even reaching historical maximum levels, particularly up to the Great Recession (Barradas and Tomás 2023; Romão and Barradas 2024). Portuguese workers are among the most financialised in the European Union (Barradas et al. 2018; Barradas 2022a), a process that was strongly supported by the European integration. Portugal has developed a 'bank-based' financial system, where banks play a dominant role, serving as the main agents of financialisation, particularly concerning the general workers and the provision of financial assets and financial liabilities by

acting as advisers, mediators, issuers, treasurers, and investors (Barradas 2025b). The re-privatisation of banking activities and the entry of foreign banks since the mid-1980s contributed to the modernisation and enhanced competition in the Portuguese banking system by allowing greater availability, sophistication, and diversification of financial products, sustaining a general increasing trend in the financialisation of workers through the side of both financial assets and financial liabilities (Barradas et al. 2018).

Similarly, we observe a strong decline in the unionisation in Portugal since the beginning of the 1980s (Figure 2), which seems to confirm our argument that the deunionisation in Portugal during that time cannot be dissociated from the financialisation of workers. In Portugal, as in most EU countries, the degree of unionisation is at its historically lowest levels (Waddington et al. 2023), which has led some scholars to suggest that trade unions are no longer representative of general workers (Meardi et al. 2019). Portuguese workers are among the least unionised in the European Union (Waddington et al. 2023), a pattern that has been stimulated by the neoliberal agenda, the deregulation and flexibilisation of the labour market, and the severe austerity measures imposed in the context of the last international request for financial assistance from the International Monetary Fund, the European Commission, and the European Central Bank (i.e., the so-called Troika) in May 2011 (Lima and Naumann 2023).

Indeed, the degree of unionisation in Portugal exhibited its highest historical levels in the early 1980s, due to the positive effects of the Carnation Revolution in April 1974, which established democracy in the country after 48 consecutive years of a conservative dictatorship (Lima and Naumann 2023). On the one hand, members of corporatist unions, which were mandatory under the dictatorship, were transferred to free trade unions. On the other hand, the first years of democracy were marked by strong political mobilisation in Portuguese society through collective labour action and unionisation, also visible in huge workplace assemblies and committees with demands for the purging of collaborationist managers, higher wages, better working conditions, and workers' control (Stoleroff 2016).

Since then, the erosion of trade unions in Portugal has been a stylised fact in its democracy (Stoleroff 2016; Távora 2019). As explained by Stoleroff (2016) and Lima and Naumann (2023), trade unions have been losing members and power almost continuously since the 1980s, which can be attributed to the end of the extraordinary political circumstances that favoured unionisation after the Carnation Revolution; deindustrialisation, deregulation, liberalisation, and privatisations that began in the 1990s; the proliferation of atypical work and non-standard labour contracts; globalisation and intensified international competition; the European integration process; amendments to the Labour Code in 2003; and the anti-union policies of the Troika and the Portuguese right-wing government during the adjustment programme from May 2011 to June 2014.

The relatively high level of collective bargaining coverage in Portugal, especially up to the turn of the millennium, could also explain the marked decline in the degree of unionisation since the 1980s (Addison et al. 2017). Two different factors sustained

the high bargaining coverage in Portugal during that time, namely the practice of administratively extending sectoral agreements beyond unionised workers and the practice that collective agreements remained valid until replaced by a new one (Távora 2019).

As a consequence, Portuguese trade unions have adopted a more defensive stance in the last few years, mostly focused on saving jobs and taking on a partnership role with regard to employment, training, health, safety, and social security, without attempting to make incursions into corporate power and decision-making (Stoleroff 2016).

The Portuguese case offers a particularly compelling context for assessing the potential relationship between the financialisation and deunionisation of workers. Portugal experienced an intense and early wave of financialisation, with workers among the most financialised in the European Union, while simultaneously undergoing a sharp and persistent decline in unionisation since the 1980s, with workers among the least unionised in the European Union. This trajectory unfolded in the context of democratic consolidation, neoliberal reforms, and austerity measures, providing a setting where the mechanisms linking financialisation and deunionisation can be observed with clarity and under conditions relevant to other advanced economies undergoing similar processes.

### 3 | Review of the Literature on Financialisation and (De-)Unionisation of Workers

The financialisation of workers through the side of financial assets has favoured a general increasing trend of workers' financial wealth all over the world since the 1970s and 1980s (Barradas 2022a). This trend has been supported by the proliferation of remuneration schemes in the form of stocks and/or stock options (Grigoryeva 2024) and in the form of profit-sharing (Orhangazi 2008); the strong wave of privatisation of several public corporations occurring through public offerings to promote the so-called 'popular capitalism' (Barradas et al. 2018); the retrenchment of welfare states, which has produced a decrease in the quantity and/or quality of public provision (e.g., housing, health, education, pensions, transportation) and, consequently, a rise in the demand for private provision through own housing, private health insurance, life insurance pensions and other similar financial assets (Finlayson 2009; Lapavitsas 2013); the presence of tax systems that are more favourable to income from capital (e.g., interest, dividends, rent and capital gains) vis-à-vis income from labour (e.g., wages) (Kus 2012); the general absence of taxes related to inheritances and large fortunes that have resulted in an accumulation of financial assets across different generations (Genschel et al. 2024); the development of financial technology (e.g., cashless payment systems, internet banking, mobile banking, blockchain, peer-to-peer lending, robo-advisors, regtech, insurtech, fast and automated trading platforms) that has improved the financial inclusion and a wider democratic access to financial services and financial assets (Vuković et al. 2024); the improvement in the levels of educational attainment and their beneficial impact on financial literacy and participation in financial markets (Lusardi 2019); the

lesser degree of risk aversion on the part of the baby-boomer generation vis-à-vis previous generations and the rise in the demand for riskier financial assets (Cynamon and Fazzari 2008); the persistence of low interest rates and an increased appetite for riskier financial assets (Hein 2012); the existence of asset price inflation (e.g., in stock prices) that have increased (decreased) the demand (supply) of financial assets (Hein 2012); and the spread of irrational behaviour in the financial markets for short-term gains and speculative income (Lee and Siddique 2021). All of these developments have, in combination, increased the notional or virtual wealth of workers, which, by serving as collateral, has relaxed their credit constraints and allowed them to leverage and to accumulate more and more financial assets over time (Hein 2012; Westcott and Murray 2017).

