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Employment Cyclicity in the EU Financial Sector from a Gender Perspective

Abstract

The article analyses the procyclical nature of employment in the financial sector of EU countries (2008–2024), focusing on how economic fluctuations affect job stability among men and women. Extending existing research on cyclical sensitivity, it incorporates the concepts of labour market hysteresis and crisis scarring. Using hierarchical cluster analysis (HAC) and spectral time series analysis, the study identifies three groups of countries differing in employment stability and exposure to economic cycles. Results reveal notable gender asymmetries: men are more responsive to abrupt fluctuations, while women display slightly higher stability, though still subject to cyclical pressures. Cross-country differences in fluctuation patterns reflect institutional and technological factors, including regulatory intensity and historical legacies. The findings indicate that employment cycles vary not only in magnitude but also in persistence across genders and national contexts, highlighting structural vulnerabilities. These insights advance understanding of labour market resilience and support the formulation of gender-sensitive employment policies in times of economic turbulence.

Keywords

employment | cyclicity | financial sector

JEL Codes

J21, J31, E32

1. Introduction

The evolving economic and social context of the European Union has made employment a key focus for both policymakers and researchers (Karamessini & Rubery, 2014; Kolade & Cichocki et al., 2017; Kolade & Owoseni, 2022). A central objective of European socio-economic policy is to achieve an employment rate of 78% in the 20–64 age group by 2030, reflecting the growing importance of labour market participation in the development strategies of EU member states (Eurostat, 2024; European Commission, 2025b). This upward trend is already evident, with the employment rate reaching 75.3% in 2023. However, to fully understand the dynamics and directions of change in

the European labour market, it is essential to consider not only the procyclicality of employment in relation to economic conditions (Drozdowicz-Bieć, 2006) but also to analyse employment within the context of sectoral differences, business size, and the degree of technological advancement (Stoycheva, 2019).

The financial sector serves both as a ‘driving force’ for investment and as an area highly susceptible to economic fluctuations. During global economic crises, such as the 2008 financial crisis, banks and financial institutions experienced slowdowns that led to reductions in employment (Johnstone et al., 2019). At the same time, the sector is characterised by pronounced gender segregation and the so-called ‘glass ceiling’, which hinders women’s advancement to the

highest levels of managerial hierarchy (Cech & Blair-Loy, 2010; Saranya et al., 2014). Despite numerous studies on restructuring processes (Claessens et al., 2007; Detzer et al., 2017; Shaikh et al., 2017) and the role of the financial sector in the economy (Firlej & Stanuch, 2020 ; Feyen et al., 2021; Balina & Idasz-Balina, 2023), there is a lack of in-depth comparative research on how economic fluctuations influence the dynamics of employment for men and women in this sector. This research gap is especially relevant given the increasing technological transformation and sectoral volatility across EU economies. Moreover, research emphasises that the effects of economic shocks on employment may be persistent rather than temporary, a phenomenon known as hysteresis (Bluedorn & Leigh, 2019; Cerra et al., 2020). This concept highlights how downturns can cause long-term 'scars' in the labour market, including discouragement effects, skill depreciation, and institutional rigidities, which may disproportionately affect women. These lasting effects may explain why employment recovery does not always follow economic recovery – especially in sectors like finance, which are prone to structural shifts and automation.

This study covers data from 2008 to 2024 for selected EU member states and focuses on determining the impact of macroeconomic changes on employment in the financial sector, with a particular emphasis on gender differences. Methodologically, a multifaceted approach has been applied: hierarchical cluster analysis (HAC) to identify countries with similar labour market dynamics, and spectral time series analysis to capture cyclical employment fluctuations. In addition to statistical analyses, the study incorporates a qualitative perspective, taking into account factors influencing employment changes in the labour market, such as automation, socio-economic events, and legal regulations.

The article is organised as follows. The Literature review discusses the key determinants of employment in the financial sector and highlights existing research gaps. The Data and research methodology section describes the data sources and analytical procedures, including hierarchical cluster analysis and spectral time-series analysis. The Results and discussion section presents the empirical findings, with particular attention to gender-based differences in employment cyclicalities and cross-country patterns. Finally, the Conclusions summarise the main insights, outline policy implications, and indicate directions for future research.

