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Working conditions and sustainable work

Beyond the Great Recession: Employment precariousness dynamics and vulnerabilities across EU labour markets

Employment and working conditions of the most vulnerable workers: Addressing an ongoing policy challenge

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Contents

Abstract

This research presents a comparative analysis of the evolution of precariousness and its main determinants across the EU-27 countries. It contributes to a deeper understanding of trends in employment and working conditions among the most vulnerable segments of the European labour markets. The analysis draws on data from the European Union Labour Force Survey for the period 2009-2021. The estimation of the Adjusted Multidimensional Precariousness Index reveals two general patterns in the evolution of precarious employment across EU countries: while precariousness increased following the Great Recession due to the expansion of involuntary non-standard employment and the intensity of precariousness, a declining trend has been observed since 2016. This later decrease is largely explained by a lower contribution of employment insecurity to overall precariousness (i.e., due to declines in involuntary temporary, involuntary part-time and marginal part-time employment). Nonetheless, precariousness varies considerably across different socio-demographic profiles. Our findings indicate that precariousness has a transitory component, since it tends to affect more young people than adults. In addition, women, those with lower educational attainment, less labour market experience and foreign-born employees exhibit a higher likelihood of holding a precarious job and face more precarious working conditions. Notably, precariousness also differs across occupational groups and economic sectors, being more prevalent in low-skilled occupations and in service sectors where firms require greater organisational flexibility.

Keywords: Adjusted Multidimensional Precariousness Index, employment and working conditions, Europe, precariousness, vulnerable workers.

1. Introduction

The objective of this research is to analyse the incidence and intensity of precariousness through the estimation of a novel indicator across different population groups, sectors and occupations in the EU-27 countries. The prevalence and persistence of precarious employment have become increasingly important in Europe due to the expansion of flexible practices (Gutiérrez-Barbarrusa, 2016). In the aftermath of the Global Financial Crisis, many countries rolled back employment protection legislation for both permanent and temporary employees and reduced unemployment benefits while increased public expending on the activation of the unemployed. The aim of these policies was to provide employers greater flexibility while aiming to integrate more people into the labour market (Viebrock and Clasen, 2009; Heyes, 2011; Rubery, 2011). As a consequence, there has been a general trend toward the retrenchment of employment protection legislation (EPL) across Europe (Barbieri and Cutuli, 2016), along with an increase in non-standard employment (ILO, 2016).

Within this framework, a broad debate has emerged regarding whether non-standard forms of employment may act as ‘steeping stones’ or ‘dead-ends’ on individuals’ subsequent labour

market careers. While there is evidence for both hypotheses, recent studies reveal that there is great heterogeneity within non-standard forms of employment. Research on involuntary part-time employment, marginal part-time jobs as well as temporary work agency jobs, involuntary temporary employment and casual/seasonal jobs provides evidence in favour the dead-end hypothesis (Broughton et al., 2016; Filomena and Picchio, 2022; Kauhanen and Nätti, 2015). In contrast, the stepping stone effect is more likely to emerge among temporary work when researchers account for selection bias, that is, the fact that individuals are not randomly assigned to temporary jobs (Filomena and Picchio, 2022). This suggests that certain non-standard or precarious jobs could contribute towards the integration of workers into the labour market. Lastly, the economic, labour market, and institutional context has been shown to play an important mediating role since the dead-end effect prevails when, for example, the unemployment rate is higher as well as when labour protections are lower (Filomena and Picchio, 2022).

Kalleberg (2012) emphasises that precarious employment is not merely a temporary feature of the economic cycle but reflects structural transformations in advanced economies, with non-standard jobs no longer being a marginal component of labour markets. In this context, the Organisation for Economic Co-operation and Development (OECD) has focused on the quality of jobs (OECD, 2015, 2018), stressing the importance of the study of precariousness and its impact on the individual welfare. OECD's key message is that flexibility-enhancing policies are necessary for economic growth but not sufficient to deliver simultaneously job quality and inclusiveness. For example, labour market reforms that liberalise the use of temporary contracts, but maintain high levels of protection for open-ended jobs, can result in an excessive use of temporary contracts and a lower overall job quality (OECD, 2018).

Precarious employment is a crucial issue, with significant economic, social, and policy implications, primarily due to its uneven distribution across specific population groups, such as young workers, women and migrants, among others (Fudge & Owens, 2006; Murillo-Huertas et al., 2023; Orfao et al., 2021; Pradella & Cillo, 2015). The growing interest in studying precariousness stems from its negative effects on individuals' well-being, as well as their physical and mental health (Benach et al., 2014; Vanroelen et al., 2021). Existing policy research widely acknowledges the risks associated with precarious jobs and has underlined the importance of improving job quality, particularly among non-standard forms of employment (Eurofound, 2018a).

From a European perspective, the incidence of precariousness varies considerably across countries, with Southern and Nordic European countries often exhibiting higher rates of precariousness than their Continental, Anglo-Saxon, Central and Eastern European counterparts, both among the overall workforce (Kretsos & Livanos, 2016) and young workers (Orfao et al., 2021). Kretsos & Livanos (2016) highlight that these country variations suggest that precariousness cannot be examined in isolation from national contexts. These authors defend that economic uncertainty, high levels of unemployment, low spending on active labour market policies and weak trade unions may trigger the risk of precariousness. Nevertheless, comparative studies on the evolution of precarious employment across different population groups in EU-27 member states remain scarce. Orfao et al. (2021) made

a first approximation to the evolution of this phenomenon's incidence and intensity across EU countries for the period 2009-2016; however, their study focused solely on young workers aged 15-34. Furthermore, to the best of our knowledge, there is no prior evidence on the role of institutional and economic factors in shaping trends in precariousness across countries.

This paper seeks to add to the existing evidence by adopting a comparative perspective on the evolution of the incidence and intensity of precariousness across all EU member states. Using data from the European Union Labour Force Survey (EU-LFS), for the period 2009-2021, it generates and estimates an Adjusted Multidimensional Precariousness Index, which enables a comprehensive analysis of precariousness across time and between countries. Compared to previous studies, a novelty of the approach used in this paper is the decomposition of the evolution of both the incidence and intensity of precariousness by gender, age, education, sectors and occupations. A further contribution lies in examining the role of each dimension in shaping overall precariousness and the differences across countries. Finally, the paper investigates the determinants of precarious employment and discusses the main policy implications of the findings.

2. Literature Review

2.1 Definition and dimensions of precariousness

Precarious employment has become increasingly important and widely studied across Europe, as it is one of the main measures of job quality (Kalleberg, 2012). However, a key challenge associated with precariousness is the lack of a common definition and the dimensions and/or items that accurately identify this labour status (Kreshpaj et al., 2020). The International Labour Organisation (ILO) argues that precariousness is characterised by the heterogeneity of the forms it can take (ILO, 2012). The most common approach to define precarious employment is to measure it against a 'yardstick' job, typically identified as permanent, full-time, well-paid and with access to labour rights and social protection (Rodgers, 1989; Vosko, 2002, 2006). This approach reveals the multidimensional nature of precariousness; however, previous empirical studies have measured it using a wide variety of survey items and dimensions that vary across studies and countries (Kreshpaj et al., 2020). This limits existing knowledge about precariousness, particularly when it comes to cross-national comparative analyses.

Recently, Kreshpaj et al. (2020) conducted a systematic review of the definition of precariousness and the dimensions that constitute it. The authors initially identified five dimensions of precarious employment as measured in the literature: (i) income inadequacy, (ii) employment insecurity, (iii) lack of rights and social protection, (iv) work environment, and (v) health outcomes and social deprivation. Nevertheless, they emphasise that the two latter dimensions should not be included in the definition of precarious employment, as they capture the psychosocial work environment and its consequences on individuals' well-being (health, social and psychological). Interestingly, these dimensions align with those previously proposed by the ILO and Eurofound. On the one hand, the ILO identifies four dimensions (ILO,

2012): (i) low wages, (ii) poor protection from termination of employment (linked to temporary employment), (iii) lack of access to social protection/benefits (associated with part-time jobs), and (iv) limited access to exercise their rights at work.[1] On the other hand, Eurofound's definition of precariousness, based on the work of Olsthoorn (2014), includes three dimensions: insecure employment, unsupportive entitlements to income support when unemployed and employees vulnerability (few other means of subsistence) (Broughton et al., 2016; Eurofound, 2018b).

It should be noted that slight differences exist between the aforementioned definitions in terms of the items used to measure each dimension. For example, while Kreshpaj et al. (2020) include part-time employment as an indicator of employment insecurity, following the definition by Olsthoorn (2014) it would fit better as an indicator of unsupportive entitlements to income support when unemployed. This distinction arises because the former link the lack of rights and protection to the employed status (which is not specifically linked to part-time jobs), while the latter pertains to the unemployed condition. When comparing these approaches, although there is no standard definition of precariousness, there is a general agreement on three key dimensions: income inadequacy, employment insecurity and lack of rights and social protection.

ILO (2012) underscores that the forms of precarity appear to be continuously expanding, as employers constantly find new ways to circumvent regulations or exploit loopholes, thereby shifting risks and responsibilities onto employees. Consequently, the features linked to a standard job may evolve due to variations in terms of labour market practices and regulations. Based on previous approaches, a precarious job is defined in this paper as one that entails income inadequacy, employment insecurity and lack of rights and social protection (including poor working conditions). This definition should be understood from a 'job perspective', which differs from the concept of a precarious labour condition of the individual, such as that which may arise due to multiple jobholding (ILO, 2012). An additional argument in favour of adopting a 'job approach' is that there is a considerable heterogeneity among multiple jobholders, and precariousness is primarily linked to the quality of their primary job (Piasna et al., 2021).

Once precarious employment and its dimensions have been defined, the next issue is identifying precariousness within each dimension. First, with regard to income inadequacy, approaches differ between measuring it through low hourly wages (García-Pérez et al., 2017; Gutiérrez-Barbarrusa, 2016), monthly or annual wages (Murillo-Huertas et al., 2023), or incomes (Olsthoorn, 2014), mainly due to data availability. For instance, the OECD (2014, 2018) stresses that income is an issue of both absolute and relative terms. In this line, Murillo-Huertas et al. (2023) used two measures simultaneously for this dimension (both hourly and monthly wages) to analyse precariousness by gender in Spain.[2] Nevertheless, these studies

[1] The dimension on lack or limited access of workers to exercise their rights at work, as defined by the ILO (2012), includes insufficient or even a total absence of trade union rights. This is often explained by the limited ability to join trade unions, a situation particularly associated with temporary and subcontracted workers (ILO, 2012).

[2] Murillo-Huertas et al. (2023) show that the contribution of hourly wages to precariousness is smaller than that of monthly wages for Spain. Also, results differ by gender (probably due to the number of hours

agree that precariousness in this dimension is identified through low wages or incomes, i.e., if individual wages or incomes are below the 60% of the median, according to Eurostat threshold (García-Pérez et al., 2017; Murillo-Huertas et al., 2023; Orfao et al., 2021).

Secondly, Olsthoorn (2014) argues that insecurity may arise if a contract can be easily terminated by the employer; however, high unemployment benefits or policies aimed at reducing the unemployment duration (primarily active labour market policies) can mitigate this insecurity. Conceptually, Rodgers & Rodgers (1989) and Vosko (2006) upheld that without incorporating elements that indicate the severity of dismissal (e.g., access to unemployment benefits and length of unemployment), rather than merely its likelihood, precariousness is poorly measured and the threat of it neglected. For this reason, employment insecurity is mainly linked to two items: (i) poor protection against termination of employment, and (ii) underemployment. These are often measured through information on the type of contract (whether it is permanent or temporary) and the type of working day (full-time vs part-time) (Kreshpaj et al., 2020; Murillo-Huertas et al., 2023; Orfao et al., 2021). In this context, temporary contracts are associated with a higher probability of redundancy (Holmlund & Storrie, 2002), unpaid overtime (Orfao et al., 2024), limited chances of advancement (Amuedo-Dorantes, 2000) and lower wages (Davia & Hernanz, 2004; De la Rica, 2004) compared to open-ended jobs, which contributes to job insecurity. Moreover, part-time jobs have been linked to fewer opportunities for advancement (Russo & Hassink, 2008), lower job stability (Fernández-Kranz et al., 2015), low wages (Hirsch, 2005) and higher risk of dismissal and unemployment (Broughton et al., 2016; Kauhanen and Nätti, 2015).

Nevertheless, flexibility does not inherently generate precariousness, and non-standard employment do not necessarily make workers feel insecure (Fullerton et al., 2011). Some individuals may choose freely to work on a temporary or part-time on the basis of their preferences and their potential to contribute to career advancement and transitions to more standard jobs (Eurofound, 2011; Faccini, 2014; Mäkinen et al., 2023).[3] Also, they can be used as a strategy to balance work and family life (Rodríguez-Hernández, 2021) or reconcile work with education, particularly among young workers (Nicolaisen et al., 2019). In fact, the dead-end hypothesis is not linked to non-standard employment as a whole but rather to involuntary part-time employment and marginal part-time jobs (Broughton et al., 2016; Kauhanen and Nätti, 2015), as well as to temporary work agency jobs, involuntary temporary employment and casual/seasonal jobs (Filomena and Picchio, 2022; Kauhanen and Nätti, 2015).

In this regard, Kretsos & Livanos (2016), Murillo-Huertas et al. (2023) and Orfao et al. (2021) have identified employment insecurity specifically through involuntary temporary and part-time employment. Furthermore, Mäkinen et al. (2023) emphasise that working marginal hours (<15 hours per week) may also exclude individuals from social protection benefits,

worked which is not controlled). Consequently, results should be carefully interpreted, and comparisons must consider which wage measure is being used.