The financialisation of workers through the side of financial liabilities has promoted a general increasing trend of workers' indebtedness all over the world since the 1970s and 1980s (Barradas and Tomás 2023; Romão and Barradas 2024). This trend has been fostered by the loosening of financial regulations and the progressive relaxation of lending constraints (Justiniano et al. 2019); the higher availability of credit supported by financial innovation (e.g., debt securitisation and the 'originate to distribute' strategies of financial institutions) that have eased the access of financial institutions to funding at lower costs (Hein 2012; Barradas et al. 2018); technological progress (e.g., credit scoring models) that have improved the analysis of the credit risk of potential borrowers (Cynamon and Fazzari 2008); the emergence of new financial instruments (e.g., home equity loans and credit cards) in the field of credit (Barradas 2022a); the strong competition between financial institutions and the adoption of aggressive commercial policies in the credit segment (Stockhammer 2009); the persistence of low interest rates and cheaper costs of borrowing (Hein 2012); the availability of new and irresistible goods and services (e.g., mobile phones and other technological devices) for the majority of workers (Barba and Pivetti 2009); the consumerist influence of advertising, marketing and the mass media (Cynamon and Fazzari 2008); the aforementioned lesser risk aversion of the baby-boomer generation vis-à-vis previous generations with regard to their financial decisions and a more relaxed attitude about incurring debt (Cynamon and Fazzari 2008); the drop in the labour income share and the stagnant (or falling) wages, which has fostered the demand for credit to prevent a loss in the standard of living (Barba and Pivetti 2009); the increase in top management's compensation vis-à-vis the working class and blue-collar workers and the widening of inequalities in personal income, which has also stimulated the demand for credit to aspire to the lifestyle of the richest (Frank 2014); and the aforementioned retrenchment of welfare states, which has also boosted the demand for credit to satisfy basic needs that were previously fully satisfied by the state and/or to cover some risks that previously were fully covered by the state (Finlayson 2009; Lapavitsas 2013). All of these developments have, in combination, resulted in a deterioration of creditworthiness standards and a lessening in collateral requirements by contributing to a democratisation of credit even for low income, low wealth and middle-class workers (Cynamon and Fazzari 2008; Hein 2012).

The literature has particularly focused on the causes around the financialisation of workers, but few attempts have been made to discuss its consequences, especially with regard to industrial relations and the observable deunionisation since the 1970s and 1980s all over the world (Gouzoulis 2024). Our investigation finds that workers have been decreasing their degree of unionisation because they are strongly financialised through the side of both financial assets and financial liabilities.

With regard to the side of financial assets, we identify at least six potential mechanisms through which this financialisation could contribute to deunionisation. First, workers with financial assets are in a more financially solid position, which reduces their incentives to obtain collective support and to be unionised (Bryson and Freeman 2012). Second, workers with financial assets tends to be (at least unconsciously) more defenders of capital, which leads them to be less unionised given the harmful impact of that on the capital income share and on the prices of financial assets and, consequently, on their financial wealth (Tippet et al. 2024). As pointed out by Smith et al. (2019), there is no longer a distinction between workers and capitalists, in a context in which the majority of workers are also capitalists by receiving simultaneously income from working (labour) and income from ownership (capital). Third, workers with financial assets, especially those with higher wages, could perceive unionisation as less useful, by considering that trade unions are more focused on protecting the interests of low income, low wealth and middle-class workers instead of their own interests (Cronert and Forsén 2023; Kristal 2023). Fourth, workers with financial assets, especially those with higher wages that could also assume management positions, receive more attractive remuneration schemes and a lot of fringe benefits (e.g., health insurance, pension plans, credit cards, car, flexible schedules, childcare), which could decrease the appeal of unionisation (Kristal 2023). Fifth, workers with financial assets feel (psychologically) like owners (employers), which improves their commitment, motivation, expectations, reciprocity and productivity and minimises absenteeism, turnover intentions and conflicts in their workplaces (Carberry et al. 2024), which makes their unionisation redundant. These workers have more positive views of their employers and believe that they have more influence on the corporation, its strategy and performance (Carberry et al. 2024). Sixth, having workers with financial assets helps to solve agency problems because they have their interests more aligned with the financial interests of their employers (Pendleton and Robinson 2010; Bryson and Freeman 2018; Cappelli et al. 2019), better their relations with them (Green and Heywood 2010), and, therefore, lessens tensions and conflicts with them (Fakhfakh et al. 2019), which potentially results in a better work environment and improved job security (Olsen 2024), which motivates them to be less unionised.

In relation to the side of financial liabilities, we identify at least four potential mechanisms through which the financialisation of workers could also contribute to their deunionisation. First, workers with financial liabilities are in a more financially fragile position, which motivates a more self-disciplined attitude and risk-averse behaviour in their workplaces, due to the fear of losing their jobs (and income) and the risks of default, which prevents them from being unionised because of the fears

of being permanently replaced and/or dismissed in the medium and long term (Langley 2007; Stockhammer 2009; Lazzarato 2012; Wood 2017; Sweet 2018; Gouzoulis 2024). This happens due to the strong deregulation and flexibilisation of labour relations since the 1970s and 1980s all over the world, which has weakened the positive relation between the power of trade unions and protection from dismissal (Emmenegger 2014; Gouzoulis 2024) and the tendency of employers to replace and fire unionised workers (Stelzner 2017; Gourevitch 2018; Gouzoulis 2024). Second, workers with financial liabilities are more reluctant to be unionised to preserve their jobs and a steady flow of income until they repay their existing debts and, thus, avoid a potential default (Gouzoulis 2023, 2024). Note that unionisation implies the payment of monthly union dues, which naturally contributes to a loss of income in the short term that ultimately could compromise their financial obligations, in a context in which the decision to join a trade union and their benefits only occurred in the medium and long term (Palley and LaJeunesse 2007). This happens because non-unionised workers could be 'free-riders' by receiving the benefits due to the unionised workers, particularly in cases with wider bargaining coverage (Olson 1965; Freeman and Medoff 1984; Bryson 2008). Third, workers with financial liabilities prefer to be nonunionised to be protected from potential social stigma that would arise in case of default by reflecting a certain incompetence to successfully manage their personal finances (Wood 2017). This could be more relevant in countries that view more negatively personal insolvency, in countries with a more liberal/pro creditor bankruptcy law, in countries with lesser credit regulations by the state and/or in countries in which there is no credit directly provided by the state-owned banks to less advantaged workers (Wood 2017; Gouzoulis 2021, 2024). Fourth, workers with financial liabilities prioritise their financial obligations and, thus, evidence less solidarity and a behaviour more oriented to individualism, self-interest, rationalism, and market values, which instigates them to be nonunionised due to their lesser sense of group identification and collective action (Kelly and Kelly 1994; Van Der Zwan 2014).