2. Literature Review

One of the key objectives of the European Union for 2030 is to achieve an employment rate of 78%. This indicator is calculated as the ratio of employed individuals to the total population in the 20–64 age group. In 2023, the number of employed people aged 20–64 in the EU reached 195,708,000, accounting for 75.3% of the total population in this age group. As a result, the employment rate is gradually approaching the target set by the EU, rising from 70.9% in 2017 to 75.3% in 2023 (Eurostat, 2024).

Changes in employment in the labour market are procyclical, which means that economic growth increases the demand for goods and services, thereby leading to a rise in the number of jobs (Drozdowicz-Bieć, 2006). While employment is typically considered procyclical, a substantial body of research highlights that economic shocks may have persistent effects on employment levels, a phenomenon described as hysteresis (Ball et al., 2017). These effects include long-term declines in participation, skill mismatches, and gendered disadvantages, particularly in post-crisis economies. Businesses in the growth phase expand their production, which requires hiring new employees, resulting in improved employment indicators and lower unemployment levels. Conversely, during an economic slowdown, employment declines, and the number of jobs decreases in response to falling demand, increased uncertainty, and more challenging financial conditions (Cichocki et al., 2015). However, there is a noticeable lag in the occurrence of these changes in the labour market relative to shifts in overall economic activity (OECD, 2021). This means that employers make decisions regarding recruitment or layoffs with some delay compared to changes in GDP or investment levels. The cause of this phenomenon is usually the conservative stance of businesses, which prefer to ensure that economic growth is sustained before deciding to increase employment (IMF, 2020).

When analysing employment in the labour market, in addition to its cyclicalities, it is also necessary to consider its structural diversity, which is reflected in different economic sectors (Stoycheva, 2019). The European classification of economic activities (NACE) distinguishes 22 areas of economic activity which includes, among others (European Commission, 2008): A- agriculture, forestry, and fishing; C-manufacturing; F-construction; G-wholesale and retail trade; repair of motor vehicles and motorcycles; K-financial and insurance

activities; M-professional, scientific, and technical activities; O-public administration and defence; compulsory social security; Q-education; T-activities of households as employers; undifferentiated goods and services producing activities of households for own use. Financial activities play a key role in the European economy, constituting an essential element of economic growth, macroeconomic stability, and market integration (Mihaylova-Borisova, 2024). This sector serves as the main financing channel for businesses and households, enabling capital allocation and risk management through developed financial markets and commercial banks (Villar Burke et al., 2015). European financial centres, such as Frankfurt, Luxembourg, and Amsterdam, play a significant role in the global economy, facilitating international transactions and serving as hubs for asset management (Florczak, 2020). Additionally, the financial sector in Europe is characterised by a high level of regulation, which ensures stability but also affects market dynamics and its ability to absorb financial shocks (Alexiou et al., 2018). Employment in this sector is influenced by numerous structural, historical, and political-economic factors that determine resource allocation, wage levels, and growth prospects for specific industries (World Bank, 2019), as well as economic fluctuations, which pro-cyclically affect companies' decisions regarding workforce expansion or reduction (Cichocki et al., 2015).

Structural factors affecting employment include elements that influence wage disparities, productivity, and resource allocation across sectors. To analyse wage inequality from this perspective, it is important to consider that wage differences between occupations result from social relations disparities in earnings are linked to social dynamics and the balance of power in professional relationships. The strength of an occupation partly derives from its position within the economic system and production relations, the role of a profession in the economic structure determines its importance and ability to generate higher wages, while resource asymmetry favours occupations with structural advantages. Professions that have greater resources or access to them gain an advantage, leading to better working conditions and higher salaries (Gorman & Sandefur, 2011). Technological development plays a significant role among the structural factors affecting employment (Kolade & Owoseni, 2022). This is due to its high flexibility and the unique ways in which it has increased the mobility of capital and labour (Garcia-Murillo et al., 2018). As technology advances and the costs of new

technologies such as robotics and other autonomous systems decrease, productivity rises, leading to scenarios where employees are either dismissed, forced to accept lower wages due to increased job competition (Boyd & Huettinger, 2019), or required to retrain to take advantage of new job opportunities that involve human-robot collaboration (Novakova, 2020). Information technologies not only affect employment in existing businesses but also contribute to job creation in new firms, particularly in areas such as data analytics, cloud computing, streaming services, and cybersecurity (Centre for the New Economy and Society, 2018; Garcia-Murillo et al., 2018). One of the elements related to information and communication technologies that significantly impacts labour market disparities is the digitalisation of processes. Highly routine tasks are particularly at risk of automation, leading to a reduction in the number of necessary workers and their wages. At the same time, highly skilled workers maintain their positions in high-value-added sectors (Autor & Dorn, 2013). Such process automation significantly influences employment cyclicity. The development of advanced technologies allows businesses to substantially increase efficiency and reduce costs, which may also delay employment growth during periods of economic expansion. In recovery phases, so-called 'jobless recoveries' may occur, meaning that improvements in macroeconomic indicators do not immediately lead to job creation due to factors such as process automation or production reorganisation (Ball et al., 2017).