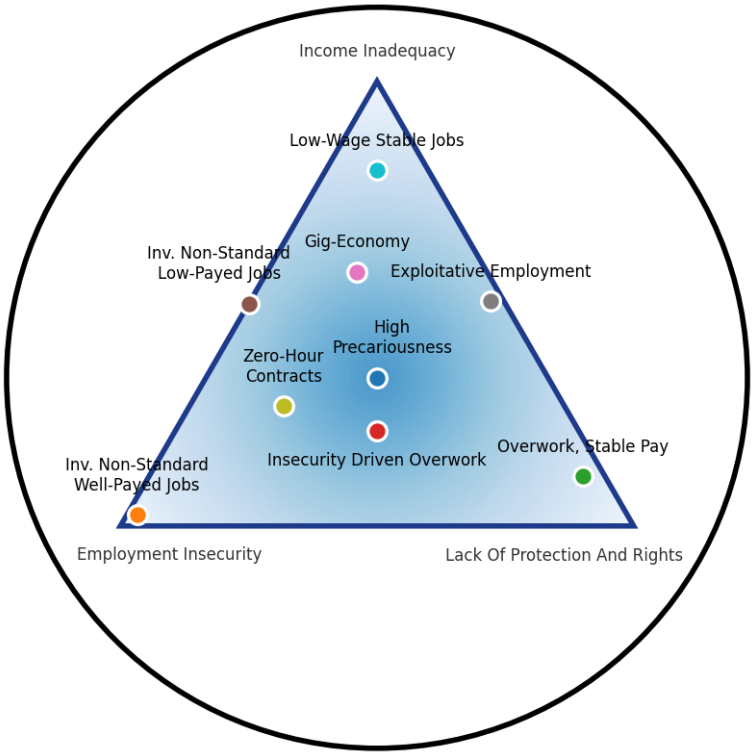
[3] Högberg et al. (2019) show a great heterogeneity in the transitions from temporary employment to permanent employment among young adults across EU countries, which is linked to the employment protection legislation and the vocational specificity of education systems.

depending on the regulatory framework. Accordingly, the length of part-time hours and marginal hours are well-established indicators of job quality (Messenger & Wallot, 2015) and precariousness (Fagan et al., 2014; Kalleberg, 2018).

Thirdly, there is a wide variety of items linked to precariousness in terms of the lack of protection and rights, including lack of unionisation (Kreshpaj et al., 2020), schedule unpredictability and work time control (Campos-Ugaz, 2022; Schneider & Harknett, 2019), long-working hours (Burger, 2020) and atypical working time (Campos-Ugaz, 2022; Murillo-Huertas et al., 2023). These factors can negatively affect workers' health, well-being, family fit, and self-assessments of work-nonwork interference (Campos-Ugaz, 2022). However, some of these factors may result from to the individuals' free rational choices, as posited by neoclassical economic theory (Varian, 2014). For instance, high earners may choose to work longer hours due to the substitution effect, i.e., the price of substituting an extra hour of work with leisure is more expensive for them. The paper discusses in the data section the way this issue is handled in the identification of precariousness. Under these conditions, Orfao et al. (2021) included the search for another job as a measure of precariousness, only if individuals were looking for better working conditions. By contrast, Murillo-Huertas et al. (2023) examined overqualification as an indicator of this dimension.

To summarise, theoretically, precariousness can arise due to various deficiencies within jobs, being possible to identify three types of precariousness: financial, job security and workplace rights precariousness. These three types, which are not mutually exclusive, form the basis of the conceptual framework developed in this paper. This framework enables the identification of the different forms of precarious employment observed in contemporary labour markets, as illustrated in Figure 1. These forms of employment may exhibit varying degrees of precariousness across the multiple dimensions identified. Specifically, each point within the triangle in Figure 1 represents a distinct type of precarious work situation (with the triangle itself representing precarious employment and the circle symbolising the whole labour market). Points located closer to a vertex indicate higher levels of precariousness in that particular dimension and lower levels in the others, whereas the centre represents situations of high precariousness across all three dimensions. Accordingly, points situated at a vertex reflect work situations dominated by a single type of precariousness, while points near the edges indicate situations of precariousness in two dimensions. The coloured dots illustrate specific cases of precarious work arrangements, positioned according to their relative strengths in each dimension. For example, insecurity-driven overwork driven by uncertainty about contract renewal and accompanied by low wages would be located near the centre, reflecting high levels of precariousness in all three dimensions. Likewise, casualised low-wage work is positioned near an edge, as it records precariousness in two dimensions. By contrast, an involuntary temporary job with good remuneration would be located in a vertex, indicating job security precariousness alone.

Figure 1: Typology of precarious forms of employment according to their degree of precariousness by dimension: income inadequacy, employment insecurity and lack of protection and rights.



Note: The positioning of each form of precarious employment within the figure is indicative and individual job positions may vary depending on the specific extent to which each dimension (income inadequacy, employment insecurity, and lack of protection and rights) is experienced.

Source: Authors' elaboration.

2.2 Determinants of precariousness

What factors explain precarious employment? Is it primarily a matter of individuals, or does the context also play a role? Do national contexts, institutions and labour market characteristics contribute to explaining cross-country differences? There is a wide literature about the relationship between individual factors and precariousness. In this regard, precarious employment has been revealed to be more prevalent among certain population groups, such as young workers (Kretsos, 2010; Orfao et al., 2021), women (Fudge & Owens, 2006; Murillo-Huertas et al., 2023), migrants (Porthé et al., 2009; Pradella & Cillo, 2015), older workers (D'Amours, 2009) or lower educated workers (Orfao et al., 2021). However, when considering the heterogeneity of economic and institutional factors across countries, the

asymmetric evolution of institutions geared towards ensuring labour market flexibility, and the unequal incidence of precariousness across EU countries, it becomes evident that country-level factors also influence the propensity towards holding a precarious job.

Several scholars have contended that employment has become more precarious due to rising economic competition, the deregulation of labour markets, the dismantling of social protection arrangements and the decline in the power of unions (Bourdieu, 1998; Kalleberg, 2011; Standing, 2011; Thelen, 2014). Still, efforts have been recently made in the opposite direction, by reducing gaps in social protection across forms of employment and extending collective bargaining to previously excluded workers (OECD, 2019). Kalleberg (2012) argues that precarious employment systems are not merely temporary features of the economic cycle but instead are driven by structural transformations of labour markets. This author argues that all countries face similar pressures resulting in increasing employment insecurity due to the social and economic forces associated with more intense globalisation, technological advances, greater mobility of capital and labour, new forms of organisational interdependence, and pressures that served to weaken unions (Kalleberg, 2012; 2018). Likewise, ILO (2012) underlines that precariousness can arise due to insufficient or total absence of trade union rights and collective bargaining agreements.

Kalleberg (2018) also states that although there is a common increasing trend of precariousness in developed economies, its incidence and consequences differ due to each country's social welfare protection system and labour market institutions. This author analysed six developed economies (Denmark, Germany, Japan, Spain, the United Kingdom and the United States), showing that precariousness is related to: (i) the union density and collective bargaining coverage, (ii) the private and public mandatory social expenditure[4], (iii) expenditure on active labour market policies, and (iv) the degree of employment protection legislation against dismissal of both regular and temporary workers. In particular, Kalleberg (2018) shows that country differences are explained by flexibility measures and the decline or removal of statutory and regulatory protections through several institutions such as unions, minimum wage laws, and social protection legislation.

Within the EU context, the number of comparative studies analysing the role played by economic and institutional factors on precarious employment is scarce, however, there are some previous works on specific countries or dimensions. For example, Lucifora et al. (2005) show through the analysis of 16 European countries that the extension of collective bargaining agreements, higher minimum wages and greater unemployment benefits are negatively correlated with the incidence of low wages. Interestingly, while higher levels of dismissal protection for permanent workers, centralised collective bargaining agreements and lower minimum wages increase temporary employment, part-time employment depends on the unions' strength and representation of part-time workers, unemployment benefits and

[4] OECD data on public and private social expenditure (SOCX database) includes a measure of aggregate expenditure on pensions, unemployment, health, disability, family support, housing, social inclusion, and active labour market policies.

childcare options (Hipp et al., 2015).[5] This evidence reveals the heterogeneity in the determinants of non-standard forms of employment, and still, these determinants may vary according to the voluntary nature of both temporary and part-time jobs. Furthermore, Haapanala (2022) analysed 25 EU countries and observed that higher expenditures in coercive active labour market policies increase involuntary part-time employment while supportive or soft policies reduce it.

To sum up, there is very little evidence on the role played by the economic and institutional factors on the incidence of precariousness as a whole (including all dimensions). This is probably due to data availability problems and the lack of a common definition on precariousness. A further challenge is the heterogeneity in the determinants of the different precariousness dimensions. Hipp et al. (2015) underline that there is considerable institutional complexity when studying the incidence of several non-standard forms of employment, and it can be difficult to disentangle the interactions between institutions. This could apply to precarious employment due to its multidimensional nature, which makes it difficult to interpret the effect of institutional and economic factors.

3. Methodological approach

3.1 The Adjusted Multidimensional Precariousness Index

This section describes the methodology used to analyse the incidence and intensity of precariousness in Europe during the period 2009-2021.[6] For this, a novel Adjusted Multidimensional Precariousness Index (AMPI) has been used. This methodology was introduced by Alkire & Foster (2007) in the field of multidimensional poverty and latterly applied to precarious employment by García-Pérez et al. (2017), Murillo-Huertas et al. (2023) or Orfao et al. (2021), among others. This indicator is calculated on a counting basis and has several advantages since it permits the analysis of all the dimensions of precariousness and to simultaneously measure the intensity and incidence of precariousness across European countries. Furthermore, the AMPI can break down the relative contribution of each dimension to the overall level of precariousness. In this approach, each dimension and item can be weighted also permitting to examine whether cross-country differences may vary if a greater relevance is given to a specific dimension. A common approach in previous studies employing the AMPI is to assign equal weights to each dimension (García-Pérez et al., 2017; Murillo-Huertas et al., 2023; Orfao et al., 2021). This practice stems from the assumption that no single dimension can be considered inherently more important than the others in the assessment of precariousness. Moreover, it is not methodologically possible to establish objective criteria

[5] See Hipp et al. (2015) for a detailed review of the empirical evidence on the institutional determinants of nonstandard employment.

[6] Since data on the employment insecurity dimension are available up to 2023, the analysis of its incidence has been extended through 2023 for all countries.

for assigning separate weights to each of the dimensions. Finally, another benefit of this methodology is that it can be decomposed by different population subgroups according to several job or socio-demographic characteristics, such as gender, age, education, occupation or sector.

To measure precariousness, a double threshold is used. First, once the items measuring precariousness in each dimension have been defined, a threshold is established for each dimension to identify when a job can be considered precarious in a particular dimension, such as income inadequacy. In a second step, another threshold must be defined to identify a job as precarious, i.e., how many dimensions should present precariousness for a job to be considered precarious.

If X_{ij} is defined as the observation of dimension *j* for each individual *i* (with *j* = 1, …, 3) and Z_j as the thredhold established for dimension *j*, then a job is considered precarious in dimension *j* if $X_{ij} \leq Z_j$. After determining Z_j for each dimension, a new variable *P* is defined to measure the number of precarious dimensions of each individual's job (preliminary step to establish the second threshold). For each individual *i*, *P* is calculated as:

$$P_i = \sum_{j=1}^{4} w_j I_{\{X_{ij} \leq Z_j\}} \qquad i = 1, \dots, n$$

being $I_{\{X_{ij} \leq Z_j\}}$ the indicator function of set $\{X_{ij} \leq Z_j\}$, w_j the weight assigned to each dimension and *n* the total number of individuals. As previously done by García-Pérez et al. (2017), Murillo-Huertas et al. (2023) and Orfao et al. (2021), the same weight is assigned to each dimension (⅓). P_i will take values between 0 and 3, where smaller values reflect lower levels of precariousness. For instance, a value of 0 indicates that an individual's job is not precarious in any dimension, whereas a value of 3 that it is precarious in all the dimensions. Again, following previous works, the second threshold which identifies a job as precarious has been established in $P_i \geq 1$, i.e. a job is considered as precarious if precariousness exists in at least one dimension.

Once these two thresholds have been defined, the incidence and intensity of precariousness can be measured. To measure the former, the rate of precariousness is calculated through variable *P*. Being *H* the rate of precariousness, it can be calculated as follows:

$$H = \frac{\sum_{i=1}^{n} I_{\{P_i \geq 1\}}}{n} = \frac{q}{n}$$

where *q* represents the number of jobs identified as precarious according to the second threshold established ($P_i \geq 1$). In parallel, the intensity of precariousness can be measured through an indicator *A*, which captures the average number of precarious dimensions among precarious jobs divided by the total number of dimensions. In this sense, a higher value of *A* indicates a higher intensity of precariousness. *A* is defined as follows:

$$A = \frac{\mu_p^q}{D} \qquad with \;\; \mu_p^q = \frac{\sum_{i=1}^{n} P_i I_{\{P_i \geq 1\}}}{\sum_{i=1}^{n} I_{\{P_i \geq 1\}}}$$

being μ_p^q the average number of precarious dimensions among precarious jobs and *D* the total number of dimensions, which in this case is 3. A takes values between 0 and 1, with values of ⅓, ⅔ and 1 corresponding to an average of one, two and three precarious dimensions among precarious jobs, respectively. The interest in analysing the intensity of precariousness is that an individual's labour market situation is qualitatively different as the number of precarious dimensions increases since the risks associated with each dimension accumulate. The Adjusted Multidimensional Precariousness Index is calculated by taking into consideration both the incidence (H) and intensity (A) of precariousness. It usually is defined as M_0,

$$M_0 = \frac{\sum_{i=1}^{n} P_i I_{\{P_i \geq 1\}}}{nD} = H \times A$$

AMPI or M_0 can be calculated for each EU Member State *k*, with *k* = 1, …, 27. To facilitate the interpretation of the results, an M_0 value below 0.11 is considered indicative of a low level of precariousness (this value corresponds to a scenario in which ⅓ of employees are in precarious jobs and ⅓ of the dimensions are precarious). Values between 0.12 and 0.25 denote a moderate level of precariousness (this threshold reflects a combination of ½ employees are in precarious jobs and ½ of job dimensions are precarious). Scores above 0.25 indicate a high level of precariousness (more than ½ employees are employed in precarious jobs or more than ½ of job dimensions are precarious, or both simultaneously). This categorisation follows the approach proposed by Murillo-Huertas et al. (2023). Additionally, as aforementioned M_0, *H* and *A* can be decomposed according to different socio-demographic characteristics such as gender, age, etc. This means that detailed estimates of precariousness can be produced to analyse whether, for example, gender differences may arise due to a different precarious incidence, intensity or both aspects of precariousness, or conversely, whether they stem from a higher prevalence of a specific dimension.