Empirical evidence for the relation between the financialisation of workers and their deunionisation is quite limited. Gouzoulis (2024) is the only exception, in performing a time series econometric analysis focused on Japan, Sweden and South Korea over the period from 1965 to 2018. The author concludes that the financialisation of workers through the side of financial liabilities exerts a negative effect on the degree of unionisation in these three countries, more so in Japan and South Korea due to their lower levels of protection for indebted workers and their higher levels of social stigma toward insolvent, defaulting workers, which implies even more a self-disciplined attitude and a greater risk-averse behaviour by workers, namely with regard to their participation on trade unions. To the best of our knowledge, there is no empirical work that aims to examine the influence of the financialisation of workers through the side of financial assets on their deunionisation.

This paper aims to contribute to the literature by providing further and new empirical evidence on the relation between the financialisation of workers through the side of both financial assets and financial liabilities and their unionisation and by

employing a time series econometric analysis centred on Portugal over the period from 1980 to 2023.

#### 4 | Model Specification, Hypotheses, Data and Econometric Methodology

Our model is based on an aggregate equation to address the determinants of unionisation in Portugal by including the financialisation of workers through both the financial assets and financial liabilities sides, along with other control variables. Control variables encompass those that have been theoretically and empirically identified in the literature as relevant determinants of the degree of unionisation registered in the last five decades all over the world, namely the shareholder value primacy and the financialisation of corporations (Peters 2011; Kollmeyer and Peters 2019; Dupuis et al. 2020; Gouzoulis 2024; Gouzoulis et al. 2024b); the disinflationary process (Bain and Elsheikh 1976 and Elsheikh 1976; Western 1997; Checchi 2005); deindustrialisation and accompanying reduction in industrial workforce (Blaschke 2000; Lee 2005; Schnabel 2013; Jensen 2020); the retrenchment of welfare states and the decrease in public servants and public workforce (Visser 2002; Checchi 2005); and globalisation and the increase of openness to trade (Bluestone and Harrison 1982; Harrison and Bluestone 1988; Sasson 1996; Western 1997; Brady and Wallace 2000; Slaughter 2007; Boulhol et al. 2011). Hence, our control variables include the financialisation of corporations, the inflation rate, industrial workforce, public workforce and the degree of globalisation, which allows us to avoid the problem of omitted relevant variables and to get more consistent and efficient estimates (Brooks 2009).

We follow a macroeconomic approach that implicitly makes the assumption of the existence of a representative worker in Portugal whose behaviour in terms of unionisation does not change across time and space. This macroeconomic approach presents four different potentialities (Correia and Barradas 2021; Gouzoulis 2023). First, we are able to address the determinants of unionisation in Portugal as a whole by transcending the idiosyncrasies of each worker in each corporation, sector, industry or region. Indeed, if these determinants have a statistically significant impact on unionisation in Portugal, we are unable to address whether that impact occurs only with some workers or in some corporations, sectors, industries and regions or whether it has a more generalised impact across all workers, corporations, sectors, industries and regions in Portugal. If these determinants do not have a statistically significant impact on unionisation in Portugal, we are unable to address whether there is an impact for some workers or in some corporations, sectors, industries and regions, which however is not substantial enough to impact all workers, corporations, sectors, industries and regions as a whole in Portugal. Second, we are able to address the determinants of unionisation in Portugal covering the longest period possible, which sets the stage for microeconomic approaches at the worker level, the corporate level, the sector level, the industry level and the regional level. Third, we are able to address the determinants of unionisation in Portugal by taking into account several factors that are also predicted to have microeconomic impacts. Fourth, we are able to address the determinants of

unionisation by encompassing some long-term forces, structural adjustments and economic and social transformations that could not be addressed by microeconomic approaches, whether at the worker level, the corporate level, the sector level, the industry level and the regional level.

As previously discussed, the financialisation of workers through both the side of financial assets and that of financial liabilities should negatively impact unionisation.

Unionisation should also be negatively affected by the financialisation of corporations, as workers prefer to be non-unionised or to deunionise to mitigate the risks of redundancy because financialised corporations tend to replace unionised workers, by avoiding paying union wage premiums, with low-cost nonunionised ones to contain labour costs, have more profits, distribute high dividends, pay high interest and satisfy impatient shareholders and demanding creditors (Peters 2011; Kollmeyer and Peters 2019; Dupuis et al. 2020; Gouzoulis 2024; Gouzoulis et al. 2024b).

The inflation rate should exert a positive influence on unionisation, primarily because a rising inflation rate encourages workers to unionise to demand higher wages to not lose their purchasing power (Bain and Elsheikh 1976; Western 1997; Checchi 2005).

Unionisation should positively depend on industrial workforce and public workforce, particularly due to the fact that workers in the manufacturing industries and workers in the public sector tend to exhibit a stronger militant stance, being more unionised than workers in the nonmanufacturing industries and workers in the private sector, who normally are non-unionised, have more atypical labour contracts and/or are self-employed (Blaschke 2000; Visser 2002; Lee 2005; Checchi 2005; Schnabel 2013; Jensen 2020; Gouzoulis 2023).

Finally, the degree of globalisation should exert a negative effect on unionisation due to threat effects exerted by multinational, transnational and 'nomadic' corporations related to offshoring and/or relocating their production to countries with weaker trade unions and lower labour costs, which dissuades workers from being unionised to sustain their jobs and income (Bluestone and Harrison 1982; Harrison and Bluestone 1988; Sasson 1996; Western 1997; Brady and Wallace 2000; Zamagni 2003; Slaughter 2007; Boulhol et al. 2011).

We collected data for Portugal on a yearly basis from 1980 to 2023, comprising a total sample of 44 observations. This corresponds to the period and the periodicity for which all data were available. Effectively, the proxies to measure the financialisation of workers through the side of both financial assets and financial liabilities were only available from 1980 onwards and the majority of the proxies to measure all the variables were only available on a yearly basis. All data were collected in November 2024.

Our sample was quite suitable to produce our estimates, for three different reasons. First, deunionisation is a long-term stylised fact in Portugal, which is better captured through the use of annual data (Waddington et al. 2023). Second, we used a

relatively large sample that covers more than four decades, which allows assessing the long-term forces, structural adjustments and economic and social transformations behind the deunionisation in Portugal registered since the beginning of the 1980s. Third, our sample covers the period when the financialisation of workers gained more preponderance in Portugal, which has occurred particularly with the European integration process in 1986 and the obligation to liberalise, deregulate and privatise the financial institutions since that time (Barradas 2020).

