Financialisation, indebted workers and labour discipline: Empirical evidence on reduced strike activity in the European Union countries

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Financialisation, indebted workers and labour discipline: Empirical evidence on reduced strike activity in the European Union countries[1]

ABSTRACT

Workers are being denoted by higher resignation and conformism and lesser claimant behaviour due to their lesser engagement in strikes, which indeliberately agrees with the proliferation of neoliberal policies and a corresponding deregulation and flexibilisation of labour relations that has led to a strong deterioration of labour conditions, a loss of labour rights and an increase in labour exploitation all over the world in the last five decades. Our argument to explain this puzzling paradox of worsening labour conditions yet less strike activity emphasises that as a result of their more financially fragile position, indebted workers evidence a more self-disciplined attitude and risk-averse behaviour in their workplaces in order to retain their jobs (and income) and honour their financial obligations, which then constrains their claims for higher wages and better labour conditions through engagement in strikes. This study assesses the influence of worker indebtedness on strike activity by performing a panel data econometric analysis from 1995 to 2022 that is focused on the European Union countries. Our results support our argument by confirming that worker indebtedness negatively impacts strike volume, strike participation and strike duration in the European Union countries. Our results also show that this negative impact is stronger in the European Union countries with the highest levels of worker indebtedness. In addition, our results corroborate that the growth in worker indebtedness is even one of the main drivers behind the decline of strike activity in the European Union countries since the mid-1990s.

KEYWORDS

Financialisation, Labour Discipline, Strike Activity, European Union, Panel Data, Fixed Effects Two-Stage Least Squares.

JEL CLASSIFICATION: C23, J21 and J52 and J81

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1. INTRODUCTION

Industrial action through labour conflict, labour unrest, protests, picketing, lockouts, stoppages and/or strikes has historically been one of the fundamental means available to workers and their organisations to solve labour disputes and promote their economic and social interests, namely through higher wages and better labour conditions (Chan, 2023; Gouzoulis, 2023). Nonetheless, in the last five decades, workers have been denoted by higher resignation and conformism and lesser claimant behaviour due to their lesser engagement in strikes (Godard, 2011; Kelly, 2015), which indeliberately agrees with the dissemination of neoliberal policies and the concomitant deregulation and flexibilisation of labour relations that has resulted in a strong deterioration of labour conditions, a loss of labour rights and an increase in labour exploitation all over the world (Korpi and Shalev, 1979; Gouzoulis, 2023; Barradas, 2024a; Feres et al., 2024).

This paradox of worsening labour conditions yet less strike activity, typically known as 'labour quiescence' (Shalev, 1992), is somewhat puzzling in the field of labour relations. Our argument asserts that indebted workers, due to their more financially fragile position, evidence a more self-disciplined attitude and risk-averse behaviour in their workplaces that hampers their requests for higher wages and better labour conditions by engagement in strikes in order to retain their jobs (and income) and to honour their financial obligations (Langley, 2007; Stockhammer, 2009; Lazzarato, 2012; Stelzner, 2017; Wood, 2017; Gourevitch, 2018; Sweet, 2018; Grady and Simms, 2019; Gouzoulis, 2023; Barradas, 2024a).

This study analysed the effect of workers' indebtedness on strike activity by performing a panel data econometric analysis from 1995 to 2022 that was focused on the European Union (EU) countries. This paper extends the existing literature on this matter by offering at least five novelties. First, this paper identifies the determinants of strike activity in the EU countries, paying particular attention to the expected negative effect caused by worker indebtedness, for which the empirical evidence is limited (Barradas, 2024a). Gouzoulis (2023) and Barradas (2024a) are the only two that have reported a negative relationship between worker indebtedness and strike activity in the specific cases of Japan, Korea, Sweden, the United Kingdom and the Unites States and in the case of Portugal, respectively. Second, this paper is centred on the EU countries, for which empirical evidence is lacking. The EU countries are an interesting case study because worker indebtedness has denoted a strong increase and strike activity has significantly decreased since the mid-1990s, particularly up to the Great Recession (Figure 1). This seems to suggest that these two stylised facts could be strongly interrelated. Third, a panel data econometric analysis was conducted in the study, which provides several advantages vis-à-vis a cross-sectional econometric analysis and/or time series econometric analysis due to the possibility of collecting more observations and larger samples with higher heterogeneity and less collinearity, thereby favouring more consistent and more efficient estimates (Brooks, 2009). Note that the only two existing empirical works about the relationship between worker indebtedness and strike activity performed time series econometric analysis (Gouzoulis, 2023; Barradas, 2024a). Fourth, this study incorporated a higher sample variability, namely by including different EU countries that present a certain historical, social, economic and institutional heterogeneity along with periods of a general increasing trend or periods of a general decreasing trend of worker indebtedness (Figure 1). As argued by Wooldridge (2019), the use of samples with higher variability also implies obtaining more consistent and more efficient estimates. Fifth, this paper aims to identify not only the determinants of strike activity but also the respective drivers, which allows a better assessment

of the role of the rise of worker indebtedness on the decline of strike activity in the EU countries since the mid-1990s (McCloskey and Ziliak, 1996; Ziliak and McCloskey, 2004).

Our conceptual model relies on a macroeconomic approach according to which strike volume, strike participation and strike duration depend on worker indebtedness and other control variables that incorporate the traditional determinants of strike activity identified in the literature (macroeconomic performance, inflation rate, industrial work, public work, degree of globalisation and unionisation rate) and allow problems related to omitted relevant variables to be avoided so that more consistent and more efficient estimates can be obtained (Brooks, 2009). Estimates are produced by employing the fixed effects two-stage least squares (FE2SLS) estimator to take into account the heterogeneity across the EU countries and to overcome the potential problems of endogeneity in our conceptual model (Greene, 2017; Wooldridge, 2019).

Our estimates confirm that worker indebtedness negatively influences strike volume, strike participation and strike duration in the EU countries. Our results also show that this negative influence is stronger in the EU countries with the highest levels of worker indebtedness. Our estimates also corroborate that the rise in worker indebtedness has even been one of the main drivers behind the decline in strike activity in the EU countries since the mid-1990s.

The remainder of this paper is organised as follows. In Section 2, we provide theoretical and empirical literature on strike activity in the era of financialisation. Section 3 presents the conceptual model and the corresponding hypotheses. The dataset and the econometric method are described in Section 4 and Section 5, respectively. Section 6 displays the results and the corresponding discussion. Finally, Section 7 provides conclusions.

2. THEORETICAL AND EMPIRICAL LITERATURE ON STRIKE ACTIVITY IN THE ERA OF FINANCIALISATION

It is widely acknowledged that the majority of countries all over the world have in the last five decades been employing the ideas promoted by Reagonomics and Thatcherism, which has occurred simultaneously with a strong process of liberalisation, deregulation and privatisation of the financial system (Barradas, 2020, 2022a). As a consequence, the financial system has displayed strong growth and a general increasing dominance over the real economic and everyday life of workers (Van der Zwan, 2014), a phenomenon that is typically invoked as financialisation, which is visible through the higher and stronger involvement of workers, including those with low income and low wealth, in the realm of the financial system (Lapavitsas, 2011; Van der Zwan, 2014; Gonçalves and Barradas, 2021). Workers are more engaged with the financial system because they are now holding more financial assets (e.g., deposits, bonds, stocks, employee stock options, life insurance pensions, other insurance products, money market funds, cryptoassets and financial derivatives) and are now obtaining more financial liabilities (e.g., mortgage credits, car loans, consumer credits, credit cards, overdraft bank charges and student loans).