3.2 Econometric regression models

To analyse the determinants of precarious employment and its intensity, several fixed effects logistic and linear regression models are estimated. While the number of countries and years could have allowed for the use of multilevel models to investigate the variation of precariousness *between* countries the intraclass correlation coefficient was below 0.05 which indicates that variation in precariousness is driven mainly by *within* country factors. In this sense, logistic and linear regression models have been estimated using the likelihood of having a precarious job (incidence) and the number of precarious dimensions (intensity) as dependent variables, respectively. While the first variable is binary (precarious vs non-precarious), the latter is a continuous variable that can take both integer and fractional values. Models have been estimated using time and country fixed effects, as this paper aims to explain within variation while controlling for unobserved heterogeneity across countries and years. This approach accounts for differences in certain economic, institutional or labour market characteristics that vary over time and between countries, which can affect precariousness as

previously discussed.[7] If y_{ij} is taken as each dependent variable of individual *i* in country *j* for year *t*, the logistic and linear models estimated can be defined as follows:

$$y_{ijt} = \alpha + \beta X_{ijt} + \gamma_j + \delta_t + \varepsilon_{ijt}$$
$$i = 1, \dots, n$$
$$j = 1, \dots, k$$
$$t = 1, \dots, T$$

where *n* represents the total number of individuals, *k* of countries and *T* of years, X_{ij} is the set of socio-demographic and job-related variables, γ_j represents the country fixed effects, δ_t the time effects, and ε_{ijt} the error term.

4. Data

The data used in this study are drawn from the European Union Labour Force Survey (EU-LFS), provided by Eurostat, covering the period 2009-2021. This dataset offers a uniform and homogeneous sample across all EU-27 countries, along with detailed information on a range of variables that allow to analyse all the dimensions of precariousness over time. Furthermore, it includes data on various individual- and job-related characteristics (e.g., age, gender, education, occupation and sector), which allow for the decomposition of the AMPI. The time frame ranges from 2009 to 2021 based on data availability for all countries (i.e., income information is missing for most countries before 2009 and after 2021). Lastly, the main disadvantage of the dataset is the absence of income data for Sweden, leading to its exclusion from the analysis. Additionally, a small number of countries lack income data for one year, primarily 2021.

As discussed in the literature review section, three dimensions have been identified when measuring precarious employment: income inadequacy, employment insecurity and the lack of protection and rights. The EU-LFS provides a set of indicators that allow the measurement of these dimensions. Table 1 presents the set of items used to measure each dimension, along with their assigned weights. These items make it possible to capture all precarious work situations outlined in the theoretical framework (Figure 1), and to develop an indicator (the AMPI) that summarises both the overall levels and the intensity of precariousness across EU countries.

Table 1: Summary of the items, dimensions and weights used to analyse precariousness incidence and intensity through the Adjusted Multidimensional Precariousness Index across EU-27 countries for the period 2009-2021.

Dimension	Weight	Items measuring each dimension	Item weight

[7] As a robustness check, models have been also estimated without including time and country fixed effects. Based on Akaike's Information Criteria, the results indicate a better fit for the fixed effects models.

Income inadequacy	(1/3)	Low incomes (incomes under 60% of the median of the incomes distribution).	(1/3)
Employment insecurity	(1/3)	Involuntary temporary employment, involuntary part-time employment or marginal part-time work (working fewer than 15h/week).	(1/3)
Lack of protection and rights	(1/3)	Lack of decision or excessive working hours (wish more or works more than 48h/w).	(1/9)
		Atypical working time (shifts, Saturdays, Sundays, nights, evenings).	(1/9)
		Search for employment (both search and PES register).	(1/9)

Note: Items have been selected according to the information available in the EU-LFS for the whole period analysed.

Source: Author's elaboration based on EU-LFS data.

First, to capture the income inadequacy dimension and consequently financial precariousness, monthly income information is used. It is important to note that although Eurostat gathers data on gross monthly pay from the main job, this information is not available in the scientific use files. Instead, data are provided in deciles. The threshold used to identify precariousness within this dimension is set at 60% of the median within the distribution of monthly incomes. This value is not arbitrary but set in line with Directive (EU) 2022/2041 of the European Parliament and of the Council of 19 October 2022 on adequate minimum wages in the European Union, which requires Member States to set 'indicative reference values' to guide their assessment of the adequacy of statutory minimum wages. Accordingly, a job is considered precarious in this dimension if the individual's monthly income is below this threshold. This threshold, proposed by Eurostat to measure low wages/incomes, has been employed in previous studies (García-Pérez et al., 2017; Murillo-Huertas et al., 2023; Orfao et al., 2021).

Second, for the employment insecurity dimension, three distinct indicators are used to identify those types of employment associated with job security precariousness. A job is considered precarious if it satisfies at least one of the three following conditions: it is an involuntary temporary contract, an involuntary part-time job, or a marginal part-time job (defined as working fewer than 15 hours per week). While involuntary temporary and part-time jobs have been commonly used as proxies for employment insecurity (Murillo-Huertas et al., 2023; Kretsos & Livanos, 2016; Orfao et al., 2021), marginal part-time employment has not been widely used. However, the rationale behind setting these conditions is that these non-standard forms of employment have been revealed in previous literature to be linked to the dead-end hypothesis rather than to the stepping stone effect (Broughton et al., 2016; Filomena and Picchio, 2022; Kauhanen and Nätti, 2015). These items are identified in the EU-LFS through data on the type of contract, type of working day, usual weekly working hours,

and the reasons for holding a temporary or part-time job.[8] With this approach, a student voluntarily engaged in part-time or temporary employment due to educational commitments, or an individual in such jobs seeking work and family life balance, would not be considered precarious in this dimension. In contrast, individuals who are willing to work full-time or in a permanent position but are unable to do so would be classified as being in precarious employment. This also applies to those working very few hours, such as zero-hour workers, who would be considered to face job security precariousness.

Third, the lack of protection and rights has been previously identified through several indicators, including schedule unpredictability and lack of work time control (Campos-Ugaz, 2022; Schneider & Harknett, 2019), working long hours (Burger, 2020), engaging in atypical working time (Murillo-Huertas et al., 2023), looking for another job with better working conditions (Orfao et al., 2021), lack of unionisation (Kreshpaj et al., 2020), and being overqualified (Murillo-Huertas et al., 2023). With the EU-LFS, it is possible to identify some of these indicators to measure workplace rights precariousness. The specific items used are: (i) lack of decision on the number of hours worked or excessive working hours (defined as more than 48 hours per week), (ii) atypical working time (including work on Saturdays, Sundays, evenings, nights, or shifts), and (iii) actively searching for employment or being registered in Public Employment Services (PES). As previously mentioned, some of these factors may result from the individuals' free rational choices. For this reason, equal weight is assigned to each item within this dimension (Table 1), which allows for a more accurate estimation of workplace rights precariousness. For instance, if a job is not precarious in any other dimension but involves excessive working hours (> 48h/week), it is not classified as precarious. An example of this could be a firm manager with a permanent, full-time job working more than 48 hours per week and earning high wages. However, if a job is precarious in another dimension and, in addition, it involves excessive working hours, it will be considered precarious and will register a higher intensity in the AMPI index. Also, if an individual works excessive hours, engages in atypical working time, and is simultaneously looking for another job, the job will be classified as precarious within this dimension. Likewise, an individual working on weekends with a stable wage and a permanent position would not be considered as precarious. Nevertheless, working on weekends combined with low wages would be classified as a more intense form of precariousness than a job involving low wages alone.

5. Results

In subsection 5.1, the evolution of the AMPI index is analysed as well as the rate of precariousness across the EU-27 countries from 2009 to 2021. This includes the relative contribution of each dimension to overall precariousness, as well as cross-country differences

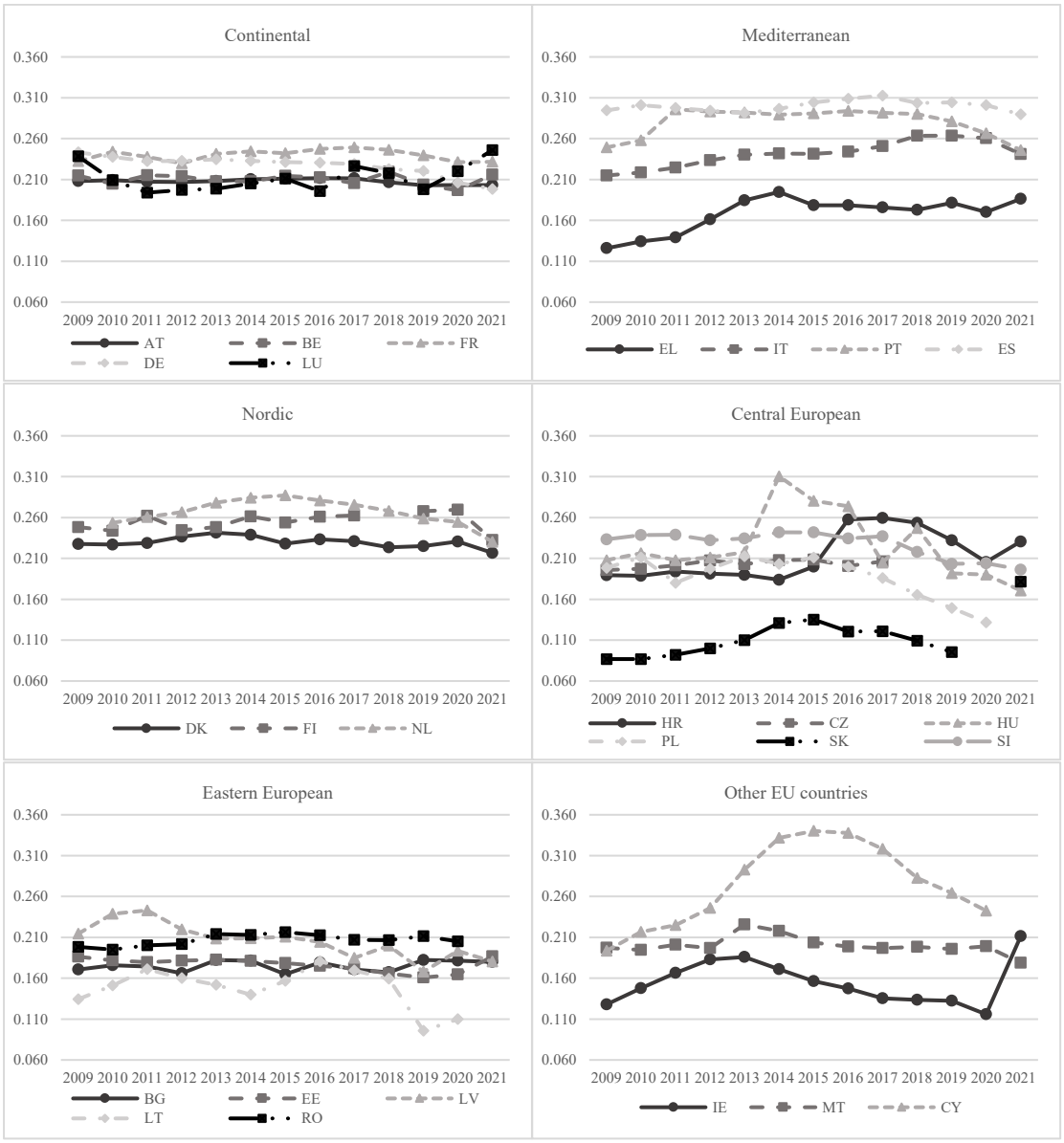
[8] Other authors include temporary and part-time employment as a proxy for employment insecurity (e.g., see García-Pérez et al., 2017); however, as discussed, not all temporary and part-time jobs can be classified as precarious.

by gender, age, educational attainment, country of birth, and sector of economic activity. Subsection 5.2 explores the microlevel determinants of precarious employment, along with those of its intensity.

5.1 Adjusted Multidimensional Precariousness Index: incidence and intensity

Figure 2 displays the evolution of the rate of precariousness across EU countries for the period 2009-2021. To simplify interpretation, countries are clustered into distinct welfare state regimes. Several key findings stand out. First, certain Mediterranean countries, particularly Spain and Portugal, consistently display the highest incidence of precariousness, with values around 30 percent of the employed population. They are followed by Nordic, Continental and Central European countries, where the rates range between 20 and 28 percent. In contrast, the lowest levels of precariousness are observed in most Eastern European countries, which is mainly attributed to the lower incidence of atypical work and involuntary non-standard employment. Nevertheless, when focusing solely on financial precariousness, precariousness is higher in most Central and Eastern European countries compared to their Mediterranean and Nordic counterparts (a detailed discussion of each dimension's contribution follows below). Furthermore, it should be noted that the higher levels of precariousness in Nordic and Continental countries are accompanied by very low rates of inactivity and NEETs, whereas the opposite pattern is observed in most Central and Eastern European countries (Mascherini, 2018). Consequently, it appears that flexible practices and non-standard employment can bring stronger labour market integration but also greater job security precariousness, particularly among young people, as will be shown.

Figure 2: Rate of precariousness (H) across EU-27 countries by welfare state groups, 2009-2021.



Source: Authors' estimations based on EU-LFS data.