We estimated two different models. The first one is a baseline model, according to which we addressed the effect of financialisation of workers on unionisation by taking into account separately the role exerted by workers' financial assets and workers' financial liabilities. The second one is an alternative model, according to which we addressed the general effect of financialisation of workers on unionisation by considering the role exerted by workers' net financial assets (i.e., the difference between workers' financial assets and workers' financial liabilities). This allowed us to capture the interaction between the effect of both workers' financial assets and workers' financial liabilities in only one consolidated variable and to address the robustness of our estimates according to the model chosen to assess the relation between the financialisation of workers and their unionisation.

Table 1 presents the proxies, units and sources for all the variables; Figures 1 and 2 and Figure A1 in the Appendix presents the plots for all the variables; Table A1 in the Appendix presents the descriptive statistics for each variable; Table A2 in the Appendix presents the correlations between all the variables; Table A3 in the Appendix presents the results of the conventional augmented Dickey and Fuller 1979 unit root test for each variable; and Table A4 in the Appendix presents the results of the Engle and Granger (1987) cointegration test for the baseline model and the alternative model.

The correlations between some of our variables are higher than the traditional ceiling of 0.8 in absolute terms (Table A2 in the Appendix), which implies that we cannot completely rule out the existence of severe multicollinearity (Studenmund 2016). We also examined the variance inflation factors, according to which the hypothesis of multicollinearity between all the variables is strongly rejected because all the variance inflation factors are lower than the conventional ceiling of 20 (Greene 2017).<sup>1</sup>

For all the variables, we cannot reject the null hypothesis that they have a unit root in levels but we strongly reject that they have a unit root in the first differences at the conventional significance levels (Table A3 in the Appendix). Our variables are, therefore, integrated of order one (i.e., they are non-stationary in levels but they are stationary in their first differences).

We can also confirm that our variables are strongly cointegrated in both the baseline model and the alternative model. For both models, we rejected the null hypothesis of no cointegration among all the variables at the traditional significance levels (Table A4 in the Appendix).

Our econometric methodology involved the use of the FMOLS estimator, the CCR estimator and the DOLS estimator, because these estimators were designed for cases like ours that encompass variables that are integrated of order one and, simultaneously, cointegrated. The use of these three estimators allowed us to estimate single cointegration equations to address the (long-term) determinants of unionisation in Portugal and to assess the robustness of these estimates according to the estimator employed.

The FMOLS estimator was proposed by Phillips and Hansen (1990). It employs a semi-parametric correction to eliminate the problems caused by the long run correlation between the cointegrating equation and stochastic regressors innovations. The FMOLS estimator is asymptotically unbiased and fully efficient.

**TABLE 1** | Proxies, units and sources for all the variables.

Variable	Proxy and units	Source
Degree of unionisation	Unionised workers (% of total)	OECD/AIAS ICTWSS and Barradas (2024)
Workers' financial assets	Total financial assets of households (% of GDP)	Bank of Portugal
Workers' financial liabilities	Total financial liabilities of households (% of GDP)	Bank of Portugal
Workers' net financial assets	Net financial assets of households (% of GDP)	Bank of Portugal
Financialisation of corporations	Financial payments of non-financial corporations (% of gross value added)	INE
Inflation rate	Inflation, GDP deflator (annual %)	World Bank
Industrial workforce	Workers employed in the secondary sector (% of total)	PORDATA
Public workforce	Workers employed in the public sector (% of total) <sup>a</sup>	PORDATA
Degree of globalisation	Exports and imports of goods and services (% of GDP)	World Bank

<sup>a</sup>Note that there is no available information pertaining to the number of workers employed in the general government for Portugal for the years from 1980 to 1982, from 1984 to 1985, 1987, from 1989 to 1990, from 1992 to 1995, from 1997 to 1998, and from 2006 to 2010. As such, this information was obtained through our own calculations by using the technique of linear interpolation.

The CCR estimator was created by Park (1992) and is closely related to FMOLS. The CCR estimator asymptotically eliminates the endogeneity caused by the long run correlation of the cointegrating equation errors and the stochastic regressors innovations and, simultaneously, corrects for the asymptotic bias resulting from the contemporaneous correlation between the regression and stochastic regressor errors. Estimates produced by the CCR estimator are also strongly unbiased and fully efficient.

The DOLS estimator was developed by Saikkonen (1992) and Stock and Watson (1993), who construct an asymptotically consistent and efficient estimator that also eliminates the feedback in a cointegrated system. The DOLS estimator involves augmenting the cointegration regression with lags and leads, which implies that the cointegration equation error is orthogonal to the entire history of the stochastic regressor innovations.

We employed the recent method developed by Ditzgen et al. (2025) to detect the existence of structural breaks in our sample. For the years identified as structural breaks, we introduced in our models a dummy variable ( $Dummy_{Breaks}$ ) as a deterministic regressor to ensure the stability of our estimates over time.

We also performed four diagnostic tests to ensure the adequacy and reliability of our estimates. We rely on the Harvey test, the Jarque-Bera test, the Breusch-Godfrey test, and Ramsey's RESET test to confirm that the residuals are homoscedastic, normally distributed, and not serially correlated, and to guarantee that our models are well specified in their functional forms.

Finally, we also addressed the economic effects of our long-term estimates, which allows to better identify the role of each

statistically significant variable in explaining the deunionisation in Portugal since the beginning of the 1980s (McCloskey and Ziliak 1996; Ziliak and McCloskey 2004).

## 5 | Empirical Results and Discussion

The empirical results are presented and discussed throughout this section. Table 2 presents the estimates of the degree of unionisation in Portugal for the baseline model and Table 3 the same estimates for the alternative model. All of our models do not exhibit any econometric problems, as they are well specified in their functional forms and their residuals are homoscedastic, normally distributed, and not serially correlated.<sup>2</sup> Both models describe considerably well the evolution of unionisation in Portugal since the 1980s, as suggested by the very high levels for  $R$ -squared and adjusted  $R$ -squared. The empirical results are also quite robust because our estimates did not change dramatically in terms of statistical significance and signs of coefficients across the three different estimators and/or across the two different models. All variables are statistically significant at the traditional significance levels, and six conclusions can be drawn.