As a result, worker indebtedness has evidenced a steep increase in the last five decades to unprecedented and unsustainable levels, even reaching historical maximum levels, particularly up to the Great Recession (Barradas and Tomás, 2023; Romão and Barradas, 2024). Stockhammer (2009), Hein (2012), Moore and Stockhammer (2018), Barradas (2022b) and Bezemer et al. (2023) have pointed out that the main factors that have contributed to the sustainment of the

growth of worker indebtedness in the last decades are the greater availability of credit supported by financial innovation (e.g., debt securitisation and the 'originate to distribute' strategies of financial institutions), technological progress (e.g., credit scoring models), a general decreasing trend in interest rates, a strong competition among financial institutions and the resultant adoption of more aggressive credit policies, and the appearance of new financial instruments (e.g., home equity loans and credit cards) that imply a deterioration of creditworthiness standards and a reduction in collateral requirements, even for low-income and low-wealth workers.

From an empirical point of view, we also find in the literature several econometric works that aim to assess the causes behind the rise of worker indebtedness in developed countries in the last five decades, such as Oikarinen (2009), Gimeno and Martinez-Carrascal (2010), Anundsen and Jansen (2013), Meng et al. (2013), Rubaszek and Serwa (2014), Klein (2015), Malinen (2016), Moore and Stockhammer (2018), Stockhammer and Wildauer (2018), Barradas and Tomás (2023) and Romão and Barradas (2024).

Nonetheless, the theoretical and empirical literature around the consequences of the high level of worker indebtedness remains underexplored, particularly with regard to the corresponding impact on labour relations. Our argument ascertains that indebted workers are in a more financially fragile position, which then reveals a more self-disciplined attitude and risk-averse behaviour in the workplace that inhibits demands for higher wages and better labour conditions by lessening worker involvement in labour conflicts, labour unrest, protests, picketing, lockouts, stoppages and/or strikes. This is the so-called 'labour quiescence' (Shalev, 1992). Effectively, indebted workers tend to exhibit higher resignation and conformism and lesser claimant behaviour, even with stagnant (or falling) wages and worsening labour conditions, in order to retain their jobs (and income) and to honour their financial obligations, thereby promoting a strong decline in strike activity in the last five decades (Godard, 2011; Kelly, 2015; Gouzoulis, 2023; Barradas, 2024a) This results from at least four different channels.

The first channel states that indebted workers are involved in fewer strikes due to the fear of losing their jobs (and income) and the consequent risks of default (Langley, 2007; Stockhammer, 2009; Lazzarato, 2012; Sweet, 2018). The second channel postulates that indebted workers participate in fewer strikes because they tend to preserve their jobs and a steady flow of income until they repay their existing debts and, thus, avoid a potential default (Gouzoulis, 2023). The third channel emphasises that indebted workers engage in fewer strikes in order to self-protect from the social stigma that would potentially arise in the cases in which there is a personal default because this is typically associated with a personal failure by showing a certain incompetence to successfully manage their own finances (Wood, 2017). The fourth channel stresses that indebted workers join in fewer strikes in order to avoid a loss of income in the short term, even in cases in which trade unions would provide some strike pay due to the existence of a time lag between the day of the strike and the day of receipt of that reimbursement, as well as the high risk of being permanently replaced and/or dismissed in the medium and long term (Stelzner, 2017; Gourevitch, 2018; Grady and Simms, 2019; Gouzoulis, 2023).

As a consequence, indebted workers, by decreasing their strike activity, have not properly contested the neoliberal agenda and the concomitant deregulation and flexibilisation of labour relations, indeliberately agreeing with the strong deterioration of labour relations, the loss of some labour rights and the rise of labour exploitation that has been observable in the last five decades all over the world (Feres et al,, 2024). This seems to suggest that worker indebtedness cannot be dissociated from the drop in the labour income share and the resultant stagnant (or falling) wages

(Stockhammer, 2017; Barradas, 2019; Alcobia and Barradas, 2023); the rise of top management compensation vis-à-vis the working class and blue-collar workers and the consequent widening of personal income inequalities (Barradas and Lakhani, 2024; Barradas, 2024b); the proliferation of atypical work (e.g., temporary or fixed-term contracts, dispatched contracts, involuntary part-time jobs, internships and multiple job holding) and the corresponding prevalence of nonstandard labour contracts (Kalleberg, 2000, 2009; Chan, 2023; Gouzoulis et al., 2023a; Feres et al., 2024); 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 in the workplace (e.g., discrimination, bullying, harassment and violence) (Buttigieg et al., 2011); the deterioration in work–life balance and the intensification of work pressure (Ayudhya et al., 2019); and the spread of informal work and non-contract workers (Chan, 2023).

The theoretical and empirical literature has already evidenced that worker indebtedness has been definitively contributing to the decline in the labour income share (Wood, 2017; Kohler et al., 2019; Gouzoulis, 2021, 2022; Gouzoulis et al., 2023b), the fall of organised labour and the consequent decrease in the unionisation rate (Gouzoulis, 2024), the rise in atypical work and the resultant proliferation of non-standard labour contracts (Gouzoulis et al., 2023a), and the reduction in strike activity (Gouzoulis, 2023; Barradas, 2024a).

Empirically, the studies of Gouzoulis (2023) and Barradas (2024a) are examples of two econometric works that aim to address the relationship between worker indebtedness and strike activity. The former employed a time series econometric analysis focused on Japan, Korea, Norway, Sweden, the United Kingdom and the Unites States and concluded that worker indebtedness has exerted a negative effect on strike activity in these countries in the last five decades, but especially in the cases of Japan, Korea, Sweden, the United Kingdom and the United States. A time series econometric analysis was also performed in the latter study, which was centred on Portugal and concluded that worker indebtedness has been one of the main drivers behind the decline of strike activity in Portugal in the last four decades.

To the best of our knowledge, this paper is the first one that aims to assess the relationship between worker indebtedness and strike activity by performing a panel data econometric analysis for the EU countries over the period from 1995 to 2022, which will contribute to obtain more generalisable results and more consistent and more efficient estimates.

3. CONCEPTUAL MODEL AND HYPOTHESES

Our conceptual model is based on an equation to assess the determinants of strike activity in the EU countries, and it takes the following form:

$$SA_{i,t} = \beta_0 + \beta_1 WI_{i,t} + \beta_2 X_{i,t} + \alpha_i + \varepsilon_t \quad (1)$$

where i is the country, t is time period (years), SA corresponds to the strike activity, WI relates to worker indebtedness, X is a set of control variables and α and ε are the two-way error term

components to account for unobservable time-specific effects and country-specific effects, respectively.