Second, in terms of its evolution, the rate of precariousness exhibited two distinct trends across countries during the period from 2009 to 2021. In most cases, the rate remained relatively stable over time. This is particularly true for the Continental countries, where the 2008 economic crisis had only a marginal impact on the incidence of precariousness. Nevertheless, in other countries such as Greece, Italy, Ireland and the Netherlands, a steady increase is observed following the Great Recession. The case of Cyprus is particularly noteworthy, as it recorded the largest increase in precariousness after the 2008 economic crisis, rising from 20 to 34 percent. However, after 2015, the year that marked the start of economic recovery from the Global Financial Crisis, the rate of precariousness declined in

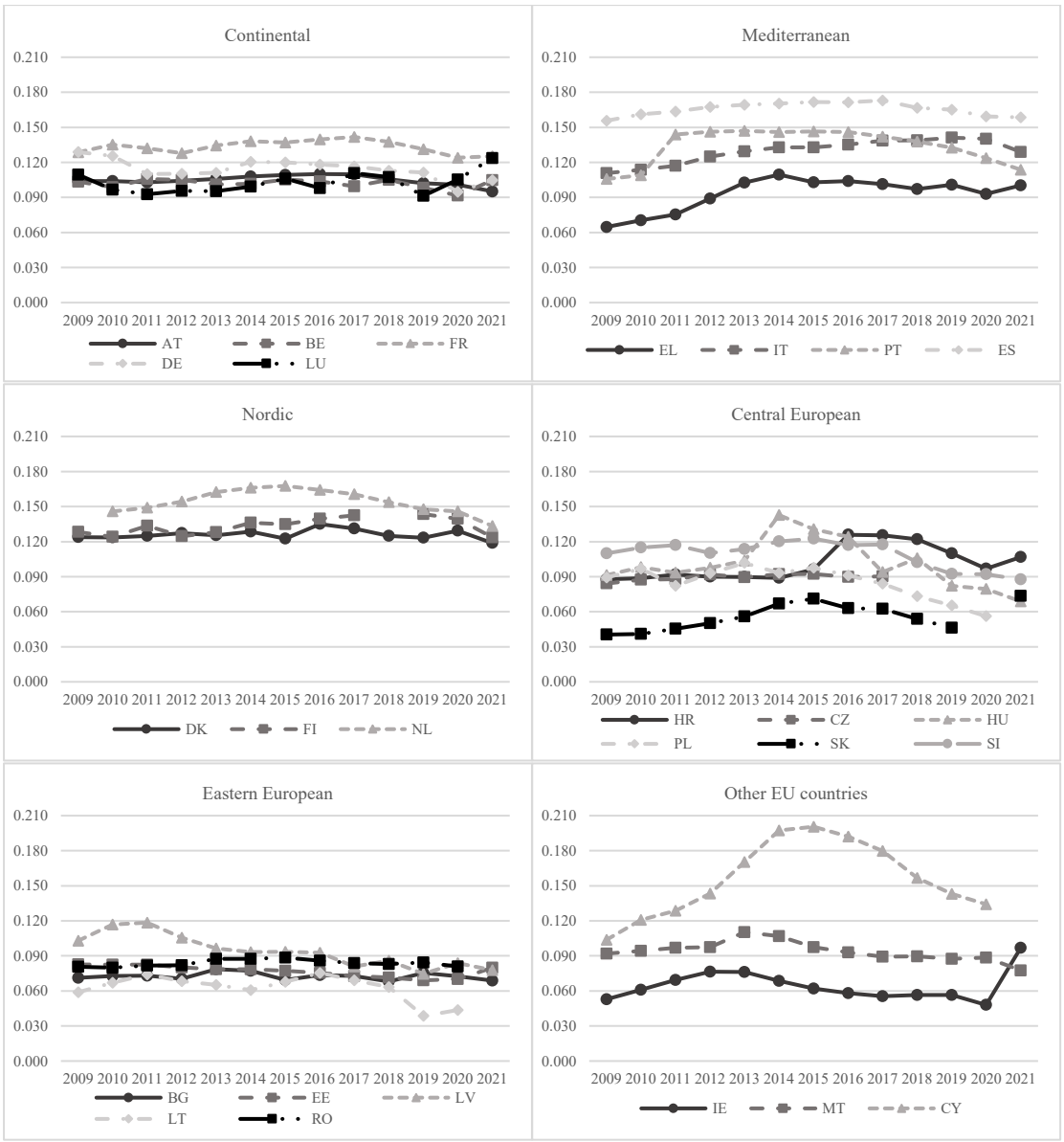
most countries. This evidence suggests that the incidence of precariousness is shaped by the business cycle. Next sections will further explore this cyclical nature of precariousness when jointly analysing its incidence and intensity.

Figure 3 illustrates the evolution of the AMPI across EU-27 countries over the period analysed. When considering both the incidence and intensity of precariousness simultaneously, notable differences emerge across countries, as well as an asymmetric evolution over time. Among the Mediterranean and Nordic countries, the AMPI is greater in Spain and the Netherlands (around 0.16-0.17 points). This is primarily due to a greater intensity of precariousness in both countries, meaning that precarious jobs tend to accumulate more precarious dimensions (with an average of around half the possible deficiencies per job). A particularly noteworthy finding is that, while the increase from 0.14 to 0.17 points in the AMPI in the Netherlands between 2009 and 2015 is driven by a rise in the incidence, its intensity remained largely unchanged. To quantify these changes, in the Netherlands the number of precarious jobs increased by 165.4 thousand during this period, even as the overall number of employees decreased by 236.1 thousand. By contrast, the AMPI increased in Spain from 0.15 to 0.17 points over the same period due to a rise in the intensity of precariousness, despite the very small decline in its incidence (the number of precarious jobs diminished by 193,2 thousand). This suggests that the increase in the intensity of precariousness overshadowed the changes in the incidence. The decline in incidence observed in Spain could be partly attributed to the lower dismissal costs associated with temporary employment, which was widespread before 2008. In the other Nordic and most Continental, Eastern and Central European countries, the intensity of precariousness is very low, which results in a lower AMPI (around 0.11 points or below). In other words, when a job is precarious in these countries, it tends to involve only a single dimension of precariousness, primarily low wages (i.e., financial precariousness). The unequal contribution of each dimension to precariousness is further examined below.

The cyclical nature of precariousness is marked in the rise in its incidence across most countries after the 2008 economic crisis, followed by a decline during the subsequent period of economic expansion. This later decrease may be attributed to the favourable macroeconomic context and to policy efforts by European institutions and national governments aimed at reducing precarious and non-standard employment. For example, initiatives such as the European Pillar of Social Rights (EPSR), the ‘socialisation’ of the European Semester and related actions have focused on improving working conditions, promoting social inclusion, enhancing employment quality, and ensuring adequate minimum wages. Still, despite this downward trend, several Mediterranean and Central European countries, such as Greece, Italy, Croatia and Slovakia, reported a higher AMPI in 2021 compared to 2009. It is worth noting that the AMPI has been tested using alternative weighting schemes, as shown in Figures A1 and A2 in the Appendix. However, the results do not vary substantially. The only difference arises when a greater weight is assigned to the dimension of employment insecurity: under this specification, the AMPI is slightly higher in the Netherlands and in the Mediterranean countries (around 0.19 points), due to the higher incidence of involuntary part-time and temporary employment. Accordingly, the gap in the

AMPI widens to some extent between these countries and the rest of European countries, particularly the Eastern European counterparts.

Figure 3: Adjusted Multidimensional Precariousness Index (AMPI) across EU-27 countries by welfare state groups, 2009-2021.

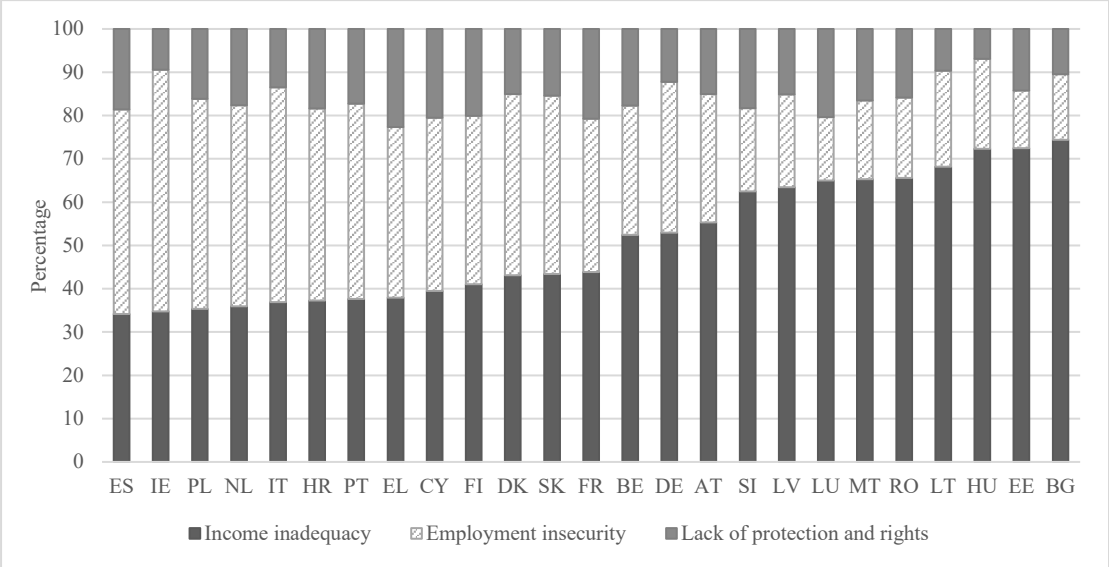


Source: Authors' estimations based on EU-LFS data.

As aforementioned, a key property of the AMPI is its capability to decompose the specific contribution of each dimension. Figure 4 captures the relative contribution of the income inadequacy, employment insecurity and lack of protection and rights dimensions to overall precariousness across EU-27 countries in 2019. Different patterns are observed across countries, with notable similarities within each welfare state regime. In the bulk of Continental, Eastern and Central European countries, income inadequacy contributes the

most to precariousness, accounting for between 52% and 74%. By contrast, in Mediterranean and Nordic countries, employment insecurity plays a more significant role, contributing between 39% and 56% to overall precariousness. Some exceptions are found, such as in Poland and Hungary, where the widespread involuntary temporary employment promotes the relative importance of the employment insecurity dimension. A common pattern across countries is the relatively smaller contribution of the lack of protection and rights, which accounts for between 7% and 22% of overall precariousness.

Figure 4: Relative contribution of income inadequacy, employment insecurity and lack of protection and rights to overall precariousness across EU-27 countries in 2019.



Note: There is no information on income inadequacy for the Czech Republic, thus the relative contribution of each dimension cannot be calculated for this country.

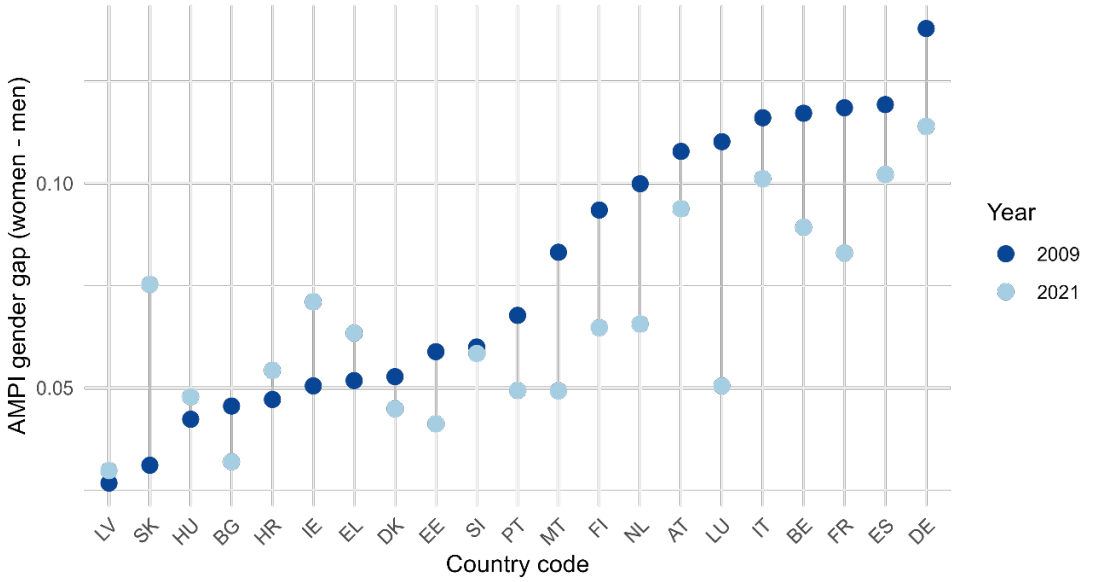
Source: Authors' estimations based on EU-LFS data.

When examining the evolution of each dimension's relative contribution, two main trends emerge over time (Figures A3, A4 and A5 in the Appendix). During the period 2009-2015, in general, a slight decline is observed in the contribution of the income inadequacy dimension, ranging from 3 to 10 percentage points depending on the country. This decline was accompanied by a corresponding increase in the relative contribution of the employment insecurity dimension. This shift appears to be driven by the documented rise in involuntary non-standard employment. Some exceptions to this pattern are found in Eastern European countries and certain Central European counterparts, such as Hungary and Slovenia. In these countries, the contribution of the income inadequacy dimension has steadily increased throughout the entire period, for example, reaching levels as high as 80% in Bulgaria.

However, from 2016 onwards, the opposite trend emerges, with a declining contribution of employment insecurity to overall precariousness and a corresponding increase in the weight of income inadequacy. This pattern may be attributed to the actions taken at the European level and by national governments to address the increase in non-standard forms of

employment. Figure A6 illustrates the evolution of the employment insecurity dimension's incidence from 2009 to 2023 (which is the only dimension with available data until 2023). Interestingly, a consistent downward trend is observed in this dimension's incidence across EU-27 countries since the recovery from the Great Recession. This reflects a reduction in involuntary part-time, involuntary temporary and marginal part-time employment. It is important to note, however, that the consistent decline in the incidence of employment insecurity is not fully reflected in its relative contribution to overall precariousness. This is due to a general improvement in the lack of protection and rights dimension across EU countries during this period. In this line, a decline in employment insecurity is also observed in the aftermath of the COVID-19 pandemic in the majority of European countries, including the Netherlands, Belgium, Germany, Spain or Poland, among others. This pattern suggests a structural shift in the composition of precariousness, potentially reflecting broader changes in labour market conditions and social protection systems.

Figure 5: Gender gap (women – men) in the Adjusted Multidimensional Precariousness Index (AMPI) across EU-27 countries, 2009-2021.



Note: Due to the unavailability of 2009 data for the Netherlands, the values reported for that year refer to 2010.

Source: Authors' estimations based on EU-LFS data.

There is extensive evidence on the differentiated incidence of precariousness across population subgroups, such as women, young people and immigrants (Fudge & Owens, 2006; Murillo-Huertas et al., 2023; Orfao et al., 2021; Pradella & Cillo, 2015). However, less is known about cross-country differences and their evolution within the European context. Figure 5 presents the gender gap (women-men) in the AMPI across EU-27 countries between 2009 and 2021. This figure shows that the AMPI is consistently higher among women in all European countries, indicating a persistent gender gap in precariousness. Nevertheless, the size of this

gap varies across countries and has changed over time. The gender gap is particularly large in the Continental countries, as well as in Cyprus, Spain and Italy (it reaches around 0.10-0.12 points), followed by Finland and the Netherlands (with values around 0.08 points). This disparity may be explained by the overrepresentation of women in involuntary part-time employment and by the gender wage gap. Remarkably, most Continental countries, along with Cyprus, Finland and the Netherlands, exhibit a declining trend throughout the whole period, thereby narrowing the gender gap. An explanation to this finding is the reducing trend in the wage gender gap, as documented over the past two decades by Orfao et al. (2025). Spain and Italy also show a slight reduction, although it is smaller in magnitude. By contrast, the gender gap has remained mostly unchanged in the rest of the European countries, with a slight increase observed in a few cases (typically in countries with initially smaller gender disparities. Thus, these findings point to a broader trend of gender convergence in precariousness across the EU between 2009 and 2021. This convergence is explained by a mix of a general improvement in women's AMPI and worsening in men's AMPI in a bulk of European countries. Specifically, precariousness has slightly increased among men in Mediterranean countries, Ireland, and certain Continental and Central European countries, such as Belgium, France, Hungary and Slovakia.