First, we confirm a negative relationship between the financialisation of workers through the side of both financial assets and financial liabilities and the degree of unionisation in Portugal. This supports our argument that workers' financial assets dissuade them from being unionised due to their more financially solid position, pro-capital predisposition, perceived disconnect from union priorities, access to attractive remuneration benefits, a (psychological) sense of being owners (employers) and an alignment with capital (employers') interests (Pendleton and Robinson 2010; Bryson

**TABLE 2** | Estimates of unionisation in Portugal for the baseline model.

Variable	FMOLS	CCR	DOLS
$\beta_0$	0.282 <sup>a</sup> (0.048) [5.835]	-0.599 <sup>a</sup> (0.038) [-15.914]	-0.510 <sup>b</sup> (0.108) [-4.711]
Workers' financial assets	-0.121 <sup>a</sup> (0.020) [-6.121]	-0.031 <sup>b</sup> (0.014) [-2.274]	-0.170 <sup>b</sup> (0.040) [-4.262]
Workers' financial liabilities	-0.015 (0.020) [-0.784]	-0.115 <sup>a</sup> (0.012) [-9.623]	-0.141 <sup>b</sup> (0.029) [-4.919]
Financialisation of corporations	0.536 <sup>a</sup> (0.028) [19.287]	0.597 <sup>a</sup> (0.019) [30.786]	0.886 <sup>a</sup> (0.059) [14.837]
Inflation rate	0.312 <sup>a</sup> (0.050) [6.192]	0.145 <sup>a</sup> (0.037) [3.922]	0.490 <sup>a</sup> (0.076) [6.465]
Industrial workforce	0.265 <sup>a</sup> (0.082) [3.246]	2.076 <sup>a</sup> (0.078) [26.678]	0.573 <sup>c</sup> (0.189) [3.038]
Public workforce	0.447 <sup>c</sup> (0.258) [1.729]	1.489 <sup>a</sup> (0.159) [9.379]	3.589 <sup>a</sup> (0.508) [7.070]
Degree of globalisation	-0.173 <sup>a</sup> (0.022) [-7.959]	-0.021 (0.014) [-1.449]	0.313 <sup>b</sup> (0.066) [4.750]
Dummy <sub>Breaks</sub>	-0.003 (0.004) [-0.685]	-0.017 <sup>a</sup> (0.003) [-5.279]	-0.009 <sup>a</sup> (0.002) [-4.485]
Harvey ( $p$ -value)	0.115	0.115	0.246
Jarque-Bera ( $p$ -value)	0.051	0.051	0.000
Breusch-Godfrey ( $p$ -value)	0.151	0.151	0.131
Ramsey's RESET ( $p$ -value)	0.754	0.506	0.682
R-squared	0.923	0.788	0.999
Adjusted R-squared	0.905	0.738	0.998

Note: Standard errors are reported in (),  $t$ -statistics in [].

<sup>a</sup>Indicates statistical significance at the 1% level.

<sup>b</sup>Indicates statistical significance at the 5% level.

<sup>c</sup>Indicates statistical significance at the 10% level. Dummy<sub>Breaks</sub> takes the value of 1 for the Years 1986, 1997, 2006 and 2014, and 0 for all other years.

**TABLE 3** | Estimates of unionisation in Portugal for the alternative model.

Variable	FMOLS	CCR	DOLS
$\beta_0$	-0.078 <sup>a</sup> (0.043) [-1.808]	0.337 <sup>b</sup> (0.013) [25.277]	0.130 (0.271) [0.481]
Workers' net financial assets	-0.055 <sup>b</sup> (0.017) [-3.311]	-0.091 <sup>b</sup> (0.005) [-18.107]	0.096 (0.077) [1.251]
Financialisation of corporations	0.301 <sup>b</sup> (0.022) [13.701]	0.362 <sup>b</sup> (0.009) [39.114]	0.397 <sup>c</sup> (0.162) [2.454]
Inflation rate	0.592 <sup>b</sup> (0.041) [14.337]	0.495 <sup>b</sup> (0.016) [30.284]	0.908 <sup>c</sup> (0.279) [3.257]
Industrial workforce	1.207 <sup>b</sup> (0.072) [16.741]	0.448 <sup>b</sup> (0.023) [19.580]	0.378 (0.467) [0.808]
Public workforce	-0.623 <sup>b</sup> (0.178) [-3.500]	-1.452 <sup>b</sup> (0.053) [-27.269]	-0.320 (1.053) [-0.304]
Degree of globalisation	-0.019 (0.019) [-0.972]	-0.085 <sup>b</sup> (0.006) [-15.108]	-0.326 <sup>c</sup> (0.139) [-2.349]
Dummy <sub>Breaks</sub>	-0.003 (0.004) [-0.682]	0.005 <sup>b</sup> (0.002) [2.915]	-0.003 (0.012) [-0.220]
Harvey ( <i>p</i> -value)	0.073	0.073	0.610
Jarque-Bera ( <i>p</i> -value)	0.268	0.268	0.924
Breusch-Godfrey ( <i>p</i> -value)	0.127	0.127	0.615
Ramsey's RESET ( <i>p</i> -value)	0.551	0.376	0.679
R-squared	0.900	0.920	0.997
Adjusted R-squared	0.881	0.903	0.987

Note: Standard errors are reported in (), *t*-statistics in [].

<sup>a</sup>Indicates statistical significance at the 10% level. Dummy<sub>Breaks</sub> takes the value of 1 for the Years 1986, 1997, 2006 and 2014, and 0 for all other years.

<sup>b</sup>Indicates statistical significance at the 1% level.

<sup>c</sup>Indicates statistical significance at the 5% level.

and Freeman 2012, 2018; Cappelli et al. 2019; Fakhfakh et al. 2019; Smith et al. 2019; Cronert and Forsén 2023; Kristal 2023; Carberry et al. 2024). This also sustains our argument that workers' financial liabilities dissuade them from being unionised due to their more financially fragile position fears of job and income losses and concerns about default, reluctance to incur the immediate costs of monthly union dues, worries about the social stigma linked to potential default and a tendency to prioritise individual interests over collective action (Kelly and Kelly 1994; Langley 2007; Palley and LaJeunesse 2007; Stockhammer 2009; Lazzarato 2012; Van Der Zwan 2014; Wood 2017; Sweet 2018; Gouzoulis 2023, 2024). On average, the negative effect related to workers' financial assets is greater than the negative effect linked to workers' financial liabilities, which is probably because financial assets are more widespread among workers than financial liabilities (Figure 1 and Table A1 in the Appendix). Effectively, workers' net financial assets also exert a negative impact on unionisation in Portugal. This seems to suggest that the negative impact of the financialisation of workers on unionisation in Portugal is especially due to the role played by workers' financial assets, which represents a directly perceived benefit (e.g., financial security and independence), in a context in which the role played by workers' financial liabilities tends to represent an indirect perceived danger (e.g., financial insecurity and fears of job and income losses). As workers' net financial assets have been positive and growing in Portugal since the 1980s (Figure 1 and Table A1 in the Appendix), financial risks and fears of defaulting related to workers' financial liabilities have been completely neutralised by inducing them to be not unionised due to their more financially solid position.