The second group of factors influencing the size and quality of employment consists of historical factors such as transformation (Karlik, 2015) and economic crises (Chung & Van Oorschot, 2011). The transformation of 1989, associated with the collapse of communist regions in Central and Eastern Europe and the transition from centrally planned economies to market systems, led to significant structural changes in employment (Karlik, 2015). This period was characterised by an initial economic slowdown resulting from 'shock therapy' and the closure of many unprofitable state-owned enterprises. As a result, unemployment rose sharply, and the labour market struggled to absorb dismissed workers (Kamińska, 2021). Over the following decade, however, market reforms, foreign investment and deeper integration with the EU gradually fostered economic recovery and sectoral reallocation (Roaf et al., 2014; Cichocki et al., 2017). By contrast, Western European economies were not directly affected by this transformation but later faced a different shock which spilled over

to the entire EU and further reshaped employment dynamics. The Global Financial Crisis of 2008 significantly contributed to employment declines, particularly among low-skilled workers (Johnstone et al., 2019; Guo & Sell, 2021). During the crisis, most developed economies experienced a severe slowdown, and many countries entered a recession (defined as a period of at least two consecutive quarters of negative GDP growth). Among women and young people, the unemployment rate in some European countries reached around 50% (Karamessini et al., 2019). These groups were often employed in low-paid or temporary jobs (Eurofound, 2013). Although economic recovery followed the worst phase of the crisis, in many countries was slow and unstable, with persistent labour market challenges (Węc, 2020). In some cases, however, these changes may reflect not just unemployment but occupational or sectoral reallocation, especially among more mobile or highly skilled workers. Despite its negative impact on employment, the crisis accelerated structural changes in the European economy, increasing the importance of sectors related to digital technologies and renewable energy (Pfarl & Bellak, 2018). During both the economic crisis and the transformation, labour market policies and programmes aimed at supporting workforce activation and reducing employment inequalities played a crucial role (Rutkowski, 2006; Sharma & Winkler, 2018).

The financial sector is, on the one hand, perceived as a 'male domain' due to the association of required competencies such as risk-taking, aggressive negotiation, and high competitiveness with stereotypically 'masculine' traits (Bertrand et al., 2010). On the other hand, recent decades have seen an increase in women's participation in finance-related professions, particularly in administrative and service-oriented roles. The historical dominance of men in key decision-making areas and top management positions has resulted in limited access for women to senior roles and the persistence of the so-called 'glass ceiling' in this sector (Cech & Blair-Loy, 2010; Saranya et al., 2014). This concept highlights that even with similar qualifications and professional experience, women more often face institutional resistance and gender stereotypes, which influence their perception as less competent in demanding or high-risk professional roles (Begeny et al., 2020). This is linked to the perception that senior positions in finance require long working hours, high stress levels, constant availability, and the ability to respond quickly to market changes. As a result, the 'ideal

employee' is expected to be fully available for work, without constraints such as caregiving responsibilities outside the workplace (Cech & Blair-Loy, 2010). The increase in women's participation in finance-related professions, particularly in administrative and service-oriented roles, is associated with their classification as 'feminine-coded' jobs. These are roles where organisational culture allows for a balance between the socially expected family life of women and their professional careers (Merma-Molina et al., 2021). However, such roles tend to have lower social prestige and weaker career advancement prospects, with career progression being limited from an early stage (Begeny et al., 2020). These positions may also provide a degree of employment continuity during economic downturns, as they are often located in less volatile operational areas of the sector. Studies suggest that occupational segregation can have both protective and limiting effects depending on the broader economic context (O'Dwyer & Richards, 2021).