In addition to gender differences, Figure 6 shows that the AMPI also varies considerably by age, particularly when comparing young individuals (aged 15-29) with adults (aged 30-64). Once again, substantial heterogeneity is observed across countries. The most striking case is that of the Nordic countries, where the AMPI among young employees is between 0.2 and 0.3 points higher than among adults. This arises due to both a larger incidence and intensity of precariousness among younger individuals. To contextualise the magnitude of these differences, in Denmark in 2015, the intensity indicator (*A*) stood at 0.58 for young people and 0.46 for adults, while the incidence indicator (*H*) was 0.59 and 0.11, respectively. In other words, 59 percent of young employees were in precarious employment compared to just 11 percent of adults, and their jobs also concentrated more precarious dimensions. Therefore, a 0.3-point difference in the AMPI can be considered very large. In contrast, a moderate gap by age is found in the Mediterranean and certain Central European countries (ranging from 0.12 to 0.2 points), and a low gap in most Continental (below 0.1 points) and Eastern European countries (below 0.05 points). In terms of its evolution, a general increasing trend in the age gap is observed across EU countries until around 2015, followed by a subsequent decrease. Notably, it appears that the COVID-19 pandemic particularly affected young people in Ireland, Greece and Spain, where a significant increase in precariousness among youth is observed from 2020 to 2021. However, the age gap was narrowing in these countries until 2020.

These age-related differences observed in the Nordic countries support the theory that precariousness can be considered (at least partially) a transitory phase in labour careers, with higher levels typically occurring during the school-to-work transition. Conversely, the smaller age gaps in Eastern European countries may reflect barriers to labour market entry for young people, leading to high unemployment, NEET and inactivity rates (Mascherini, 2018), but also a greater likelihood of securing a permanent or full-time job once labour market access is achieved. The greater age gap in precariousness found in Nordic countries, alongside lower

NEET rates among young people, raises the question of whether it is preferable to be in the labour market in a precarious position or to remain outside of it. Considering the low levels of precariousness among adults in Nordic countries (as measured by the AMPI), it appears that, in the long term, remaining in the labour market (even in a precarious job) may be more beneficial than not working. To further explore this dynamic, it is crucial to examine the role of labour market experience in explaining the likelihood of precariousness, a topic addressed in the following section. Furthermore, the widening gap between young and adult individuals in the Mediterranean countries deserved particular attention, as it may have important implications, such as delaying emancipation and parenthood among young people. A common finding across all countries is that both the incidence and intensity of precariousness are greater among young people. However, lower wages, for example, may be expected among young individuals due to their limited labour experience.

Figure 6: Age differences (young – adult) in the Adjusted Multidimensional Precariousness Index (AMPI) across EU-27 countries, 2009-2021.

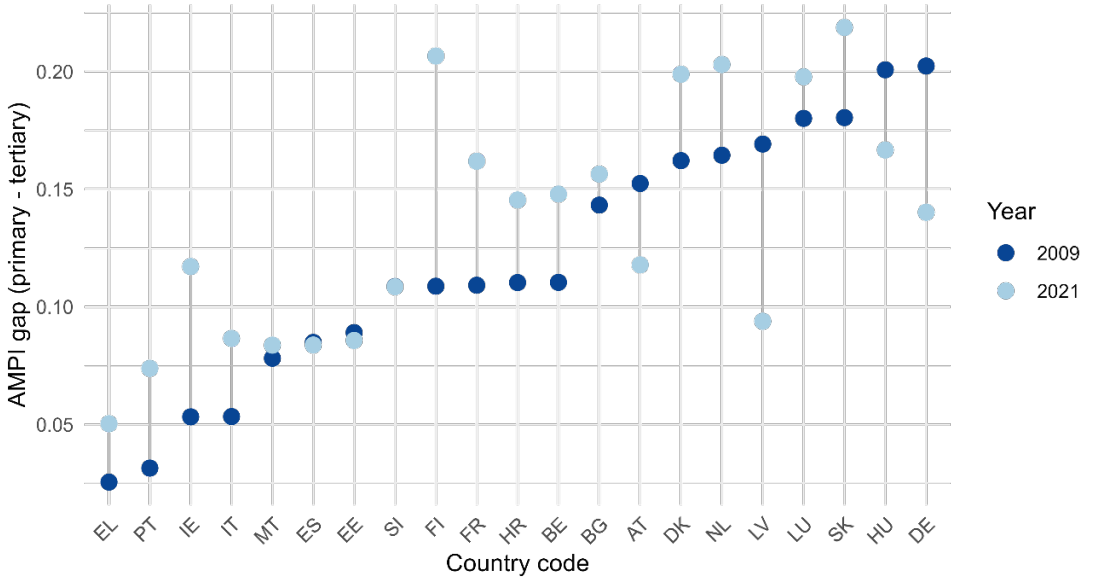
Note: Due to the unavailability of 2009 data for the Netherlands, the values reported for that year refer to 2010.

Source: Authors' estimations based on EU-LFS data.

Figures 7 and 8 illustrate cross-country differences in the AMPI according to highest educational attainment and country of birth over the period analysed. On the one hand, the AMPI decreases as the level of education increases in all countries. However, this decline is less pronounced in the Mediterranean countries, likely due to the widespread incidence of precariousness even among highly educated workers (as shown for young people by Orfao et al. 2021). Interestingly, both the incidence and intensity of precariousness are lower among individuals with tertiary education compared to those with below-secondary education

(although intensity differences are smaller in magnitude). On the other hand, foreign-born individuals record a slightly higher AMPI than native-born individuals in most countries. Nevertheless, these differences are relatively small, except in several Mediterranean countries, particularly Greece, Spain and Italy. This may be explained by the occupational segregation of foreign-born individuals in these countries, who tend to concentrate in low-skilled occupations. Notably, these European countries also record the highest migration rates.

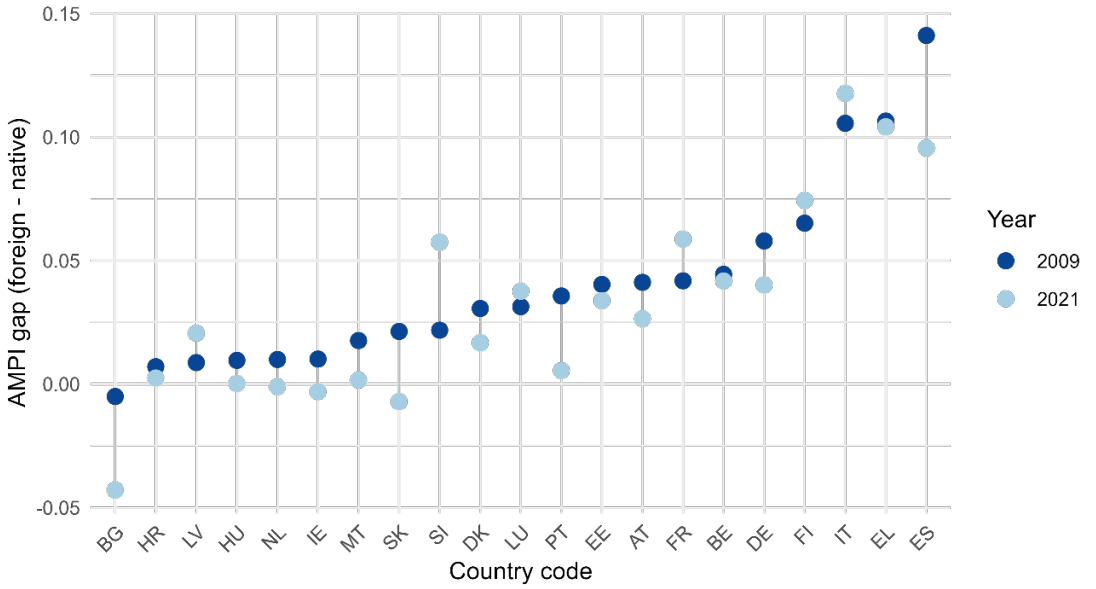
Figure 7: Differences by highest educational attainment level (primary – tertiary) in the Adjusted Multidimensional Precariousness Index (AMPI) across EU-27 countries, 2009-2021.



Note: Due to the unavailability of 2009 data for the Netherlands, the values reported for that year refer to 2010.

Source: Authors' estimations based on EU-LFS data.

Figure 8: Differences by country of birth (foreign-born – native-born) in the Adjusted Multidimensional Precariousness Index (AMPI) across EU-27 countries, 2009-2021.



Note: Due to the unavailability of 2009 data for the Netherlands, the values reported for that year refer to 2010.

Source: Authors' estimations based on EU-LFS data.

Figure 9 shows the differences in the AMPI between the private service and manufacture sectors for the period 2009-2021.[9] Interestingly, while precariousness is more widespread within the private service sector in Continental and Nordic countries, the sectoral differences are less pronounced in Central and Eastern European countries. In some of the later, such as Croatia, Latvia and Bulgaria, precariousness was actually higher in the manufacture sector than in both public and private service sectors, particularly in 2009 (Table A1). By contrast, Mediterranean countries occupy an intermediate position between these two patterns. It is also important to consider that significant variation is expected within sectors, especially within the service sectors. Although a distinction is made between predominantly public and predominantly private service sectors, the levels of precariousness appear to be quite similar across them. Nevertheless, substantial heterogeneity likely exists within each sector, particularly due to differences across occupational categories, for example, between low- and high-skilled jobs. This occupational distinction is accounted for in the econometric models discussed in the following subsection.

[9] Table A1 has been included in the appendix. This table presents the difference AMPI in 2009 and 2021 across macro-aggregated groups for sectors as defined by Eurofound (2020). These groups of sectors are: (i) agriculture and extractive, (ii) manufacturing, (iii) construction, (iv) mainly private services, and (v) mainly public services.

Figure 9: Differences in the Adjusted Multidimensional Precariousness Index (AMPI) between economic sectors (private services – manufacture) across EU-27 countries, 2009-2021.

Note: Due to the unavailability of 2009 data for the Netherlands, the values reported for that year refer to 2010

Source: Authors' estimations based on EU-LFS data.

To sum up, our findings reveal higher employment precariousness in Mediterranean and Nordic countries, with Spain and the Netherlands leading the way, while Continental and Eastern European countries report moderate and low levels of the AMPI, respectively. However, it should be noted that precarious jobs and non-standard employment can act as a bridge between unemployment and more standard jobs. In fact, the age differences observed in the Nordic countries suggest that precariousness may be a transitory phase, at least in these countries. In addition, although certain Eastern European countries have low levels of precariousness, such as Estonia, Latvia or Lithuania, they also have high rates of unemployment, young NEETs and inactivity (Mascherini, 2018). Cross-country differences partly stem from the varying contribution of each dimension to overall precariousness. In general, financial precariousness contributes the most to precariousness in Continental, Eastern, and Central European countries, while in Mediterranean and Nordic countries, job security precariousness plays a more significant role due to the widespread use of involuntary part-time and temporary employment. The increase in precariousness after the Great Recession, followed by a decline from 2015, indicate that precariousness is influenced by both structural factors and the economic cycle. Finally, notable differences by gender, age, education and country of birth underscore the fact that precariousness is a complex phenomenon shaped by the interplay of several factors. These factors are further examined in detail in the following subsection.

5.2 The determinants of precariousness

Table 2 presents the estimated effects across four distinct models. Models 1 and 2 report the outcomes of logistic regressions estimating the probability of holding a precarious job, whereas Models 3 and 4 provide estimates for the intensity of precariousness, that is the number of precarious dimensions within the individual's job. Although all results are displayed in Table 2, the discussion focuses solely on Models 2 and 4, which incorporate both time and country fixed effects. This choice is guided by the Akaike's Information Criteria (AIC) and R-square values. To facilitate the interpretation of the results, the coefficients in Model 2 represent marginal effects on the likelihood of holding a precarious job. In contrast, Model 4 coefficients reflect the average change in the number of precarious job dimensions, i.e., a coefficient of 1 (or 0.5) indicates an average of one (half) additional precarious dimension in the individual's job.

Our findings reveal a slightly higher likelihood of being in precarious employment among women, around 11 percentage points (p.p.), even after accounting for time and country fixed effects (Table 2). Likewise, gender differences emerge when considering the intensity of precariousness, although the effect size is relatively small, with women experiencing, on average, 0.11 more precarious dimensions. What drives this gender gap? One possible explanation lies in the overrepresentation of women in part-time employment, as well as in involuntary part-time employment (though the latter to a lesser extent in the later) (Eurofound, 2017). Since part-time work is inherently associated with a fewer number of hours worked, using monthly income as the metric tends to increase precariousness among part-time workers, as fewer hours translate into lower monthly wages but not necessarily lower hourly wages. This can widen the gender gap through a composition effect. Nevertheless, the EU-LFS only allows the measurement of income inadequacy via monthly income, as Eurostat provides data solely on monthly incomes from the main job.

Table 2: Marginal effects of socio-demographic and job-related characteristics on the probability of holding a precarious job (incidence) and the number of precarious dimensions (intensity) among employees in EU-27 countries, 2009-2021.