Second, we also report strong evidence that the financialisation of corporations exerts a positive impact on unionisation in Portugal.<sup>3</sup> This counterintuitive result does not corroborate the

theoretical beliefs that the acceleration of the financialisation of corporations persuade workers to deunionise to moderate the risks of redundancy because financialised corporations tend to replace unionised workers, by avoiding paying union wage premiums, with low-cost nonunionised ones to contain labour costs, have more profits, distribute high dividends, pay high interest and satisfy impatient shareholders and demanding creditors (Peters 2011; Kollmeyer and Peters 2019; Dupuis et al. 2020; Gouzoulis 2024; Gouzoulis et al. 2024b). Two potential mechanisms could explain this positive relationship. On the one hand, the acceleration of the financialisation of corporations could incite workers to be unionised to obtain higher wages and better labour conditions as a reaction to the primacy of shareholder value and the reduction of labour costs along with high levels of profits, high distributed dividends and high interest payments (Milkman 2013). On the other hand, the acceleration of the financialisation of corporations could instigate trade unions to increase their efforts and to implement several strategies and campaigns to contain the deunionisation of workers and to attract more workers to be unionised (Simms et al. 2013; Grady and Simms 2019).

Third, the inflation rate has also a positive influence on unionisation in Portugal.<sup>4</sup> This result confirms that high inflationary pressures incite workers to obtain collective support and to be unionised to demand higher wages to avoid loss of their purchasing power (Bain and Elsheikh 1976; Western 1997; Checchi 2005).

Fourth, we also find that industrial workforce and public workforce are positive determinants of unionisation in Portugal. This result corroborates the theoretical claims and the empirical evidence that workers in the manufacturing industries and workers in the public sector tend to exhibit a stronger militant stance, being more unionised than workers in the nonmanufacturing

industries and workers in the private sector, who normally are nonunionised, have more atypical labour contracts and/or are self-employed (Blaschke 2000; Visser 2002; Lee 2005; Checchi 2005; Schnabel 2013; Jensen 2020; Gouzoulis 2023).

Fifth, the degree of globalisation tends to affect negatively the unionisation in Portugal.<sup>5</sup> This is also an expected result by reiterating that an intensification of the degree of globalisation discourages workers from being unionised to sustain their jobs and income in the wake of threat effects exerted by multinational, transnational and ‘nomadic’ corporations related to offshoring and/or relocating their production to countries with weaker trade unions and lower labour costs (Bluestone and Harrison 1982; Harrison and Bluestone 1988; Sasson 1996; Western 1997; Brady and Wallace 2000; Zamagni 2003; Slaughter 2007; Boulhol et al. 2011).

Sixth, our dummy variable also has a negative effect on unionisation in Portugal. This could indicate that there were other determinants not included in the baseline model and in the alternative model that may have contributed to a reduction in the unionisation in Portugal in 1986, 1997, 2006 and 2014, respectively. As recognised by Gouzoulis (2024), the negative relationship between the dummy variable and unionisation in Portugal could be associated to the existence of a strong path-dependency in relation to workers’ attitudes towards their unionisation. The strong decline in the unionisation in Portugal since the beginning of the 1980s (Figure 1) reflects a weakening of the sense of group identification and individual union participation that by itself tends to dispel more union members, namely because there is a transmission effect to relatives, children and new generations of workers (Kelly and Kelly 1994).

Table 4 contains the economic effects of unionisation in Portugal for the baseline model and the alternative model. The

most important finding pertains to the financialisation of workers, which has definitely represented one of the main drivers behind the deunionisation in Portugal since the 1980s.

In relation to the baseline model, we are able to report that the increase of workers’ financial liabilities, the decline in industrial workforce, the deceleration of the financialisation of corporations and the surge of workers’ financial assets were the main causes behind the decline of unionisation in Portugal since the 1980s. Unionisation in Portugal during that time would have effectively been higher by about 1.0%, 0.7%, 0.7% and 0.3% on average per year if there had not been a rise of workers’ financial liabilities, a decline in industrial workforce, a deceleration of the financialisation of corporations and a surge of workers’ financial assets, respectively. During that time, a positive inflation, the expansion of public workforce and the intensification of the degree of globalisation were not enough to support higher degrees of unionisation in Portugal. Unionisation in Portugal during that time would have been lower by around 2.2%, 2.0% and 0.1% on average per year if there had not been a positive inflation rate, an expansion of public workforce and an intensification of the degree of globalisation, respectively.

With regard to the alternative model, we confirm that the expansion of public workforce, the decline in industrial workforce, the deceleration of the financialisation of corporations, the intensification of the degree of globalisation and the increase of workers’ net financial assets represented the main reasons behind the decline of unionisation in Portugal since the 1980s, which accounted for about 1.1%, 0.6%, 0.4%, 0.4% and 0.1%, respectively. During that time, a positive inflation rate was not enough to sustain higher unionisation in Portugal. Unionisation in Portugal during that time would have been lower by around 4.7% on average per year if there had not been a positive inflation rate.

**TABLE 4** | Economic effects of unionisation in Portugal.

Model	Variable	Long-term coefficient	Actual cumulative change	Economic effect
Baseline	Workers’ financial assets	−0.107	0.028	−0.003
	Workers’ financial liabilities	−0.128	0.082	−0.010
	Financialisation of corporations	0.673	−0.011	−0.007
	Inflation rate	0.316	0.070	0.022
	Industrial workforce	0.971	−0.007	−0.007
	Public workforce	1.842	0.011	0.020
	Degree of globalisation	0.070	0.017	0.001
Alternative	Workers’ net financial assets	−0.073	0.017	−0.001
	Financialisation of corporations	0.353	−0.011	−0.004
	Inflation rate	0.665	0.070	0.047
	Industrial workforce	0.828	−0.007	−0.006
	Public workforce	−1.038	0.011	−0.011
	Degree of globalisation	−0.206	0.017	−0.004

Note: The long-term coefficient corresponds to the arithmetic average of the statistically significant estimated coefficients produced by FMOLS, CCR, and DOLS. The actual cumulative change corresponds to the average of the annual growth rates of the corresponding variable from 1980 to 2023. The economic effect is calculated as the multiplication of the long-term coefficient by the actual cumulative change.

Summing up, we conclude that the financialisation of workers exerts a negative effect on the degree of unionisation in Portugal, especially through financial assets due to their being more widespread among workers in comparison to financial liabilities. The financialisation of workers has indeed been one of the main factors behind the deunionisation in Portugal since the 1980s.

## 6 | Conclusion

This paper aimed to address the relation between the financialisation of workers through the side of both financial assets and financial liabilities and their unionisation by performing a time series econometric analysis centred on Portugal over the period from 1980 to 2023.