Employment cyclicalities can become a factor that deepens these differences. Changes in employment cycles may affect women and men differently, either exacerbating or mitigating existing gender inequalities. This is partly because women are more often employed under flexible contracts (e.g., part-time work) and in sectors more vulnerable to demand fluctuations (e.g., services, retail trade). During recessions, employers often first reduce short-term or 'flexible' positions, which in practice affects women more frequently (Karamessini & Rubery, 2014; Alon et al., 2021). On the other hand, during periods of dynamic economic recovery, when labour demand rises sharply, women may have greater opportunities for faster entry or re-entry into the labour market, especially in service sectors (e.g., education, care, retail), which often experience labour shortages. However, the growth of female employment is often constrained by structural barriers, such as wage disparities or the insufficient availability of care services and flexible working arrangements (World Bank, 2019).

To ensure equal opportunities and the overall stability of employment in the labour market, the European Union implements jurisprudence, legislation, and treaty amendments aimed at maintaining equal chances in the workplace (European Commission. Statistical Office of the European Union., 2024). In 2017, the European Pillar of Social Rights was established, defining standards for gender equality, fair wages, access to education, and social protection. The pillar promotes the

integration of marginalised groups, including women, people with disabilities, and migrants (European Parliament (2016/2095(INI)), 2017). Beyond this broad framework, the EU also implements targeted strategies and programmes addressing specific aspects of labour market inequalities. The European Disability Strategy 2021–2030 supports the integration of people with disabilities by creating accessible workplaces and combating workplace discrimination (European Commission, 2021b). To support youth employment, the EU has introduced the Youth Guarantee, which provides training, apprenticeships, and job opportunities through the European Social Fund Plus (European Commission, 2021a). The principle of equal pay for men and women for the same work was incorporated into EU treaties as early as 1957 (European Parliament, 2024). Linked to this principle, the Gender Equality Strategy 2020–2025 focuses on reducing the gender pay gap and increasing female participation in male-dominated professions (European Commission, 2020). The EU also emphasises gender equality in corporate governance, advocating for greater female representation in leadership roles. A directive on this matter was adopted by the European Parliament and the Council in 2022¹ mandates that by 2026, at least 40% of board seats in large companies must be held by women (European Commission, 2025a).

3. Data and Research Methodology

This study applies a multidimensional research approach combining both quantitative and qualitative methods to analyze gendered employment dynamics in the financial sector across EU countries. First, an examination of employment policies implemented in various countries was carried out, with particular emphasis on gender equality regulations, flexible employment arrangements, and strategies for mitigating unemployment during economic downturns. This was achieved through a review of reports from the European Commission, the OECD, and the International Labour Organization (ILO). Next, statistical data on employment in the financial sector across EU countries from 2008 to 2024 were

utilised. These data covered both employees and self-employed individuals engaged in productive activities within the boundaries of the NACE Rev.2 classification system in the selected countries based on data availability throughout the full period² (Eurostat, 2024). The results of individual time series were subsequently applied in further statistical methods. The analysis covers the period from 2008 to 2024, beginning with the onset of the global financial crisis, a critical point for structural and employment shifts in the financial sector. This time frame also coincides with the adoption of the harmonised NACE Rev.2 classification in Eurostat, which ensures full comparability of sector-specific data across countries. The final country sample includes only those EU member states for which complete and consistent employment data disaggregated by gender were available throughout the entire period. As a result, some countries with incomplete records (e.g., Germany, Malta) were excluded from the analysis. Initially, hierarchical cluster analysis (HAC) was employed to identify groups of countries exhibiting similar employment dynamics in the financial sector. The analysis was based on two variables: the average level of employment and the standard deviation of year-on-year changes in employment over the 2008–2024 period. These indicators capture both the scale and volatility of employment trends. Euclidean distance was used alongside Ward's method, which minimises total within-cluster variance and ensures the formation of compact and internally coherent clusters a common and effective approach in economic and labour market analyses (Majerova & Nevima, 2017; Chlebisz & Mierzejewski, 2019; Kubala, 2019; Dmytrów & Bieszk-Stolorz, 2021). Compared to other linkage methods (e.g., single, complete), Ward's approach avoids distortion in the presence of outliers and uneven group sizes. A three-cluster solution was adopted for methodological consistency and enhancement of results. More granular segmentation reduced analytical clarity and introduced noise, whereas grouping countries into three categories allowed for a clearer comparison of employment cyclical patterns and more meaningful policy insights. For transparency, the complete amalgamation (linkage) schedule underpinning the

¹ DIRECTIVE (EU) 2022/2381 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 November 2022 on improving the gender balance among directors of listed companies and related measures (Text with EEA relevance)

² The countries included in the analysis are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.

three-cluster solution (Ward's method, Euclidean distance) is available from the authors upon request, allowing independent assessment of linkage distances and candidate solutions.