Our control variables were chosen to take into account the traditional explanations identified in the literature for the decline in strike activity in the last five decades, namely the deceleration of economic activity (Kaufman, 1982; Tracy, 1986; McConnell, 1990; Goerke and Madsen, 2004), the disinflationary process (Gouzoulis, 2023), deindustrialisation and the accompanying reduction in industrial work (Bell, 1973; Troy, 1990), the retrenchment of the welfare states and the consistent decrease in public servants and public work (Piazza, 2005; Gouzoulis, 2023; Romão and Barradas, 2024), globalisation and the corresponding increase in trade openness (Piazza, 2005; Brandl and Traxler, 2010; Tuman, 2019) and the decrease in unionisation rates and the resultant deterioration in general workers' bargaining power (Gouzoulis, 2023; Kaufman, 1982, 1983). Thus, our control variables encompassed macroeconomic performance, the inflation rate, industrial work, public work, the degree of globalisation and the unionisation rate, which were also used to avoid the problem of omitted relevant variables and to obtain more consistent and more efficient estimates (Brooks, 2009).

Accordingly, our conceptual model and the respective equation to assess the determinants of strike activity in the EU countries takes the following form:

$$SA_{i,t} = \beta_0 + \beta_1 WI_{i,t} + \beta_2 MP_{i,t} + \beta_3 IR_{i,t} + \beta_4 IW_{i,t} + \beta_5 PW_{i,t} + \beta_6 DG_{i,t} + \beta_7 UR_{i,t} + \alpha_i + \varepsilon_t \quad (2)$$

where i is the country, t is time period (years), SA corresponds to strike activity, WI relates to worker indebtedness, MP is macroeconomic performance, IR is the inflation rate, IW is industrial work, PW is public work, DG is the degree of globalisation, UR is the unionisation rate and α and ε are the two-way error term components to account for unobservable time-specific effects and country-specific effects, respectively.

Our conceptual model follows a macroeconomic approach that implicitly takes the assumption of the existence of a representative worker in the EU countries whose behaviour does not change across time and space. This macroeconomic approach introduces at least two important shortcomings in our empirical work (Correia and Barradas, 2021; Barradas, 2023). First, we cannot address whether the determinants of strike activity in the EU countries vary according to the workers' own characteristics (e.g., age, sex, qualifications, occupation, type of labour contract, household size and social stratum). Second, we cannot address whether the determinants of strike activity in the EU countries vary according to the corporations, sectors, industries, regions and/or countries in which workers' jobs are located. Nevertheless, this macroeconomic approach entails at least four distinct advantages that potentially compensate for the two shortcomings (Correia and Barradas, 2021; Barradas, 2023; Gouzoulis, 2023). The first advantage is associated with the possibility of addressing the determinants of strike activity in the EU countries as a whole by looking beyond the idiosyncrasies of each worker in each corporation, sector, industry, region or country. Against this backdrop, if worker indebtedness (or any other independent variable) has a statistically significant influence on strike activity in the EU countries, we cannot ensure whether that influence occurs only with some workers or in some corporations, sectors, industries, regions and countries or indifferently affects all workers, corporations, sectors, industries, regions and countries. If worker indebtedness (or any other independent variable) does not have a statistically

significant influence on strike activity in the EU countries, we cannot ascertain whether there is an influence for some workers or in some corporations, sectors, industries, regions and countries, albeit at an insufficient level to generate a global influence on all workers, corporations, sectors, industries, regions and countries in the EU. The second advantage is linked with the analysis of the determinants of strike activity in the EU countries covering the longest period possible, which paves the ground for microeconomic approaches at the worker level, corporate level, sector level, industry level, regional level and country level. The third advantage is related to the analysis of the determinants of strike activity in the EU countries, which takes into account that the majority of them will implicitly have the predicted microeconomic influences. The fourth advantage is connected to the analysis of the determinants of strike activity in the EU countries, which relies on some stylised facts and economic and social transformations (e.g., the deindustrialisation and the resultant reduction of industrial work, the retrenchment of the welfare states and the corresponding decrease in public servants and public work, and/or the globalisation and the consequent increase in trade openness) that cannot be taken into account by performing a microeconomic approach at the worker level, corporate level, sector level, industry level, regional level and country level.

We hypothesised that worker indebtedness and the degree of globalisation should exert a negative effect on strike activity, whilst macroeconomic performance, the inflation rate, industrial work, public work and the unionisation rate should exert a positive effect on strike activity. Therefore, our long-term estimated coefficients should exhibit the following signs:

$$\beta_1 < 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 > 0, \beta_6 < 0, \beta_7 > 0 \quad (3)$$

As previously discussed, it was expected that worker indebtedness would negatively impact strike activity due to the workers' highly fragile financial positions and their disciplined attitudes and risk-averse behaviour in the workplace that limit their demands for higher wages and better labour conditions due to the risk of losing their jobs (and income) and being unable to honour their financial obligations (Langley, 2007; Stockhammer, 2009; Lazzarato, 2012; Stelzner, 2017; Wood, 2017; Gourevitch, 2018; Sweet, 2018; Grady and Simms, 2019; Gouzoulis, 2023; Barradas, 2024a).

Strike activity should be positively affected by macroeconomic performance because of its procyclical behaviour (Kaufman, 1982; Tracy, 1986; McConnell, 1990; Harrison and Stewart, 1994; Goerke and Madsen, 2004). During economic expansions, the unemployment rate tends to decline, which induces workers to become involved in strikes to demand higher wages to maintain their purchasing power due to the corresponding increase in inflationary pressures.

The inflation rate should also exert a positive influence on strike activity, primarily because a rising inflation rate encourages workers to engage in strikes to demand higher wages in order to not lose their purchasing power (Gouzoulis, 2023).

Strike activity should also positively depend on industrial work and public work, particularly due to the fact that workers in the manufacturing industries and workers in the public sector tend to be more strike prone vis-à-vis workers in the nonmanufacturing industries and workers in the private sector and those that are unemployed, respectively (Bell, 1973; Troy, 1990; Gouzoulis,

2023). The stronger militant stance presented by workers in the manufacturing industries and workers in the public sector exists because these workers have closer ties with the trade unions and have more typical labour contracts vis-à-vis workers in the nonmanufacturing industries and workers in the private sector who tend to be less unionised, to have more atypical labour contracts and to more often be self-employed (Gouzoulis, 2023).

It was expected that the degree of globalisation would negatively impact strike activity because multinational, transnational and the so-called 'nomadic' corporations threaten to offshore and/or relocate production to low-wage countries, which discourages workers from participating in strikes in order to preserve their jobs (and income) despite a deterioration in their labour conditions (Zamagni, 2003; Piazza, 2005; Brandl and Traxler, 2010; Hein, 2012; Tuman, 2019).

Finally, the unionisation rate should also exert a positive effect on strike activity due to a higher capacity for workers' organisation and workers' mobilisation and the resultant increase in workers' bargaining power (Kaufman, 1982, 1983; Gouzoulis, 2023) because the right to call a strike is primarily reserved for trade unions in several EU countries (e.g., Croatia, Cyprus, Czechia, France, Greece, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania and Slovakia).