During that time, we observed a general increasing trend of financialisation of workers visible in the strong growth of workers' financial assets and workers' financial liabilities, which occurred simultaneously with a strong decline in their unionisation. This seems to confirm our argument that the deunionisation in Portugal during that time cannot be dissociated from the financialisation of workers.

We used an aggregate equation to address the determinants of unionisation in Portugal by following a macroeconomic approach, according to which unionisation depends on the financialisation of workers through both the side of financial assets and of financial liabilities, and other control variables that have been theoretically and empirically identified in the literature as the main determinants behind the deunionisation registered in the last five decades all over the world (financialisation of corporations, inflation rate, industrial workforce, public workforce, and degree of globalisation). Our estimates were produced by employing the FMOLS estimator, the CCR estimator and the DOLS estimator, given that our variables are integrated of order one and, simultaneously, cointegrated.

We concluded that the financialisation of workers exerted a negative effect on unionisation in Portugal, especially through financial assets, due to their being more among workers in comparison to financial liabilities. The financialisation of workers has indeed been one of the main factors behind the deunionisation in Portugal since the 1980s. We also concluded that the decline in the industrial workforce also exacerbated the decline in the unionisation in Portugal since the 1980s, in a context in which a positive inflation rate and the expansion of the public sector workforce were not enough to reverse the general decreasing trend of unionisation in Portugal since the 1980s.

Our results provide very important insights for workers, employers, trade unions, policy makers and political parties. Workers should be aware that their re-unionisation is important to achieve higher wages and better labour conditions, to recover some lost labour rights, and to contain the proliferation of labour exploitation practices. Employers should incentivise organising labour through trade unions and/or workers' commissions in order to improve job satisfaction, to retain (or attract) talent and the best workers, and to avoid high levels of both absenteeism and turnover or even strong labour conflicts. Trade unions should increase their efforts around the

implementation of several strategies and campaigns to demonstrate that unionisation has important collective impacts and, thus, manage to attract more members to the unions. Policy makers should adopt public policies that encourage or protect unionisation to maintain a relatively reasonable balance of power between labour (workers) and capital (employers). Political parties should expand their discourse to show the systemic importance of policies that strengthen labour, not only for workers in a more financially fragile position but also for workers in a more financially solid position.

Our results should be read with some caution, namely because the adoption of a macroeconomic approach imposed two different limitations on our empirical work (Correia and Barradas 2021). First, we were unable to address whether the determinants of unionisation in Portugal depend on the worker's own characteristics (e.g., age, sex, qualifications, occupation, type of labour contract, household size, income and social stratum). Second, we were unable to address whether the determinants of unionisation in Portugal depend on the corporation, sector, industry and/or region of the worker's job. To overcome these limitations, further research on unionisation in Portugal should follow a microeconomic approach at the worker level, the corporate level, the sector level, the industry level and the regional level. This will allow us to assess whether the financialisation of workers through the side of financial assets, through the side of financial liabilities, and the remaining determinants, have different effects on unionisation in Portugal according to the worker's own characteristics and/or according to the corporations, sectors, industries and/or regions of the worker's job.

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### Conflicts of Interest

The author declares no conflicts of interest.

### Endnotes

- <sup>1</sup>Results of the variance inflation factors are available upon request.
- <sup>2</sup>The only exceptions occur in the baseline model, in which the normality hypothesis is rejected, and in the alternative model estimated using the FMOLS and CCR estimators, in which the homoscedasticity hypothesis is also rejected. Nonetheless, the normality hypothesis tends to be automatically satisfied due to the use of a sample with more than 30 observations, following the central limit theorem (Barradas 2020), and the homoscedasticity hypothesis would not be rejected if the ARCH test were used instead of the Harvey test.
- <sup>3</sup>The positive impact of the financialisation of corporations on unionisation in Portugal did not change if we used the net financial payments (i.e. the difference between the financial payments paid by non-financial corporations and the financial receipts received by non-financial corporations) as a percentage of the gross value added of the non-financial corporations instead of the financial payments paid by non-financial corporations as a percentage of the gross value added of non-financial corporations. Results are available upon request.

<sup>4</sup>The positive influence of the inflation rate on unionisation in Portugal did not change if we used the annual percentage growth rate of the consumer price index instead of the annual percentage growth rate of the gross domestic production deflator. Results are available upon request.

<sup>5</sup>The degree of globalisation remained its negative effect on unionisation in Portugal if we used imports as a percentage of the gross domestic product (i.e. the import penetration rate) or the net inflows related to foreign direct investment as a percentage of the gross domestic product instead of the trade as a percentage of the gross domestic product. Results are available upon request.

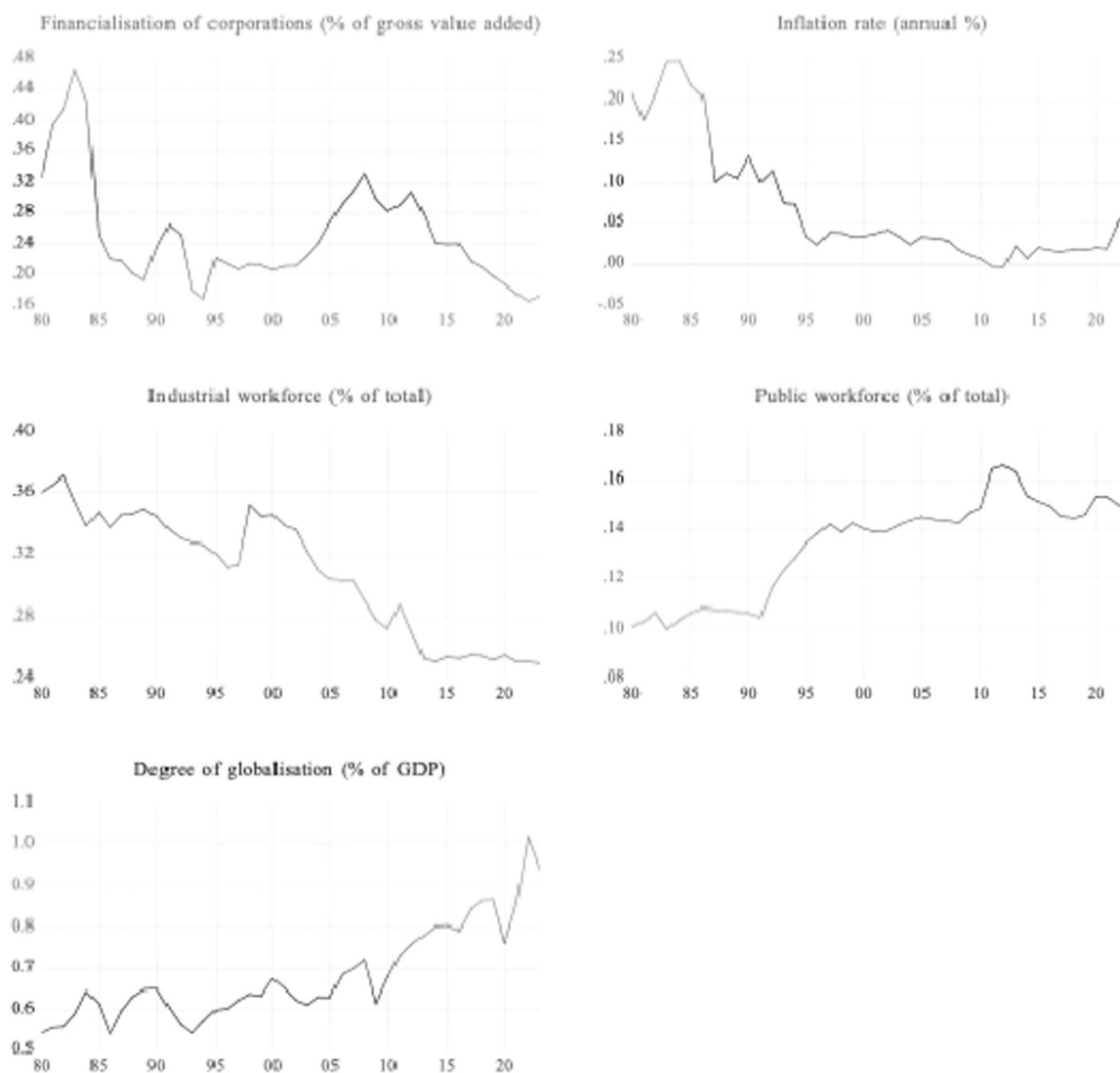
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## Appendix