The spectral analysis was conducted separately for men and women, enabling a comparison of the sensitivity of each group to economic fluctuations. The spectral density measure was used to assess the impact of specific frequencies on overall employment dynamics, where higher values indicated a stronger contribution of those frequencies to the overall series. Although frequency analysis using the Fourier transform is primarily applied in the natural sciences, it has also been used in economics, particularly in the study of cyclical phenomena (Harvey, 1975; Maruyama, 2018), including business cycles (Mierzejewski, 2019; Mierzejewski, 2024) and labour markets (Skare & Buterin, 2015; Simonova & Galiullin, 2015; Mierzejewski & Palimąka, 2019).

4. Results and Discussion

In most developed economies, employment in the financial sector tends to move in line with economic cycles, although the speed and direction of adjustment vary depending on institutional arrangements, technological adaptability, and sectoral structure (Drozdowicz-Bieć, 2006; Stremmel, 2015). At the same time, the growing influence of automation and digitalisation may amplify or delay these dynamics, contributing to divergent employment responses between and within countries (Kolade & Owoseni, 2022).

Building on these observations, the following section presents an empirical examination of employment cyclicity in the financial sectors of selected EU countries. First, the results of hierarchical clustering are used to identify distinct country groups based on employment fluctuation patterns. This is followed by a spectral analysis of gender-disaggregated time series, which offer insights into the frequency and persistence of employment changes among men and women.

Figure 1 presents the dendrogram resulting from the HAC procedure, illustrating how countries were grouped based on similarities in employment level and variability in the financial sector between 2008 and 2024. The analysis of the dendrogram (Figure 1) enabled the identification of three groups of

European countries with varying levels and dynamics of employment in the financial services sector between 2008 and 2024. The first group (A) includes countries with a stable labour market in this sector (Austria, France, Greece, Ireland, Norway, Cyprus, Czechia), the second group (B) consists of countries with moderate changes (Bulgaria, Finland, Hungary, Poland), while the third group (C) comprises nations with the highest volatility and a dynamic labour market (Belgium, Denmark, Italy, Luxembourg, the Netherlands, Portugal). The horizontal axis represents the distance measure between groups, calculated using the formula $(Dlink / Dmax) \times 100$, where $Dlink$ denotes the linkage distance between clusters and $Dmax$ is the maximum observed linkage distance in the dataset. This ratio expresses relative proximity on a standardised scale, where lower values indicate greater similarity. The identified groups provide the basis for further comparative analysis. In Figure 2, year-on-year employment changes are presented for each group, allowing for visual comparison of cyclical patterns across the three clusters. The identified groups are as follows:

- Group A – Countries with stable employment in the financial services sector. This group includes Austria, France, Greece, Ireland, Norway, Cyprus, Czechia. These countries are characterised by a relatively stable level of employment in the financial services sector, with smaller fluctuations between 2008 and 2024. This stability refers to employment levels at the extensive margin (i.e., number of persons employed) and may reflect institutional resilience or the presence of adjustment mechanisms such as short-time work schemes. In this context, employment rates remain relatively constant even when total labour input (e.g., working hours) fluctuates in response to economic shocks. (Briguglio, 2016; Tang et al., 2022).
- Group B – Countries with moderate employment changes: Bulgaria, Finland, Hungary, Poland, which exhibit more dynamic employment changes in the financial sector. This may result from economic transformation, adaptation to EU regulations, or structural changes within the financial industry. It is worth noting that some countries in this group are emerging economies, which may display greater labour market flexibility in financial services (Prasad, 2010).
- Group C – Countries with high employment variability and strong dynamics. This category