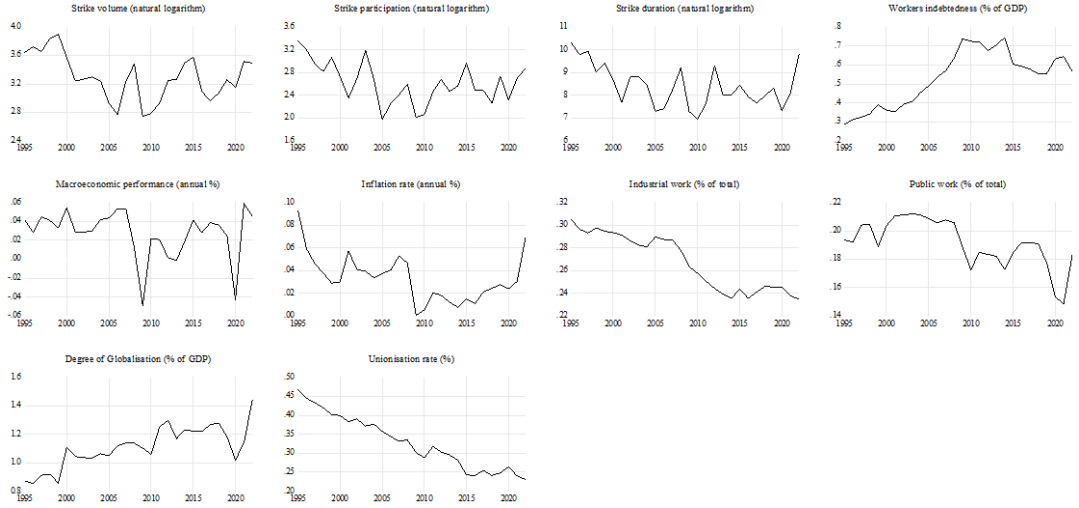
4. DATASET

Our dataset was composed of annual data for all EU countries from 1995 to 2022, which constituted a panel dataset with a total of 26 cross-sectional units (countries) observed over 28 years2. This represents the period and periodicity for which all data were available. Indeed, the proxy to measure public work was only available from 1995 onwards, most of the proxies to assess our variables (including the ones chosen to proxy strike activity) were only available on a yearly basis and the majority of these were not yet available for 2023. All data were collected in October 2024.

Our dataset was appropriate to produce our estimates for three reasons. First, we used a relatively large sample by covering at least three different decades, which allowed us to examine the long-term trends and structural adjustments behind the evolution of strike activity in the EU countries. Second, we used a relatively large sample by encompassing some heterogeneity regarding worker indebtedness, namely periods of acceleration and periods of deceleration of worker indebtedness (Figure 1). Third, we used a relatively large sample by covering the period in which worker indebtedness had more preponderance in the EU countries (Figure 1).

[2] Croatia was not included in our panel data set due to the unavailability of data, particularly with regard to strike activity. Croatia is one of a small group of countries in the EU that does not maintain a national statistical account of strikes (Dribbusch and Vandaele, 2016).

Figure 1 – Plots of our variables (unweighted averages for the EU countries)



Our dataset was structured in an unbalanced panel because not all variables were available for all countries in all years of our sample, especially the ones related to strike activity. As argued by Dribbusch and Vandaele (2016), there are considerable gaps in the data related to strike activity in the EU because there are countries that do not collect such data at all or at least not on a regular basis and there are countries that only release such data with an extensive delay. Our unbalanced panel was composed of 441 observations, with 287 missing. Table 1 displays the structure and composition of our unbalanced panel.

Table 1 – The structure and composition of our unbalanced panel

Country	Period	Observations	Missing
Austria	1995-2002, 2005-2010 and 2015-2017	17	11
Belgium	1995-2000	6	22
Bulgaria	2010-2020	11	17
Cyprus	1995-2018 and 2022	25	3
Czechia	1995-1996 and 2009-2012	6	22
Denmark	1995-2021	27	1
Estonia	1995-2001, 2003, 2005-2009, 2011 and 2013-2018	20	8
Finland	1995-2008, 2011-2020 and 2022	25	3
France	1995-2004	10	18

Germany	2009-2022	14	14
Greece	1995-1998	4	24
Hungary	1995-2007, 2012, 2016-2019 and 2022	19	9
Ireland	2002-2018 and 2022	18	10
Italy	1995-2008	14	14
Latvia	2005-2013 and 2015-2021	16	12
Lithuania	2000-2008, 2012 and 2015-2019	15	13
Luxembourg	2000-2004	5	23
Malta	1995-1998, 2000-2009 and 2011-2012	16	12
Netherlands	1995-2022	28	0
Poland	1995-2013, 2015, 2018 and 2020-2022	24	4
Portugal	1995-2022	28	0
Romania	2001-2008	8	20
Slovakia	1995, 1997-2010, 2013-2015 and 2017-2022	24	4
Slovenia	2000-2007	8	20
Spain	1995-2022	28	0
Sweden	1995-2013 and 2017-2022	25	3

We used three different proxies to measure strike activity because of its many-sided nature, including strike volume (i.e., the number of strikes per year), strike participation (i.e., the number of workers involved in strikes per year) and strike duration (i.e., the number of working days not worked per year as a result of strikes). The use of these three different proxies also allowed us to assess the robustness of our estimates according to the proxy chosen to measure strike activity. Each of these three different proxies represented one of the three dependent variables of our conceptual model, which was estimated separately.

Table 2 synthetises the definitions, units and sources for all variables, Table 3 provides the descriptive statistics for each variable and Table 4 contains the correlations between all of the variables.

Table 2 – Variables, proxies, units and sources for all variables[3]

Variable	Proxy and Unit	Source
Strike Volume	Strikes per year (natural logarithm)	ILO and European Trade Union Institute
Strike Participation	Workers involved in strikes per year (natural logarithm)	ILO and European Trade Union Institute
Strike Duration	Working days not worked due to strikes (natural logarithm)	ILO and European Trade Union Institute
Worker Indebtedness	Household debt, loans and debt securities (% of GDP)	IMF
Macroeconomic Performance	GDP growth (annual %)	World Bank
Inflation Rate	Inflation, GDP deflator (annual %)	World Bank
Industrial Work	Employment in industry (% of total)	World Bank
Public Work	Compensation of employees (% of total public expenses)	World Bank
Degree of Globalisation	Trade (% of GDP)	World Bank
Unionisation Rate	Trade union density (%)	OECD/AIAS ICTWSS and Barradas (2019)

Table 3 – The descriptive statistics for each variable

Variable	Mean	Median	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis
Strike Volume	3.295	2.944	9.455	0.000	2.289	0.193	1.937
Strike Participation	2.622	2.526	8.602	0.000	2.056	0.451	2.407

[3] Data for the variables of strike volume, strike participation and strike duration for Bulgaria, Luxembourg and Slovenia were collected from the database provided by the European Trade Union Institute due to their unavailability on the ILO database. As the variables of strike volume, strike participation and strike duration were measured by applying the natural logarithms, we had previously added a constant of one in all of the natural logarithms because for some countries in some years there was no occurrence of any strikes. Given the absence of a database with data available on public servants, we used the compensation of employees (i.e., all payments in cash and in kind [such as food and housing[in return for services rendered as well as government contributions to social insurance schemes that provide benefits to employees, including social security and pensions) as a percentage of the total public expenses to measure public work (Kollmeyer and Peters, 2019).