**FIGURE A1** | Plots of the variables. *Source:* INE, World Bank and PORDATA.

**TABLE A1** | The descriptive statistics for each variable.

Variable	Mean	Median	Maximum	Minimum	Standard deviation	Skewness	Kurtosis
Degree of unionisation	0.257	0.216	0.548	0.119	0.117	1.129	3.286
Workers' financial assets	1.638	1.778	2.238	0.861	0.463	-0.373	1.566
Workers' financial liabilities	0.614	0.719	1.047	0.146	0.310	-0.193	1.445
Workers' net financial assets	1.024	1.032	1.410	0.715	0.186	0.120	2.220
Financialisation of corporations	0.252	0.230	0.465	0.166	0.070	1.351	4.397
Inflation rate	0.070	0.034	0.247	-0.004	0.073	1.262	3.304
Industrial workforce	0.308	0.317	0.371	0.250	0.040	-0.275	1.614
Public workforce	0.134	0.142	0.166	0.100	0.020	-0.457	1.865
Degree of globalisation	0.682	0.641	1.016	0.540	0.114	1.008	3.366

**TABLE A2** | The correlations between all the variables.

Variable	DU	FW <sup>FA</sup>	FW <sup>FL</sup>	FW <sup>NFA</sup>	FC	IR	IW	PW	DG
DU	1.000								
FW <sup>FA</sup>	-0.886 <sup>a</sup>	1.000							
FW <sup>FL</sup>	-0.802 <sup>a</sup>	0.962 <sup>a</sup>	1.000						
FW <sup>NFA</sup>	-0.871 <sup>a</sup>	0.889 <sup>a</sup>	0.730 <sup>a</sup>	1.000					
FC	0.606 <sup>a</sup>	-0.304 <sup>b</sup>	-0.160	-0.490 <sup>a</sup>	1.000				
IR	0.905 <sup>a</sup>	-0.872 <sup>a</sup>	-0.839 <sup>a</sup>	-0.774 <sup>a</sup>	0.523 <sup>a</sup>	1.000			
IW	0.796 <sup>a</sup>	-0.851 <sup>a</sup>	-0.750 <sup>a</sup>	-0.872 <sup>a</sup>	0.308 <sup>b</sup>	0.670 <sup>a</sup>	1.000		
PW	-0.873 <sup>a</sup>	0.967 <sup>a</sup>	0.929 <sup>a</sup>	0.862 <sup>a</sup>	-0.347 <sup>b</sup>	-0.891 <sup>a</sup>	-0.799 <sup>a</sup>	1.000	
DG	-0.697 <sup>a</sup>	0.698 <sup>a</sup>	0.577 <sup>a</sup>	0.779 <sup>a</sup>	-0.326 <sup>b</sup>	-0.495 <sup>b</sup>	-0.847 <sup>a</sup>	0.641 <sup>a</sup>	1.000

<sup>a</sup>Indicates statistical significance at the 1% level.

<sup>b</sup>Indicates statistical significance at the 5% level.

<sup>c</sup>Indicates statistical significance at the 10% level.

**TABLE A3** | The *p*-values from the ADF unit root test for each variable.

Variable	Level			First difference		
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
Degree of unionisation	0.058	0.182 <sup>a</sup>	0.009	0.139	0.177	0.041 <sup>a</sup>
Workers' financial assets	0.374 <sup>a</sup>	1.000	0.895	0.000	0.140	0.000 <sup>a</sup>
Workers' financial liabilities	0.595 <sup>a</sup>	0.998	0.616	0.077	0.093	0.007 <sup>a</sup>
Workers' net financial assets	0.605 <sup>a</sup>	0.063	0.950	0.000 <sup>a</sup>	0.001	0.000
Financialisation of corporations	0.230	0.606 <sup>a</sup>	0.123	0.000	0.001	0.000 <sup>a</sup>
Inflation rate	0.013	0.882 <sup>a</sup>	0.001	0.013	0.000	0.001 <sup>a</sup>
Industrial workforce	0.844	0.389 <sup>a</sup>	0.068	0.000 <sup>a</sup>	0.000	0.000
Public workforce	0.504 <sup>a</sup>	0.748	0.892	0.000	0.031	0.000 <sup>a</sup>
Degree of globalisation	0.977	0.242	0.987 <sup>a</sup>	0.000	0.003 <sup>a</sup>	0.000

Note: The lag lengths were selected automatically based on the AIC information criteria.

<sup>a</sup>Indicates the exogenous variables included in the test according to the AIC information criteria.

**TABLE A4** | The Engle and Granger (1987) cointegration test for both the baseline and alternative models.

Model	z-statistic	<i>p</i> value
Baseline	-96.199	0.000
Alternative	-92.648	0.000

Note: The lag lengths were selected automatically based on the AIC information criteria.