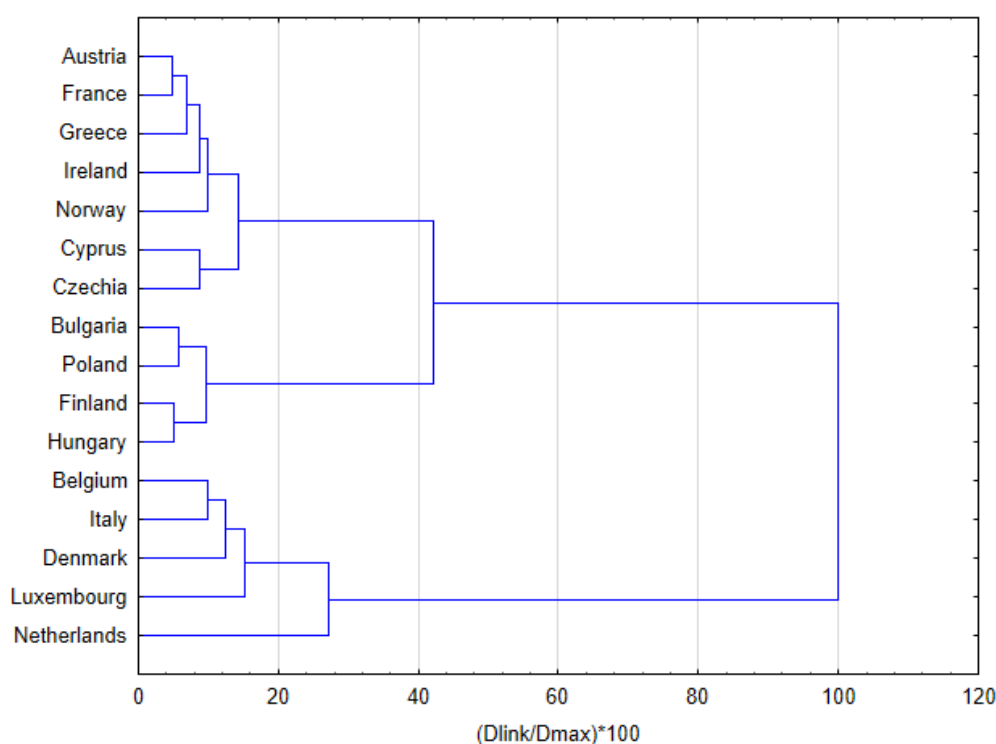


Figure 1. Classification of the studied countries into groups based on similar year-on-year fluctuations and the level of the employment rate in the financial services sector

Source: Own elaboration based on: Eurostat, Employment by Sex, Age, Occupation, and Economic Activity (from 2008 onwards, NACE Rev. 2) (1 000), https://doi.org/10.2908/LFSA_EISN2, [access date: 09.12.2024]

includes Belgium, Denmark, Italy, Luxembourg, the Netherlands, and Portugal, which form a group with the highest employment fluctuations in the financial services sector. This may be due to greater exposure to economic crises, changing regulations, and labour market structures that are more sensitive to economic cycles. Luxembourg and the Netherlands, as Europe's financial hubs, may experience larger employment fluctuations due to global trends in the financial sector (Capelle-Blancard et al., 2024).

Figure 2 highlights the clear cyclicity of employment changes in the financial sector, with seasonal fluctuations recurring at regular intervals. This suggests that employment in this sector is influenced by economic cycles, such as business conditions and regulatory changes. Group A (red line) – this group includes: Austria, France, Greece, Ireland, Norway, Cyprus, Czechia, and Sweden. It is characterised by the lowest level of employment fluctuations, with an average year-on-year variation of 0.53%. The largest employment difference in this group is observed in France (62.7 thousand

employees), which also has the highest average number of employees in the financial sector within this group (247 thousand over the analysed period). The values fluctuate within a narrow range around the average, suggesting greater labour market stability in the financial sector. This may result from institutional factors, a more stable employment policy, or lower sensitivity of the financial sector to macroeconomic changes. Group B (green line) – this group consists of: Bulgaria, Finland, Hungary, Poland, Romania, Slovakia, and Slovenia, showing a moderate level of employment change, which is more stable compared to Group C. The values fluctuate around an average of 0.87%, with less variability than in Group 3 but more than in Group 1. The largest employment difference in this group is seen in Poland (61.7 thousand employees), which also has the highest number of employees in the financial sector in Group 2 (an average of 86 thousand over the analysed period). This may indicate moderate labour market flexibility and limited effects of economic cyclicity in the financial sector. Group 3 (blue line) – this group includes: Belgium, Denmark, Italy, Luxembourg, the Netherlands, Portugal, and Spain, and is characterised by the highest employment variability and the widest range of values. The