Strike Duration	8.433	9.863	15.414	0.000	4.514	-0.800	2.423
Worker Indebtedness	0.516	0.445	1.379	0.010	0.335	0.581	2.459
Macroeconomic Performance	0.029	0.029	0.245	-0.146	0.035	-0.049	9.815
Inflation Rate	0.035	0.022	0.380	-0.097	0.046	2.333	18.333
Industrial Work	0.271	0.272	0.423	0.139	0.058	0.098	2.402
Public Work	0.194	0.190	0.456	0.062	0.091	0.673	2.685
Degree of Globalisation	1.098	1.012	3.227	0.371	0.507	1.323	5.177
Unionisation Rate	0.338	0.251	0.848	0.045	0.225	0.722	2.114

Table 4 – The correlations between all the variables

Variable	SV	SP	SD	WI	MP	IR	IW	PW	DG	UR
SV	1.000									
SP	0.805***	1.000								
SD	0.826***	0.826***	1.000							
WI	0.283***	0.174***	0.318***	1.000						
MP	-0.163***	-0.140***	-0.108**	-0.314***	1.000					
IR	-0.182***	-0.095**	-0.094**	-0.404***	0.280***	1.000				

IW	-0.222***	-0.146***	-0.339***	-0.718***	0.169***	0.301***	1.000			
PW	-0.186***	-0.212***	-0.155***	-0.134***	0.152***	0.086*	0.169***	1.000		
DG	-0.496***	-0.458***	-0.395***	0.036	0.172***	-0.092*	-0.054	0.302***	1.000	
UR	0.101**	-0.009	0.172***	0.278***	-8.59e-6	-0.073	-0.255***	-0.106**	-0.037	1.000

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

All correlations between our variables are less than 0.8 in absolute terms, which confirms the inexistence of multicollinearity among them (Studenmund, 2016). The only exceptions occurred with the three variables related to strike activity, but they will not be used simultaneously in the same model.

It is worth noting that strike activity in the EU countries registered a relative reduction, particularly up to the Great Recession, that corresponds to the period in which worker indebtedness exhibited the highest growth (Figure 1). This seems to confirm our argument of the existence of a negative relationship between worker indebtedness and strike activity due to their self-disciplined attitudes and risk-averse behaviour in the workplace that restrain their demands for higher wages and better labour conditions. The slight positive correlation between worker indebtedness and strike volume (or strike participation or strike duration) seems to support these claims (Table 4).

Table 5 – P-values of the Karavias and Tzavalis (2014) panel unit root test for each variable

Variable	Levels	First Differences
Strike Volume	0.000 (2007 and 2009)	n.a.
Strike Participation	0.000 (2019 and 2020)	n.a.
Strike Duration	0.000 (2020 and 2021)	n.a.
Worker Indebtedness	0.000 (2020 and 2021)	n.a.
Macroeconomic Performance	0.000 (1996 and 2021)	n.a.

Inflation Rate	0.000 (1996 and 1997)	n.a.
Industrial Work	0.000 (2000 and 2001)	n.a.
Public Work	1.000 (2001 and 2002)	0.000 (2019 and 2020)
Degree of Globalisation	1.000 (2009 and 2021)	0.000 (1996 and 2020)
Unionisation Rate	0.000 (2000 and 2001)	n.a.

Note: Estimated break dates are reported in ()

Table 5 includes the recent Karavias and Tzavalis (2014) panel unit root test for each variable, which was carried out in the Stata software by relying on the 'xtbunitroot' command developed by Chen et al. (2022). This panel unit root test possesses some unique optimality properties in comparison with other panel unit root tests because it allows for one or two known or unknown structural breaks, non-normal errors, cross-sectional heteroskedasticity, cross-sectional dependence, homogeneity or heterogeneity among the different cross-sectional units, and it can be used in panel datasets with small or large time-series dimensions and in both balanced and unbalanced panels (Karavias and Tzavalis, 2014). Results of this panel unit root test confirmed that we had a mixture of variables that are integrated of order zero (i.e., variables that are stationary in levels) and variables that are integrated of order one (i.e., variables that are stationary in the first differences). Strike volume, strike participation, strike duration, worker indebtedness, macroeconomic performance, inflation rate, industrial work and unionisation rate are stationary in levels, whilst public work and the degree of globalisation are stationary only in the first differences.

5. ECONOMETRIC METHOD

Our econometric method encompassed the implementation of the FE2SLS estimator for three different reasons. The first reason was the need to overcome the potential problems of endogeneity because the traditional panel data estimators (e.g., pooled ordinary least squares, fixed effects and random effects) produce inconsistent and biased estimates in the presence of endogeneity (Greene, 2017; Wooldridge, 2019). Note that we cannot completely discard problems of endogeneity in our conceptual model due to the possible existence of simultaneity (and/or reverse causation) between our variables, the hypothetical existence of measurement errors in the proxies chosen for our variables and the potential omission of other important determinants of strike activity in the EU countries. The second reason was the possibility of dealing with unobservable heterogeneity across our cross-sectional units that were observed over time, that is, country-specific effects and time-specific effects (Greene, 2017). The third reason was related to the reliable estimates produced by the FE2SLS estimator in terms of consistency and efficiency, even in the presence of endogeneity (Wooldridge, 2019).

In order to perform the FE2SLS, we needed to define a set of instruments (i.e., the so-called instrumental variables) that should be at least equal to the number of independent variables

in our conceptual model. Instrumental variables should be variables that are not independent variables in our conceptual model but are strongly correlated with them and are exogenous (orthogonal) in relation to the regression error component (Greene, 2017; Wooldridge, 2019). The traditional strategy that is typically used to choose the instrumental variables is utilisation of the lagged variables. The suitability of our estimates and the validity of our instrumental variables were assessed by applying the Sargan test (or the so-called Hansen test or the so-called J test), which validates the overidentifying restrictions in a certain statistical model (Sargan, 1958, 1975). We used the first lag and the second lag of each variable presented in our conceptual model as our set of instrumental variables. The choice of a relatively small set of instrumental variables allows more efficient estimates to be obtained (Ravenna and Walsh, 2006) and increases the power of the Sargan test (Mavroeidis, 2009).

Our estimates were produced in the EViews software and in the Stata software by relying on the 'xtivreg' and 'xtivreg2' commands. As the FE2SLS requires that all variables should be stationary in levels, we used the first differences of the variables pertaining to the public work and the degree of globalisation because they were integrated of order one. The remaining variables were used directly in levels because they were integrated of order zero. We included time dummies to account for the specific features of each year in the evolution of strike activity in the EU countries and to minimise the possible existence of structural breaks.

As robustness and heterogeneous analyses, we performed a jackknife analysis that re-estimated our conceptual model by excluding one country at a time (Quenouille, 1949, 1956; Tukey, 1958), and we also re-estimated our conceptual model with a focus on only the EU countries with the highest levels of worker indebtedness. This allowed us to assess the robustness of our estimates to resampling, to take advantage of the cross-sectional dimension of our panel dataset and to confirm whether the negative impact of worker indebtedness on strike activity is stronger for more indebted workers.