	Probability of holding a precarious job				**Job precariousness intensity**			
	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Coeff.	Sd.	Coeff.	Sd.	Coeff.	Sd.	Coeff.	Sd.
Gender: women	0.111***	(0.001)	0.108***	(0.001)	0.111***	(0.001)	0.113***	(0.001)
Age (ref: 15-19)								
20-24	-0.101***	(0.002)	-0.102***	(0.002)	-0.328***	(0.006)	-0.343***	(0.006)
25-29	-0.137***	(0.001)	-0.136***	(0.001)	-0.511***	(0.005)	-0.527***	(0.005)
30-34	-0.152***	(0.001)	-0.149***	(0.001)	-0.574***	(0.005)	-0.585***	(0.005)
35-39	-0.157***	(0.001)	-0.154***	(0.001)	-0.582***	(0.005)	-0.588***	(0.005)
40-44	-0.162***	(0.001)	-0.157***	(0.001)	-0.579***	(0.005)	-0.579***	(0.005)
45-49	-0.162***	(0.001)	-0.156***	(0.001)	-0.568***	(0.005)	-0.562***	(0.005)
50-54	-0.157***	(0.001)	-0.149***	(0.001)	-0.553***	(0.005)	-0.539***	(0.005)
55-59	-0.145***	(0.001)	-0.135***	(0.001)	-0.53***	(0.005)	-0.506***	(0.005)

60-64	-0.123***	(0.001)	-0.111***	(0.002)	-0.505***	(0.006)	-0.468***	(0.006)
Education (ref: below secondary)								
Secondary	-0.082***	(0.001)	-0.067***	(0.001)	-0.154***	(0.002)	-0.113***	(0.002)
Tertiary	-0.114***	(0.001)	-0.097***	(0.001)	-0.237***	(0.002)	-0.19***	(0.002)
Country of birth: nationals	-0.031***	(0.001)	-0.027***	(0.001)	-0.091***	(0.002)	-0.081***	(0.002)
Tenure	-0.01***	(0.000)	-0.012***	(0.000)	-0.011***	(0.000)	-0.014***	(0.000)
Working from home (ref: never works from home)								
Sometimes working from home	-0.06***	(0.002)	-0.053***	(0.002)	-0.03***	(0.003)	-0.025***	(0.003)
Mainly working from home	-0.024***	(0.002)	-0.018***	(0.002)	0.056***	(0.003)	0.052***	(0.003)
Occupation (ref: low-skilled)								
Medium-skilled	-0.07***	(0.001)	-0.069***	(0.001)	-0.276***	(0.002)	-0.274***	(0.002)
High-skilled	-0.139***	(0.001)	-0.137***	(0.001)	-0.35***	(0.002)	-0.353***	(0.002)
Sector (ref: manufacture)								
Agriculture and extractive	-0.027***	(0.002)	-0.019***	(0.002)	-0.078***	(0.003)	-0.051***	(0.003)
Construction	0.0003	(0.002)	0.001	(0.002)	-0.05***	(0.003)	-0.051***	(0.003)
Mainly private services	0.022***	(0.001)	0.021***	(0.001)	0.067***	(0.002)	0.058***	(0.002)
Mainly public services	0.066***	(0.002)	0.065***	(0.002)	0.09***	(0.002)	0.08***	(0.002)
Country and time fixed-effects			✓	✓			✓	✓
Observations	753,735		753,735		753,713		753,713	
AIC	640,895		629,931					
Adjusted R^2					0.20		0.23	

*Note: * p < 0.05, ** p < 0.01, *** p < 0.001. AIC: Akaike's Information Criteria. Robust errors are used for the models' estimations.*

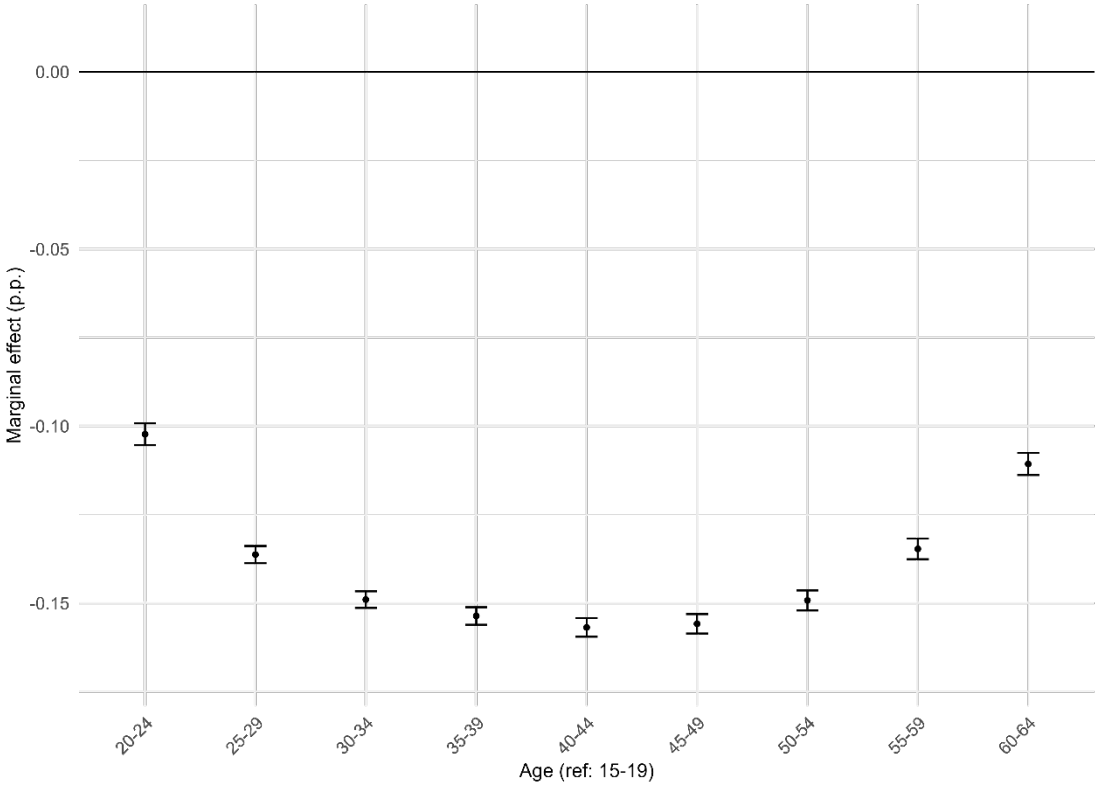
Source: Authors' estimations based on EU-LFS data.

It would be interesting for future research to corroborate whether the gender effect persists if the hourly wages approach is used with other databases. Still, lower monthly incomes carry important consequences, including reduced pension entitlements and an elevated risk of poverty (Grimshaw, 2011). These outcomes align with prior research documenting a persistent gender gap in precariousness employment (Fudge & Owens, 2006; Murillo-Huertas et al., 2023), a disparity that also emerges when assessing the intensity or the number of precarious dimensions within jobs. This greater intensity may result from a combination of a higher incidence of involuntary part-time employment (job security precariousness) and lower monthly wages (financial precariousness) among women, although the gender gap in hourly wages has recently narrowed in EU countries (Orfao et al., 2025).

Regarding age, more pronounced significant effects emerge. The probability of holding a precarious job follows a U-shaped pattern as age increases (Figure 10). In other words, this probability declines as age increases until the age range of 50-54, with a small growth afterwards. For example, individuals aged 20-24 and 40-49 have a lower probability of holding a precarious job than those aged 15-19, around 10 and 16 p.p. lower, respectively. This implies a greater tendency towards precarious jobs among younger individuals, even after controlling for labour market experience, as previously noted by Kretsos (2010) and Orfao et al. (2021); however, there is also an increasing trend in this probability at the older stages (between 55

and 64 years old). Notably, the same trend is observed in the intensity of precariousness: individuals aged 30 to 49 exhibit, on average, 0.58 fewer precarious dimensions compared to those aged 15-19.

Figure 10: Average marginal effects on the probability of holding a precarious job of age categories (ref.:15-19) in EU-27 countries, 2009-2021.



Note: Average marginal effects have been estimated from model 2, which includes time and country fixed effects.

Source: Authors' estimations based on EU-LFS data.

As expected, higher educational attainment reduces both the probability of holding a precarious job and the intensity of precariousness. Specifically, individuals with tertiary education have an 9.7 p.p. lower probability of holding a precarious job and, on average, 0.19 fewer precarious job dimensions compared to those with below secondary education. Furthermore, native-born employees record a lower propensity towards precariousness (3 p.p.) and a lower intensity (0.08 points) than their foreign-born counterparts. Although these findings align with previous studies (Porthé et al., 2009; Pradella & Cillo, 2015), it should be noted that the size of these differences is not very large. Therefore, the greater precariousness observed among the foreign-born population (particularly in Mediterranean countries) may be attributable to compositional effects, for example, having lower education, working in low-skilled occupations or in certain economic sectors.

Beyond these differences linked to the individuals' socio-demographic characteristics, our results also highlight the significance of certain job-related features in explaining precariousness. Job tenure is revealed as a key determinant of precariousness, substantially reducing both its likelihood and intensity. Specifically, an increase in one year of labour market experience leads to a decline in 1 p.p. on the probability of holding a precarious job and a reduction of 0.01 precarious dimensions. Consequently, a 20-year difference in tenure translates into an average reduction of 0.2 precarious dimensions and a 20-p.p. decrease in the likelihood of precarious employment, an effect of considerable magnitude.

The COVID-19 pandemic was associated with a significant increase in telework, leading to both positive effects, such as improved work-life balance, and negative effects, such as reduced social interaction and increased overtime (Eurofound, 2022), including unpaid overtime (Orfao et al., 2024). Therefore, it is relevant to explore whether working from home is linked to a higher or lower propensity towards precariousness. Table 2 shows that while working from home do not significantly increase the likelihood of precariousness (with a negative effect of 1.8 p.p.), it does increase the intensity of precariousness by 0.05 points. The later effect, although not very large, may be explained by a higher incidence of the lack of protection and rights dimension; that is, due to working on weekends, excessive hours, and the lack of decision on working time.

Moreover, using macro-aggregated occupational and sectoral groups as defined by Eurofound (2020), high-skilled occupations are found to be associated with both a lower propensity towards precariousness (by 14 p.p.) and a reduced intensity (by 0.35 points) compared to low-skilled occupations. Additionally, individuals working in predominantly public services have a 6.5 p.p. higher probability of holding a precarious job compared to those in the manufacture sector. In fact, differences between manufacture and other economic sectors remain minimal (around -2 and 2 p.p.). However, these disparities become more pronounced when examining the intensity of precariousness. Specifically, the number of precarious dimensions within jobs in mainly public and private service sectors compared to manufacture are, on average, 0.08 and 0.06 points higher, respectively. The service sector has expanded considerably in recent decades, requiring greater organisational flexibility from firms, particularly in areas such as hospitality, tourism and retail, where extended operating hours often require part-time hours to cover these additional shifts (ILO, 2016), which may lead to a greater incidence of precariousness.

6. Conclusions

The objective of this work was to analyse the recent trends in the incidence and intensity of precariousness across different population groups, sectors and occupations in the EU-27 countries. To that end, a novel Adjusted Multidimensional Precariousness Index has been constructed using data from the EU Labour Force Survey for the period 2009-2021. This index has been decomposed to identify the specific contribution of each dimension to overall precariousness. Moreover, several logistic and linear regression models have been estimated

to explore the determinants of precarious employment and its intensity across Europe. The analysis yields the following main findings on precarious employment trends in Europe.

First, precarious employment varies in both incidence and intensity across EU countries, although a similar evolution is observed across them. Precariousness is predominantly higher in Mediterranean and Nordic countries, with Spain and the Netherlands reporting the highest levels, whereas Continental and Eastern European countries show moderate and low levels, respectively. Notably, the nature of precariousness varies considerably across these groups of countries, in terms of both the dimensions' contribution to overall precariousness and the incidence across population subgroups. In general, the intensity of precariousness remains low to moderate across European countries, with a few exceptions such as Spain, Greece and the Netherlands. Regarding its evolution over time, two distinct patterns can be identified between 2009 and 2021. In many cases, especially in Continental countries, levels remained relatively stable. By contrast, in Greece, Italy, Ireland and the Netherlands, among others, a steady increase is observed following the Great Recession, and a subsequent decline after 2015. While the differences across countries suggest that precariousness is shaped by structural factors of both the economy and the labour market, the evolution over time reflects its cyclical nature, similar to that of the unemployment rate.

Second, cross-country differences partly stem from the varying contribution of each dimension to overall precariousness, with notable similarities within welfare state regimes. Financial precariousness accounts for the largest share in Continental, Eastern, and Central European countries. By contrast, in Mediterranean and Nordic countries, job security precariousness plays a more prominent role, reflecting the widespread incidence of involuntary part-time and temporary jobs. During the period 2009-2015, in general, there was a slight decline in the relative weight of financial precariousness, accompanied by a corresponding increase in the contribution of job security precariousness. From 2016 onwards, however, the opposite trend is observed, which may be attributed to the actions taken by European institutions and national governments to address the rise of precarious and non-standard employment. Interestingly, the downward trend of employment insecurity continued in the majority of European countries in the aftermath of the COVID-19 pandemic and persisted through to 2023.

Thirdly, precariousness has been revealed as a complex phenomenon shaped by the interplay of multiple socio-demographic and job-related factors. The results indicate that women, individuals with lower levels of educational attainment, and foreign-born employees exhibit a higher likelihood of holding a precarious job and face more precarious job conditions. Moreover, precariousness appears to be, at least in part, a transitory phase within individuals' labour careers, as younger people are more exposed to the risk of holding a precarious job and accumulating job deficiencies compared to adults. Job tenure also plays a critical role, as it significantly reduces both the probability and intensity of precarious employment. Lastly, precarious jobs are more common across certain occupational and sectoral groups, particularly in low-skilled occupations and in services sectors where firms require a higher degree of organisational flexibility.

These findings carry important implications for policymaking at both the European and national levels. The positive developments in reducing labour market precariousness underscore the effectiveness of efforts made by these institutions. This is particularly evident in the significant changes observed in the dimension of job insecurity, which has recorded the largest decline since 2015. This improvement has been further supported by the economic expansion experienced across Europe. At the same time, the continued prominence of low wages as main contributor to overall precariousness in the bulk of European countries should be underlined. This remains a key challenge that could be partially mitigated through the reinforcement of minimum wage policies. Also, while education remains crucial in providing access to higher-quality jobs and to occupations that are less prone to precarious conditions, job tenure has emerged as a central factor when analysing precarious employment. Ensuring a smooth transition from education to the labour market can therefore help reduce the risk of experiencing precarious employment at more advanced ages, as observed in Nordic countries.

The significant age-related differences observed in precarious employment reveal the vulnerable position of young people, particularly in the Nordic countries and in certain Mediterranean countries such as Spain, where a widening gap between younger and older employees is becoming increasingly evident. Nonetheless, there are ways to mitigate labour precariousness over the course of working life. This is illustrated by the very low levels of precariousness among the adult population in Nordic countries, where precariousness is not persistent throughout the career but rather tend to be transitory. Some countries in this group, such as Denmark and the Netherlands, which are characterised by a high incidence of non-standard employment (particularly part-time work), also allocate significant resources to active labour market policies that facilitate rapid reintegration into the labour market. Therefore, it is also crucial not to analyse precariousness in isolation, but to consider the broader labour market context, including both unemployment and inactivity rates.