Finally, we assessed the economic effects of our statistically significant estimates to better identify the drivers of strike activity in the EU countries from 1995 to 2022 (McCloskey and Ziliak, 1996; Ziliak and McCloskey, 2004).

6. RESULTS AND DISCUSSION

Our estimates are presented and discussed throughout this Section. Table 6 exhibits the estimates of strike activity for the EU countries. These estimates were produced by relying on three different models in a context in which each one used a different variable to capture the multidimensional nature of strike activity, namely strike volume, strike participation and strike duration. All of these estimates are reliable, and our instrumental variables are strongly accepted because we cannot reject the null hypothesis of the Sargan test that the overidentifying restrictions are valid (Sargan, 1958 and 1975). Given the high values for R-squared and adjusted R-squared, our estimates also describe expressively well the evolution of strike activity in the EU countries since the mid-1990s.

Our estimates are quite robust primarily because they did not radically change in terms of statistical significance and signs of the coefficients when we used different variables as proxies to assess strike activity in the EU countries. In what follows, we interpret our estimates for each independent variable in more detail.

Table 6 – Estimates of strike activity for the EU countries

Variable	Strike Volume	Strike Participation	Strike Duration
	1.584	2.471	7.888*
Constant	(2.121)	(2.551)	(4.572)
	[0.747]	[0.969]	[1.725]
	-1.961*	-2.360*	-4.260*
Worker Indebtednesst	(1.125)	(1.395)	(2.507)
	[-1.743]	[-1.692]	[-1.699]
	-15.662**	-14.386*	-42.216***
Macroeconomic Performancet	(6.986)	[8.816]	(15.574)
	[-2.242]	[-1.632]	[-2.711]
	8.386	5.090	23.797*
Inflation Ratet	(6.460)	(7.653)	(13.757)
	[1.298]	[0.665]	[1.730]
	18.356***	18.321***	28.818**
Industrial Workt	(5.933)	(7.157)	(12.993)
	[3.094]	[2.560]	[2.218]
	-2.807	3.294	7.071
ΔPublic Workt	(7.960)	(9.164)	(17.099)
	[-0.353]	[0.359]	[0.414]
	7.071*	8.711*	6.048
ΔDegree of Globalisationt	(3.667)	(4.494)	(8.238)
	[1.928]	[1.939]	[0.734]
	-4.722*	-8.792***	-10.723*
Unionisation Ratet	(2.608)	(3.131)	(5.620)
	[-1.810]	[-2.808]	[-1.908]
Observations	309	309	309

Years	25	25	25
Countries	26	26	26
Time effects	Yes	Yes	Yes
Sargan test (p-value)	0.101	0.206	0.848
R-squared	0.866	0.767	0.827
Adjusted R-Squared	0.836	0.715	0.788

Note: Standard errors in ( ), t-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level. Coefficients, standard errors and t-statistics for the time dummies are not reported

We report strong evidence that worker indebtedness exerts a negative impact on strike volume, strike participation and strike duration in the EU countries4. This negative relationship confirms our argument that due to a highly fragile financial position, indebted workers display a more self-disciplined attitude and risk-averse behaviour in the workplace in order to retain their jobs (and income) and to honour their financial obligations, which then restricts their demand for higher wages and better labour conditions through their involvement in strikes (Langley, 2007; Stockhammer, 2009; Lazzarato, 2012; Stelzner, 2017; Wood, 2017; Gourevitch, 2018; Sweet, 2018; Grady and Simms, 2019; Gouzoulis, 2023). Our results are in line with those reported by Gouzoulis (2023) for the specific cases of Japan, Korea, Sweden, the United Kingdom and the United States and reported by Barradas (2024a) for Portugal.

We also confirm a negative relationship between macroeconomic performance and strike volume, strike participation and strike duration in the EU countries5. As found by Barradas (2024a), this counterintuitive result does not confirm that strike activity reveals a procyclical behaviour (Kaufman, 1982; Tracy, 1986; McConnell, 1990; Harrison and Stewart, 1994; Goerke and Madsen, 2004). Instead, our estimates show that strike activity exhibits a countercyclical behaviour in the EU countries, which could be related to the countercyclical behaviour of wages and their sluggish nature (Willis and Wroblewski, 2007). Barradas (2024a) also highlighted that the countercyclical behaviour of strike activity derives from the high costs faced by employers in firing and hiring workers and the corresponding existence of a risk-sharing compromise between employers and workers in the EU countries, particularly in the context of an intensification of the degree of globalisation (Figure 1), which implies that employers preserve wages and jobs during economic recessions and workers do not participate in strikes to request higher wages and better labour conditions during economic expansions. This is especially relevant given the change in the paradigm of collective bargaining arrangements that has arisen at both the corporate level and the national level in the last few decades (Hein and Schulten, 2004). The emergence of the so-called

[4] The negative impacts of worker indebtedness on strike volume, strike participation and strike duration, respectively, do not change if we use household debt (all instruments) as a percentage of the gross domestic product instead of household debt (loans and debt securities) as a percentage of the gross domestic product. Results are available upon request.

[5] The negative relationships between macroeconomic performance and strike volume, strike participation and strike duration, respectively, do not change if we use the annual percentage growth rate of the real gross domestic product per capita instead of the annual percentage growth rate of the real gross domestic product. Results are available upon request.

'pacts for employment and competitiveness' at the corporate level has originated concessional bargaining, according to which workers have accepted worsening labour conditions (e.g., wage contractions and/or working time extensions) in exchange for limited job guarantees. The emergence of tripartite social pacts and the corresponding implementation of the so-called 'competitive corporatism' at the national level have promoted wage constraint policies to sustain external competitiveness.

We also find that the inflation rate exerts a positive effect on strike activity in the EU countries, especially in the case of strike duration[6]. This result confirms that high inflation pressures incite workers to engage in longer lasting strikes to make a claim for higher wages to avoid loss of their purchasing power (Gouzoulis, 2023). Gouzoulis (2023) reported a positive relationship between the inflation rate and strike activity in Japan, Sweden, the United Kingdom and the United States.

Another finding relates to industrial work, namely that it has a positive influence on strike volume, strike participation and strike duration in the EU countries. This result was expected and is similar to Gouzoulis' (2023) finding for Japan and Korea and Barradas' (2024a) finding for Portugal, thereby corroborating the theoretical claims that industrial workers have a more strike-prone stance vis-à-vis non-industrial workers and unemployed workers (Bell, 1973; Troy, 1990).

Public work has no effect on strike volume, strike participation or strike duration in the EU countries given the lack of statistical significance of its coefficients in all three models. This result is not too surprising since public work has remained relatively stable in the EU countries in the last few decades (Figure 1).

The degree of globalisation is a positive determinant of strike activity in the EU countries, especially with regard to strike volume and strike participation[7]. This unexpected result fails to confirm the theoretical belief that workers prefer to preserve their jobs (and incomes) instead of engaging in strikes to request higher wages and better labour conditions because they fear that their corporations will offshore and/or relocate to low-wage countries (Zamagni, 2003; Piazza, 2005; Brandl and Traxler, 2010; Hein, 2012; Tuman, 2019). Abouharb and Fordham (2020) suggested that there are at least three different reasons that could explain the positive impact of the degree of globalisation on strike activity in the EU countries. The first reason is concerned with the existence of several EU countries that are export oriented. These countries tend to experience more strike activity due to an increasing demand for labour that strengthens the general workers' bargaining power. The second reason is also related to the existence of several EU countries that are relatively exported oriented and that have a greater union density, which favours more strikes due to market pressures that strengthen the ability of labour to mobilise. The third reason is linked with the uncertainty related to exposure to international markets that alters the bargaining power of labour and capital, which leads to miscalculations by both sides (capitalists and workers) and could boost the number of strikes. A positive relationship between the degree of globalisation and strike volume was also reported by Barradas (2024a) for the Portuguese case.

Unionisation rate tends to have a negative effect on strike volume, strike participation and strike duration in the EU countries. This result is not in accordance with the theoretical predictions that

[6] The positive effect of the inflation rate on strike duration did not change when we used the annual percentage growth rate of consumer price index instead of the annual percentage growth rate of the gross domestic product deflator. Results are available upon request.

[7] The degree of globalisation remains a positive determinant of strike volume as well as strike participation if we use net outflows 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.

higher unionisation rates are directly related to a higher capacity for workers' organisation and workers' mobilisation around the realisation of new strikes (Kaufman, 1982, 1983; Gouzoulis, 2023). This unexpected negative influence of unionisation rate on strike activity could be attributable to the threat effect exerted by stronger unions around the mobilisation of workers to the realisation of new strikes that could be enough to win several disputes with employers even without the materialisation of those strikes (Gouzoulis, 2023). Gouzoulis (2023) found a similar result for Japan, Norway and the United States.

The application of the jackknife analysis (Quenouille, 1949, 1956; Tukey, 1958) confirms the robustness of all of our estimates because all variables do not change expressively in terms of statistical significance and signs of the coefficients in comparison to the estimates for strike volume, strike participation and strike duration for the EU countries (Table 6)8.

Table 7 demonstrates the estimates of strike activity for the EU countries with the highest levels of worker indebtedness (Cyprus, Denmark, Germany, Ireland, the Netherlands, Portugal, Spain and Sweden). The average of worker indebtedness in these countries is higher than the corresponding average of approximately 51.6 per cent for the EU countries (Table 3). The majority of these countries, especially the southern Anglo-Saxon ones, have even experienced credit-financed, consumption-led booms and growth models supported by worker indebtedness (i.e., the so-called 'debt-driven demand growth models'), particularly up to the Great Recession (Stockhammer and Kohler, 2019; Hein et al., 2021). In these countries, worker indebtedness has sustained greater economic growth, which is particularly enhanced by private consumption, property price inflation and large current account deficits instigated by credit flows from northern countries. As pointed out by Barradas and Tomás (2023), worker indebtedness has already overtaken the total national income in Cyprus, Denmark, Ireland, the Netherlands and Portugal, countries that tend to exhibit higher levels of worker indebtedness even in comparison to that observed in the United States.

We can confirm that these estimates are also reliable, and our instrumental variables are valid because the null hypothesis of the Sargan test is never rejected (Sargan, 1958 and 1975). These estimates also explain expressively well the evolution since the mid-1990s of strike activity in the EU countries with the highest levels of worker indebtedness because the R-squared and the adjusted R-squared remain high. Once again, these estimates are robust as they did not radically change in terms of statistical significance and signs of the coefficients when we used different variables as proxies to assess strike activity in these countries.

Table 7 – Estimates of strike activity for the EU countries with the highest levels of worker indebtedness

Variable	Strike Volume	Strike Participation	Strike Duration
Constant	9.113*** (1.744) [5.224]	10.412*** (3.564) [2.922]	18.688*** (4.702) [3.975]

[8] Estimates of the jackknife analysis are available upon request.

	-2.644***	-1.778	-6.192***
Worker Indebtednesst	(0.832)	(1.759)	(2.323)
	[-3.179]	[-1.011]	[-2.666]
	-14.944**	-29.897*	-23.810
Macroeconomic Performancet	(7.534)	(16.009)	(23.717)
	[-1.984]	[-1.867]	[-1.004]
	-22.257	30.663	-29.941
Inflation Ratet	(15.122)	(28.840)	(42.970)
	[-1.472]	[1.063]	[-0.697]
	1.113	-6.024	11.308
Industrial Workt	(5.779)	(11.802)	(15.830)
	[0.193]	[-0.510]	[0.714]
	1.361	-0.697	21.480
ΔPublic Workt	(6.593)	(12.117)	(16.726)
	[0.206]	[-0.057]	[1.284]
	5.504*	0.884	9.178
ΔDegree of Globalisationt	(3.204)	(6.911)	(9.177)
	[1.718]	[0.128]	[1.000]
	-5.602***	-11.004***	-11.493**
Unionisation Ratet	(2.109)	(4.190)	(5.559)
	[-2.656]	[-2.626]	[-2.067]
Observations	164	164	164
Year	25	25	25
Countries	8	8	8
Time effects	Yes	Yes	Yes
Sargan test (p-value)	0.246	0.278	0.571
R-squared	0.917	0.652	0.630
Adjusted R-Squared	0.891	0.546	0.517

Note: Standard errors in ( ), t-statistics in [], Δ is the operator of the first differences, *** indicates statistically significance at 1% level, ** indicates statistically significance at 5% level and * indicates statistically significance at 10% level. Coefficients, standard errors and t-statistics for the time dummies are not reported

Overall, the results for these countries (Table 7) did not dramatically change in comparison to the results for the EU countries (Table 6). Macroeconomic performance and the unionisation rate continue to be statistically significant by exerting a negative impact on strike activity. The degree of globalisation also remains statistically significant as a positive determinant of strike activity, and public work persists as a statistically insignificant variable to explain the behaviour of strike activity. The most important finding pertains to the variable of worker indebtedness, which remains statistically significant by negatively impacting strike activity and, especially, strike volume and strike duration. However, the negative effects of worker indebtedness on strike activity in the EU countries with the highest levels of worker indebtedness are greater than the negative effects of worker indebtedness on strike activity in the EU countries. This seems to suggest that the negative impact of worker indebtedness on strike activity is stronger for more indebted workers who must preserve their jobs (and income) due to the higher financial obligations that leave them in a more financially fragile position, thereby feeding a greater self-disciplined attitude and more risk-averse behaviour in their workplaces that strongly limit their requests for higher wages and better labour conditions (Langley, 2007; Stockhammer, 2009; Lazzarato, 2012; Stelzner, 2017; Wood, 2017; Gourevitch, 2018; Sweet, 2018; Grady and Simms, 2019; Gouzoulis, 2023; Barradas, 2024a).

Table 8 comprises the economic effects of strike activity in the EU countries and Table 9 encompasses the economic effects of strike activity in the EU countries with the highest levels of worker indebtedness, which allow us to assess the main drivers behind the decline in strike activity in these countries since the mid-1990s.