The persistent gender differences observed may be driven by compositional effects, such as the overrepresentation of women in part-time employment, their concentration in specific sectors such as retail, or lower levels of accumulated work experience resulting from career interruptions linked to family responsibilities. In this context, the integration of labour market policies with social and family-oriented measures may play a crucial role in addressing the persistent gender gap. It is worth noting, however, that this gap has narrowed in most European countries between 2009 and 2021, indicating a positive trend towards greater gender equity.

Finally, one of the major challenges still facing the European Union is to address not only the incidence but, more importantly, the high intensity of precariousness in the service sectors. In these sectors, firms require high levels of flexibility to adapt to shifting labour demands. Consequently, the challenge lies in ensuring that this flexibility does not come at the expense of more precarious working conditions. It is also important to highlight that part-time and temporary jobs can facilitate transitions toward full-time and permanent employment. Nevertheless, targeted actions are needed to reduce those forms of non-standard employment that may lead to dead-end situations (such as involuntary non-standard

employment and marginal part-time jobs). These types of arrangements can be beneficial in helping employees meet operational needs and, for example, in enabling young people to balance work and education or adults to manage work alongside household responsibilities. Still, they may also generate insecurity among individuals. For this reason, it is essential to provide strong protection and support in the event of job termination, as well as mechanisms to ensure rapid reintegration into the labour market in order to prevent prolonged periods of unemployment or inactivity.

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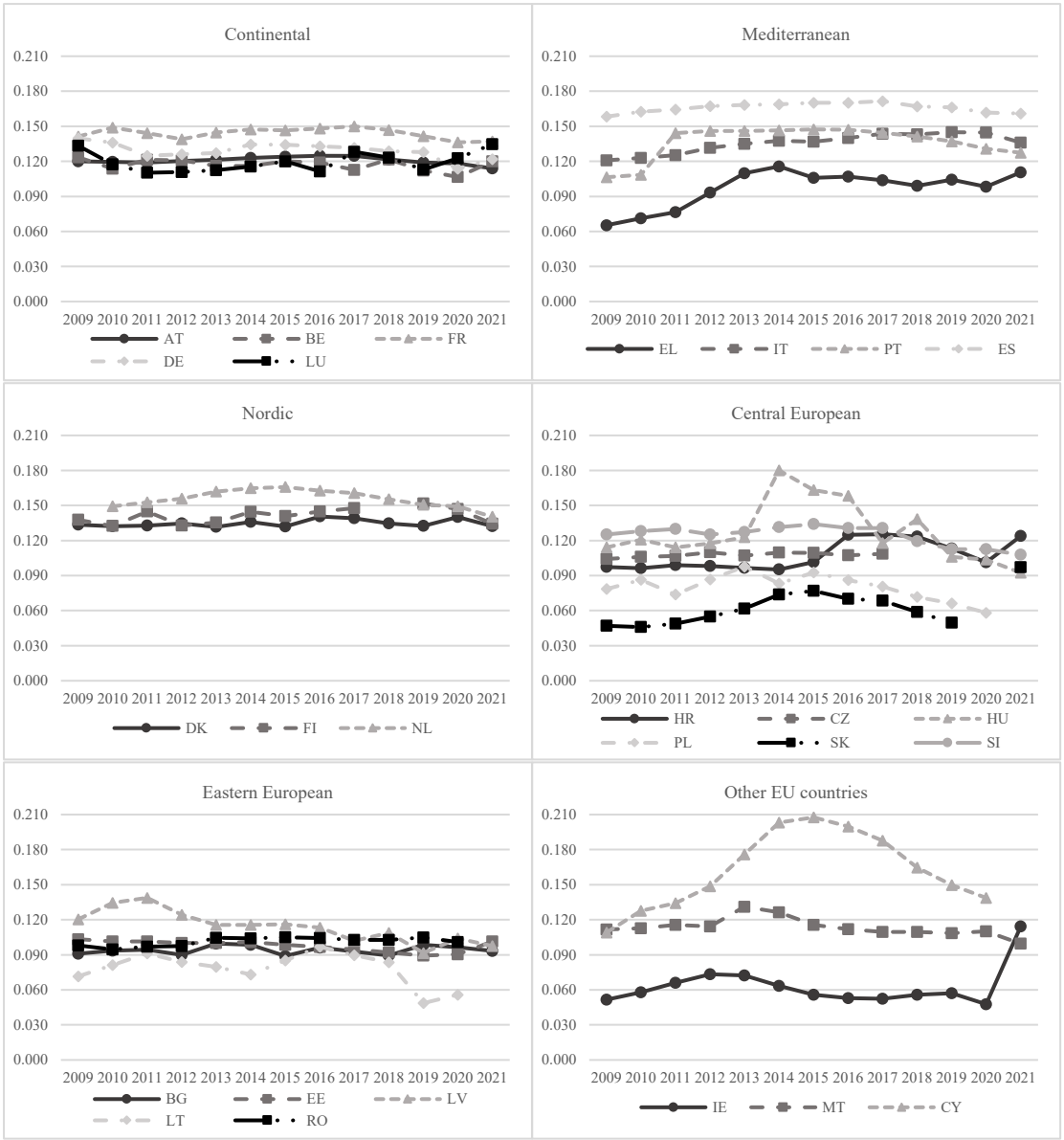
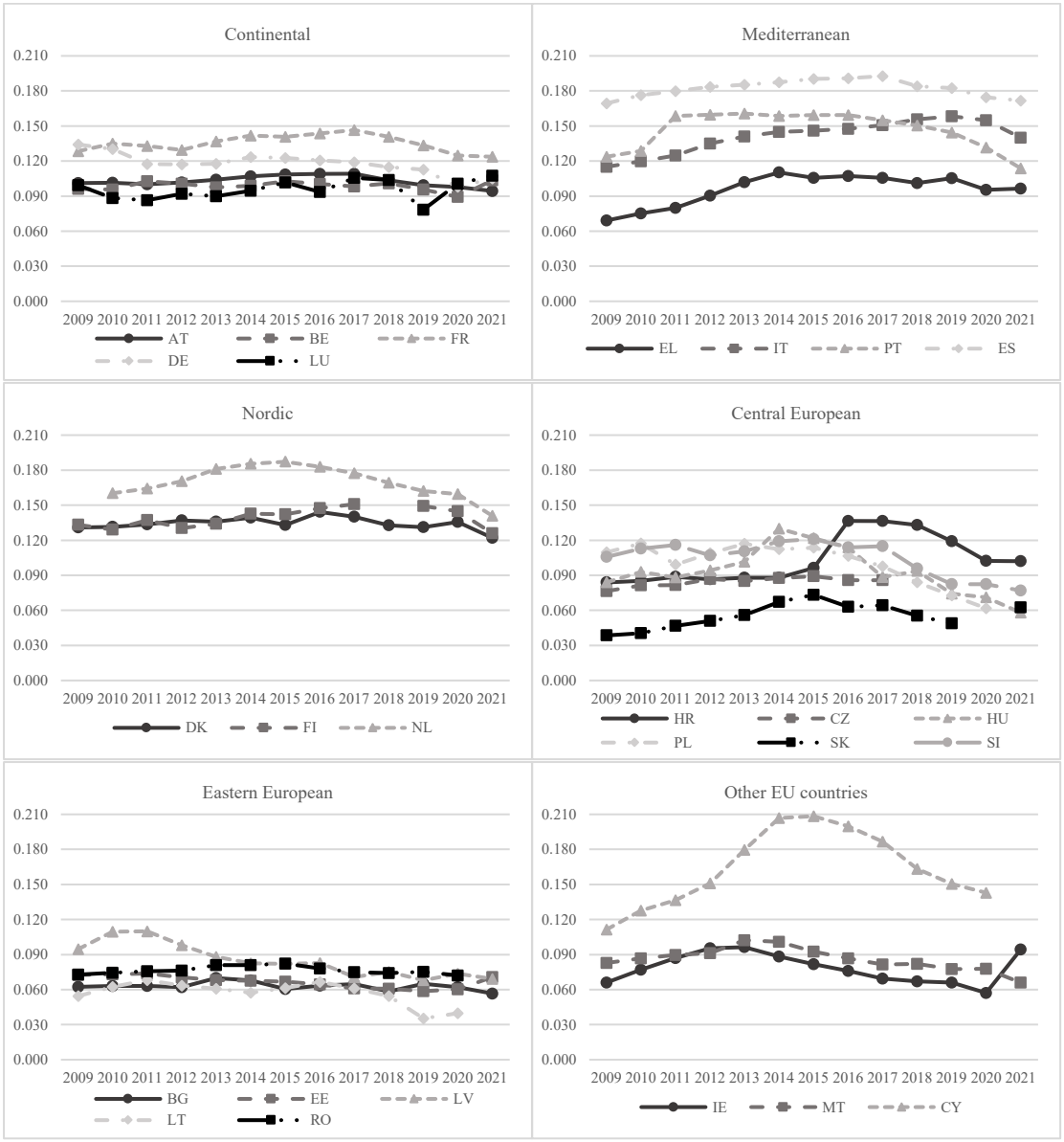
APPENDIX

Figure A1: Robustness test of the Adjusted Multidimensional Precariousness Index (AMPI) using a weight of 2 for the income inadequacy dimension. Results across EU-27 countries by welfare state groups, 2009-2021.



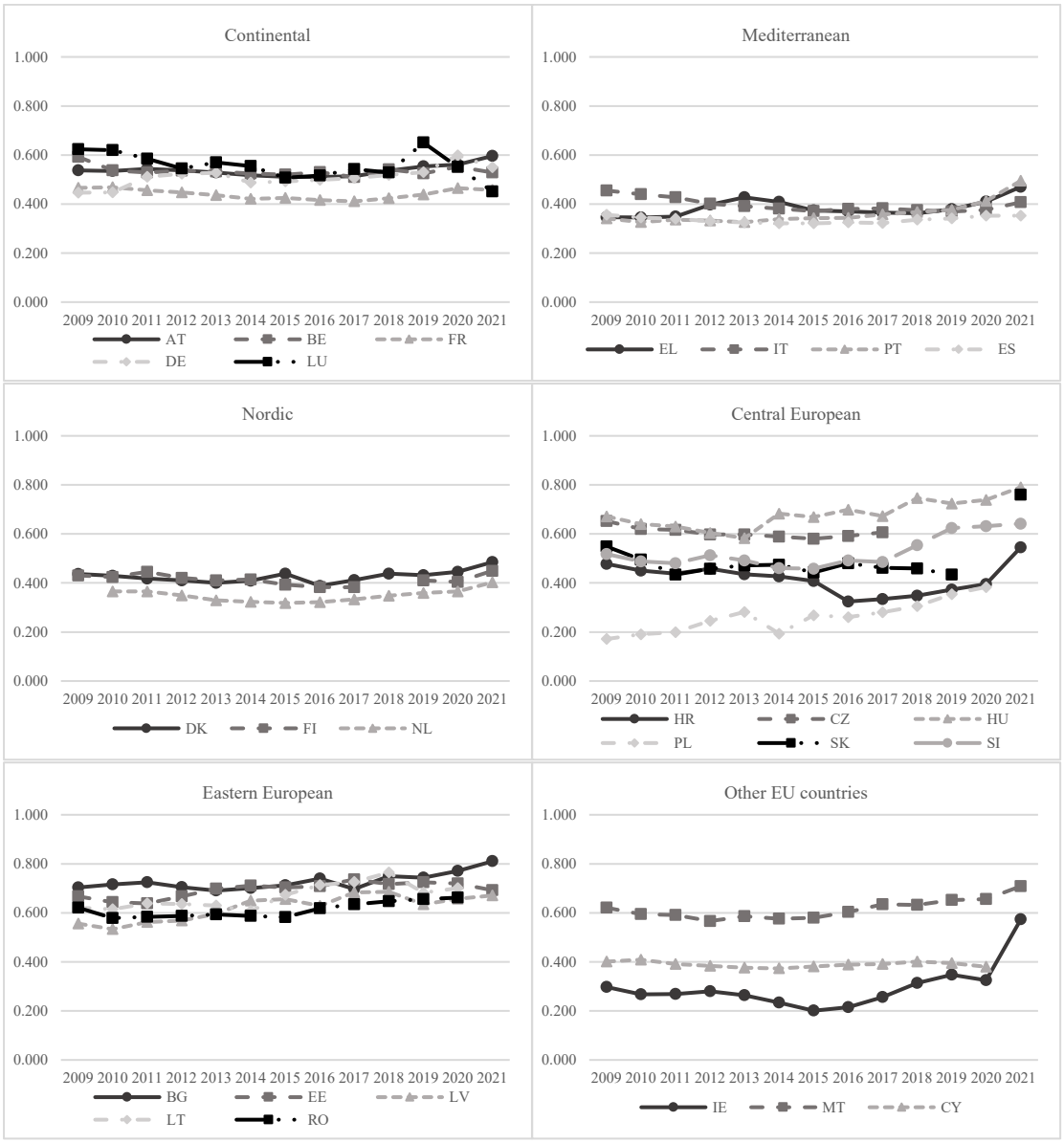
Source: Authors' estimations based on EU-LFS data.

Figure A2: Robustness test of the Adjusted Multidimensional Precariousness Index (AMPI) using a weight of 2 for the employment insecurity dimension. Results across EU-27 countries by welfare state groups, 2009-2021.