Table 8 – Economic effects of strike activity for the EU countries

Strike Activity	Variable	Estimated Coefficient	Actual Cumulative Change	Economic Effect
Strike Volume	Worker Indebtednesst	-1.961	0.029	-0.057
	Macroeconomic Performancet	-15.662	0.029	-0.454
	Industrial Workt	18.356	-0.009	-0.165
	ΔDegree of Globalisationt	7.071	0.021	0.148
	Unionisation Ratet	-4.722	-0.025	0.118

Strike Participation	Worker Indebtednesst	-2.360	0.029	-0.068
	Macroeconomic Performancet	-14.386	0.029	-0.417
	Industrial Workt	18.321	-0.009	-0.165
	ΔDegree of Globalisationt	8.711	0.021	0.183
	Unionisation Ratet	-8.792	-0.025	0.220
Strike Duration	Worker Indebtednesst	-4.260	0.029	-0.124
	Macroeconomic Performancet	-42.216	0.029	-1.224
	Inflation Ratet	23.797	0.035	0.833
	Industrial Workt	28.818	-0.009	-0.259
	Unionisation Ratet	-10.723	-0.025	0.268

Note: The actual cumulative change corresponds to the average of the annual growth rates of the corresponding variable from 1995 to 2022 and the economic effect is the multiplication of the estimated coefficient by the actual cumulative change

Table 9 – Economic effects of strike activity for the EU countries with the highest levels of worker indebtedness

Strike Activity	Variable	Estimated Coefficient	Actual Cumulative Change	Economic Effect
Strike Volume	Worker Indebtednesst	-2.644	0.012	-0.032
	Macroeconomic Performancet	-14.944	0.024	-0.359
	ΔDegree of Globalisationt	5.504	0.018	0.099
	Unionisation Ratet	-5.602	-0.025	0.140
Strike Participation	Macroeconomic Performancet	-29.897	0.024	-0.718

	Unionisation Ratet	-11.004	-0.025	0.275
Strike Duration	Worker Indebtednesst	-6.192	0.012	-0.074
	Unionisation Ratet	-11.493	-0.025	0.287

Note: The actual cumulative change corresponds to the average of the annual growth rates of the corresponding variable from 1995 to 2022 and the economic effect is the multiplication of the estimated coefficient by the actual cumulative change

With regard to strike volume, we conclude that the main drivers behind the fall in the number of strikes realised per year in the EU countries from 1995 to 2022 were the acceleration of economic activity, the reduction in industrial work and the rise in worker indebtedness. During that time, the acceleration in economic activity of around 2.9 per cent on average per year, the reduction in industrial work of around 0.9 per cent on average per year and the rise in worker indebtedness of around 2.9 per cent on average per year favoured a decline in strike volume in the EU countries of about 45.4 per cent, 16.5 per cent and 5.7 per cent on average per year, respectively. The acceleration of macroeconomic performance and the rise of worker indebtedness also represented the main drivers behind the decline of strike volume in the EU countries with the highest levels of worker indebtedness.

In relation to strike participation, we observe that the main causes behind the decrease in the number of workers involved in strikes per year in the EU countries from 1995 to 2022 were the acceleration of economic activity, the reduction in industrial work and the rise in worker indebtedness. During that time, strike participation in the EU countries would have effectively been higher by around 41.7 per cent, 16.5 per cent and 6.8 per cent on average per year if there had not been an acceleration of economic activity, a reduction in industrial work and a rise in worker indebtedness, respectively. The acceleration of macroeconomic performance also represented the main cause behind the drop in strike volume in the EU countries with the highest levels of worker indebtedness.

Concerning strike duration, we confirm that the main triggers behind the drop in the number of working days not worked due to strikes per year in the EU countries from 1995 to 2022 were the acceleration of economic activity, the reduction in industrial work and the rise in worker indebtedness. In fact, strike duration in the EU countries would have been higher by about 122.4 per cent, 25.9 per cent and 12.4 per cent on average per year if there had not been an acceleration of economic activity, a reduction in industrial work and a rise in worker indebtedness, respectively. The growth of worker indebtedness also represented the main trigger behind the decrease in strike duration in the EU countries with the highest levels of worker indebtedness.

To summarise, we find that worker indebtedness negatively affects strike volume, strike participation and strike duration in the EU countries. We also find that this negative effect is stronger in the EU countries with the highest levels of worker indebtedness. The rise in worker indebtedness is even one of the main reasons for the fall in strike activity in the EU countries since the mid-1990s.

7. CONCLUSION

This study analysed the role played by the growth of worker indebtedness on the fall of strike activity by performing a panel data econometric analysis from 1995 to 2022 that was focused on EU countries.

During that time, but particularly up to the Great Recession, worker indebtedness denoted a strong increase and strike activity a considerable reduction in the EU countries. These two stylized facts have fed the belief that the reduction in strike activity in the EU countries could be attributable to the registered growth in worker indebtedness because worker financial obligations have placed them in a more financially fragile position that sustains a greater self-disciplined attitude and risk-averse behaviour in their workplaces and constrains their claims for higher wages and better labour conditions in order to preserve their jobs (and income) and to avoid a potential default (Langley, 2007; Stockhammer, 2009; Lazzarato, 2012; Stelzner, 2017; Wood, 2017; Gourevitch, 2018; Sweet, 2018; Grady and Simms, 2019; Gouzoulis, 2023; Barradas, 2024).

Our conceptual model follows a macroeconomic approach according to which strike volume, strike participation and strike duration depend on worker indebtedness and other control variables that encompass the traditional determinants of strike activity identified in the literature (macroeconomic performance, inflation rate, industrial work, public work, degree of globalisation and unionisation rate) and allow problems related to omitted relevant variables to be avoided so that more consistent and more efficient estimates can be obtained (Brooks, 2009). Estimates were produced by employing the FE2SLS estimator to account for the heterogeneity across EU countries and to overcome the potential problems of endogeneity in our conceptual model (Greene, 2017; Wooldridge, 2019).

Our estimates support our argument by evidencing that worker indebtedness negatively influences strike volume, strike participation and strike duration in EU countries. Our estimates also show that this negative influence is stronger in the EU countries with the highest levels of worker indebtedness. Our estimates confirm that the growth of worker indebtedness has even been one of the main drivers behind the decline of strike activity in the EU countries since the mid-1990s. The acceleration of economic activity and the reduction of industrial work have also exacerbated the generally decreasing trend in strike volume, strike participation and strike duration in the EU countries since the mid-1990s.

Our estimates suggest that the deleverage process that has been ongoing since the Great Recession in EU countries (Figure 1) should continue in the coming years to ensure that workers regain their claimant behaviour of engaging in more strikes to promote their economic and social interests, namely a higher level of wages and better labour conditions. Against this backdrop, public policies should continue to promote the progressive reduction of worker indebtedness, which should involve restraining the increase in both housing and financial asset prices and the fall in wages because they have represented the main determinants of worker indebtedness in EU countries since the mid-1990s (Barradas and Tomás, 2023). This should be done, for instance, through an increase in public housing, the introduction of rental controls, an increase in taxes on capital gains and financial transactions and the re-regulation and de-flexibilisation of labour relations (Alcobia and Barradas, 2024).

Further research on this topic should focus on an analysis of the direct and/or indirect consequences related to the decline of strike activity in the EU countries mainly at the level of

social welfare and the potential effects on social tensions, political instability, the emergence of populisms and the general quality of democracies.

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