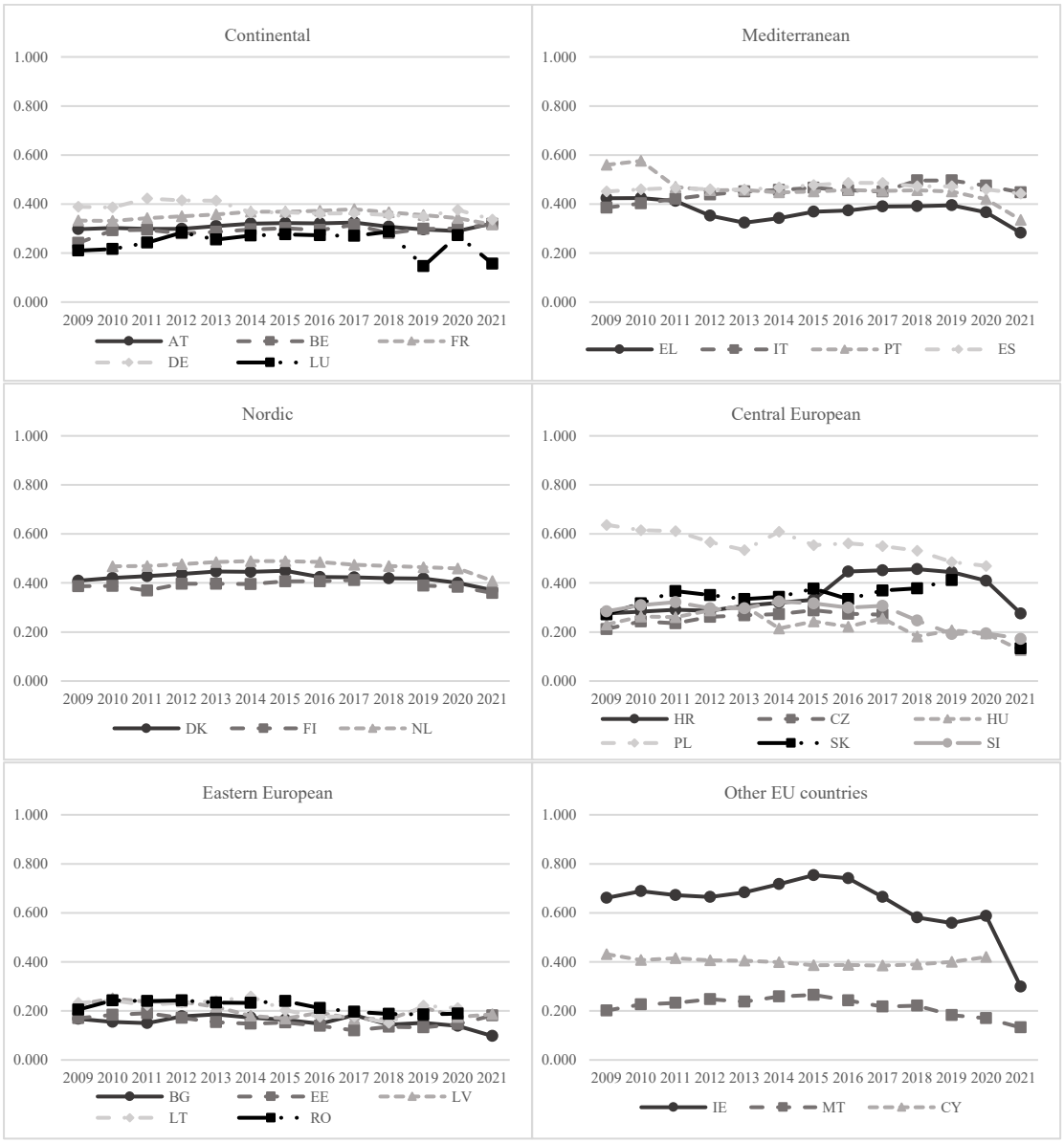
Source: Authors' estimations based on EU-LFS data.

Figure A3: Relative contribution of income inadequacy to overall precariousness across EU-27 countries by welfare state groups, 2009-2021.



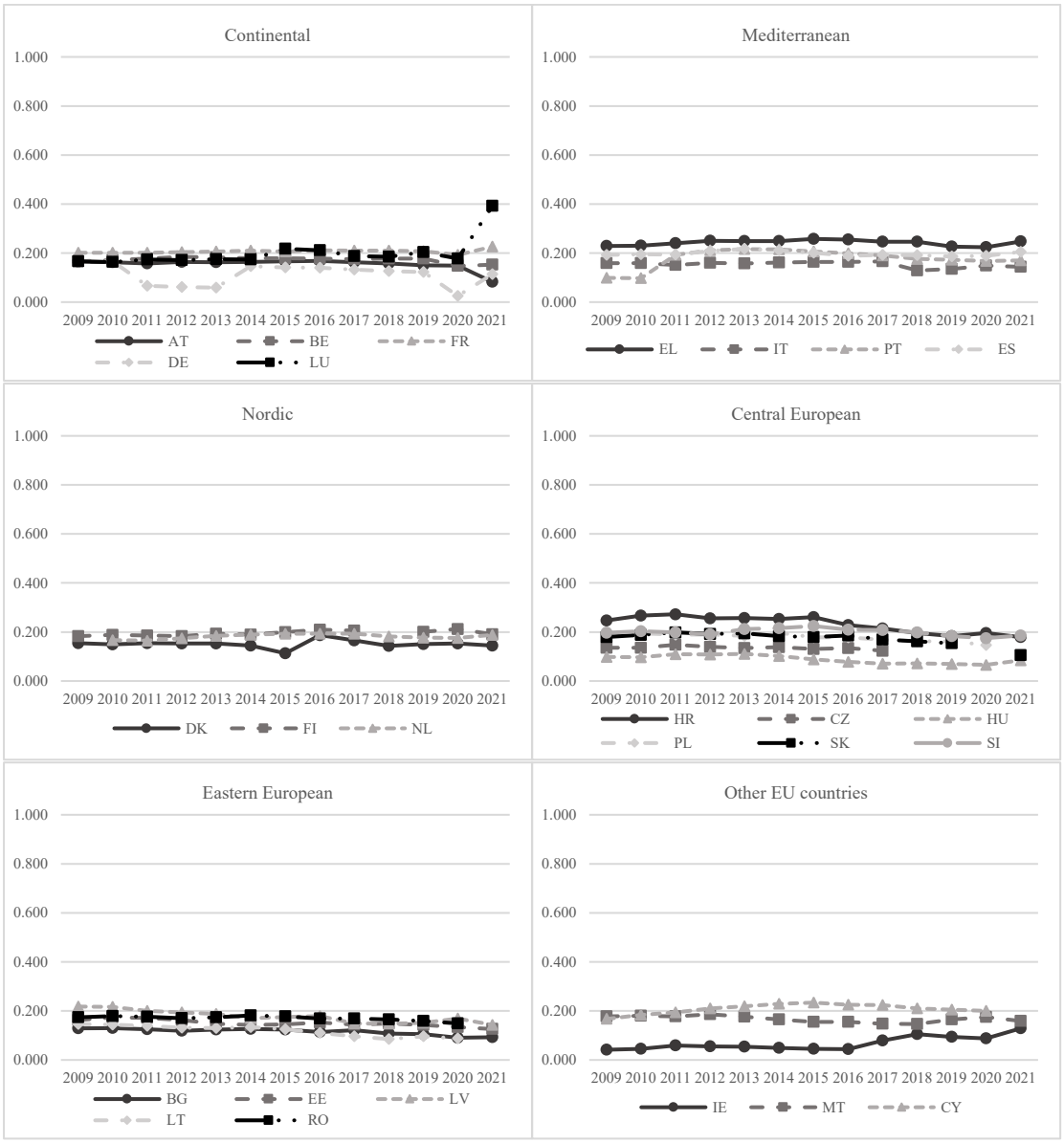
Source: Authors' estimations based on EU-LFS data.

Figure A4: Relative contribution of employment insecurity to overall precariousness across EU-27 countries by welfare state groups, 2009-2021.



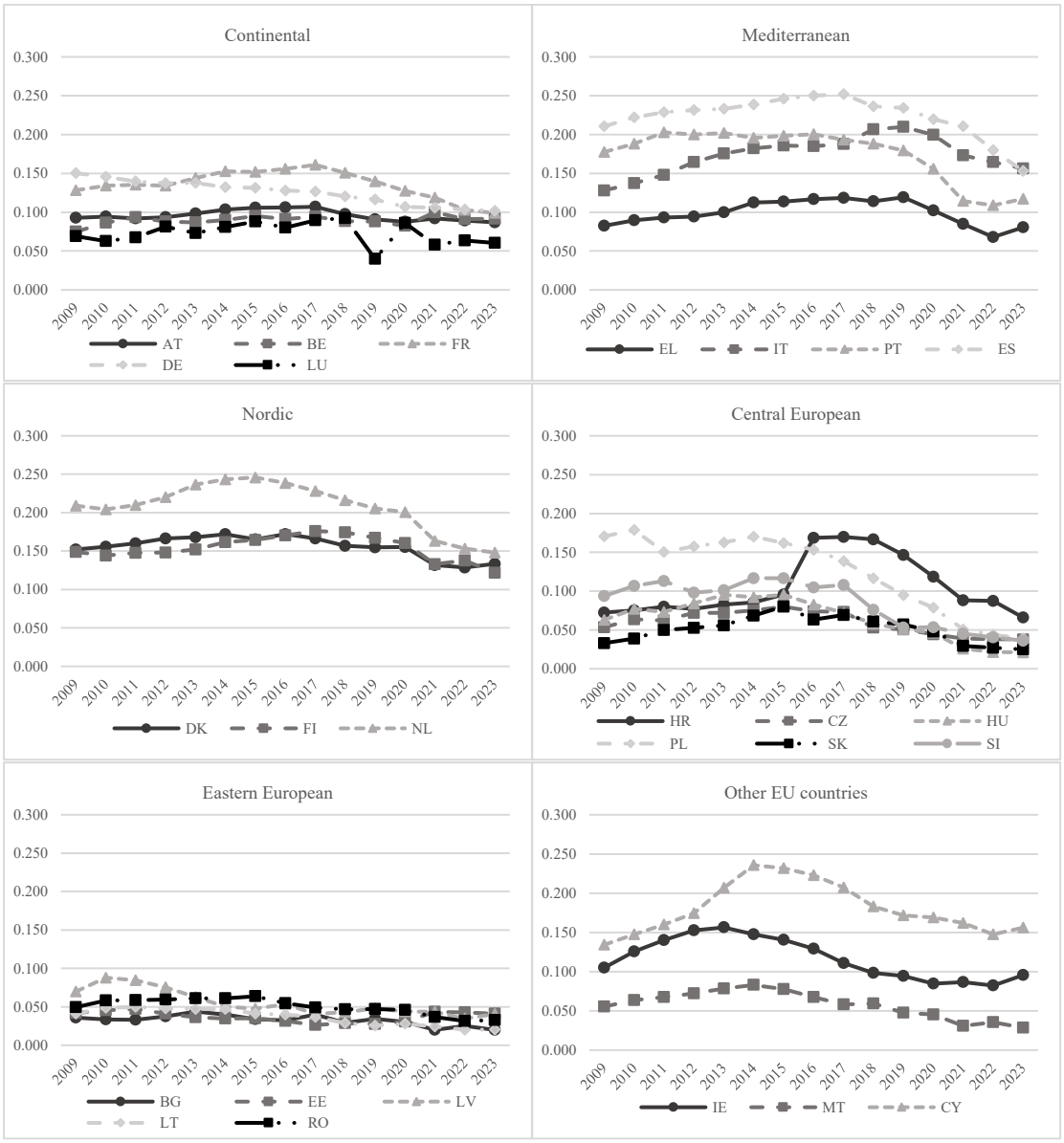
Source: Authors' estimations based on EU-LFS data.

Figure A5: Relative contribution of lack of protection and rights to overall precariousness across EU-27 countries by welfare state groups, 2009-2021.



Source: Authors' estimations based on EU-LFS data.

Figure A6: Incidence of the employment insecurity dimension across EU-27 countries by welfare state groups, 2009-2023.



Source: Authors' estimations based on EU-LFS data.

Table A1: Adjusted Multidimensional Precariousness Index (AMPI) by economic sectors across EU-27 countries, 2009-2021.

Welfare state model	Country	Agriculture and extractive		Manufacture		Construction		Mainly private services		Mainly public services	
		2009	2021	2009	2021	2009	2021	2009	2021	2009	2021
Continental	Austria	0.059	0.066	0.058	0.050	0.066	0.053	0.137	0.123	0.094	0.095
	Belgium	0.066	0.068	0.054	0.064	0.036	0.041	0.112	0.113	0.134	0.123
	France	0.083	0.087	0.065	0.076	0.066	0.069	0.132	0.127	0.170	0.156
	Germany	0.094	0.105	0.066	0.039	0.066	0.043	0.168	0.140	0.135	0.115
	Luxembourg	0.019	0.246	0.070	0.088	0.122	0.140	0.110	0.128	0.121	0.118
Mediterranean	Greece	0.041	0.053	0.047	0.070	0.065	0.112	0.064	0.126	0.087	0.086
	Italy	0.188	0.201	0.066	0.064	0.065	0.075	0.124	0.151	0.131	0.146
	Portugal	0.090	0.135	0.101	0.106	0.091	0.083	0.108	0.115	0.117	0.121
	Spain	0.213	0.197	0.083	0.082	0.128	0.098	0.162	0.171	0.188	0.186
Nordic	Denmark	0.088	0.113	0.067	0.057	0.069	0.048	0.161	0.160	0.113	0.099
	Finland	0.088	0.122	0.059	0.059	0.053	0.041	0.158	0.156	0.147	0.124
	Netherlands	0.132*	0.144	0.081*	0.065	0.047*	0.040	0.198*	0.172	0.120*	0.096
Central European	Croatia	0.106	0.080	0.110	0.106	0.099	0.094	0.089	0.126	0.042	0.082
	Hungary	0.115	0.085	0.093	0.033	0.084	0.085	0.088	0.078	0.093	0.080
	Slovakia	0.038	0.079	0.034	0.052	0.017	0.054	0.039	0.097	0.063	0.070
	Slovenia	0.079	0.052	0.093	0.063	0.104	0.093	0.141	0.112	0.081	0.075
Eastern European	Bulgaria	0.105	0.117	0.074	0.073	0.053	0.059	0.065	0.068	0.077	0.051
	Estonia	0.081	0.079	0.070	0.047	0.063	0.062	0.098	0.097	0.072	0.080
	Latvia	0.166	0.076	0.119	0.063	0.089	0.052	0.100	0.090	0.077	0.074
Other countries	Ireland	0.022	0.079	0.020	0.043	0.026	0.040	0.066	0.126	0.058	0.086
	Malta	0.074	0.069	0.073	0.061	0.074	0.064	0.111	0.093	0.074	0.058

*Note: *Due to the unavailability of 2009 data for the Netherlands, the values reported for that year refer to 2010. The Czech Republic, Poland, Lithuania, Romania and Cyprus are not included in this table due to the unavailability of data for 2021.*

Source: Authors' estimations based on EU-LFS data.

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