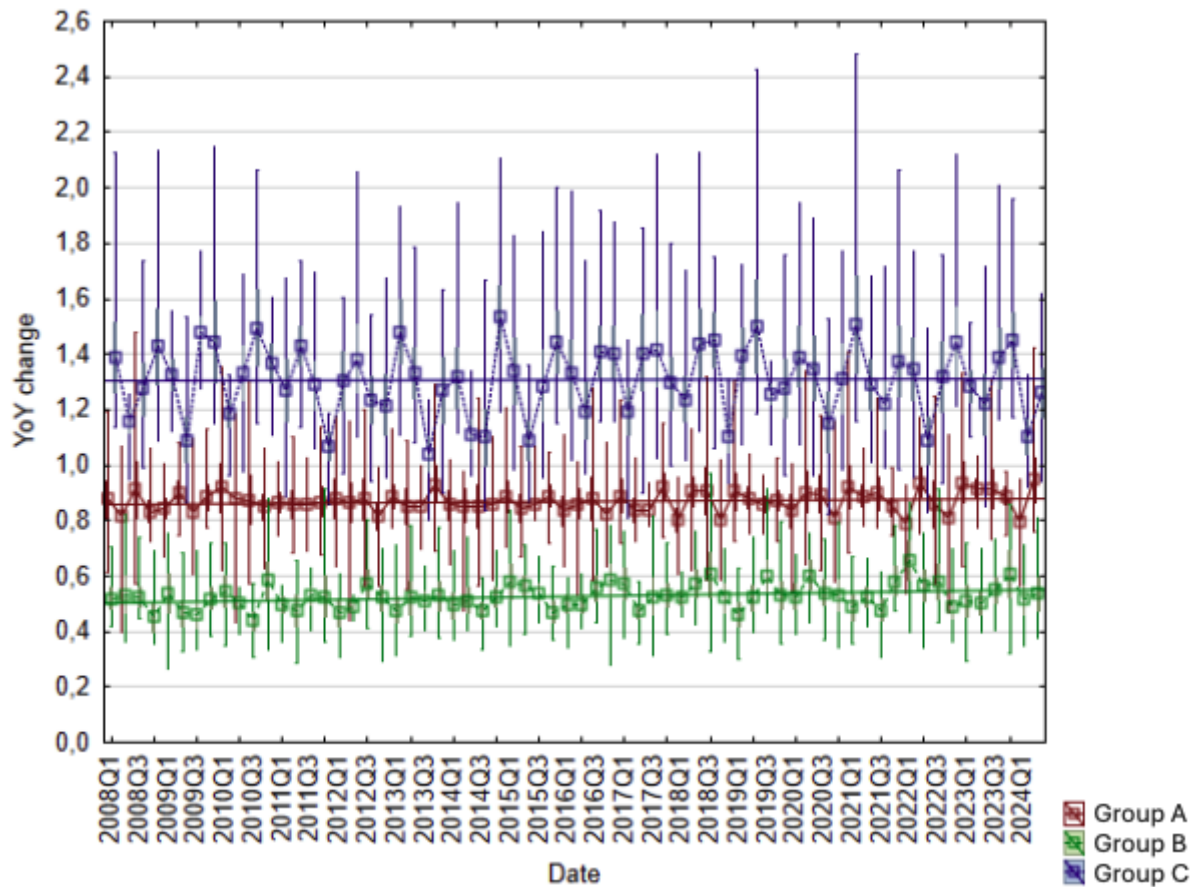


Figure 2. Year-on-year changes in the overall employment rate in the financial sector across country groups from 2008 to 2024, where Group A = Austria, France, Greece, Ireland, Norway, Cyprus, Czechia, Sweden; Group B = Bulgaria, Finland, Hungary, Poland, Romania, Slovakia, Slovenia; Group C = Belgium, Denmark, Italy, Luxembourg, the Netherlands, Portugal, Spain

Source: Own elaboration based on: Eurostat, Employment by Sex, Age, Occupation and Economic Cctivity (from 2008 onwards, NACE Rev. 2) (1 000), https://doi.org/10.2908/LFSA_EISN2, [access date: 09.12.2024]

fluctuations are stronger, with an average year-on-year variation of 1.3%, and more pronounced cyclicity. The country with the largest financial sector employment in this group is Italy (229 thousand employees on average over the analysed period), while Luxembourg has the smallest employment level (13 thousand on average). High variability in this group may indicate greater exposure to economic shocks, financial market deregulation, or more dynamic changes in employment structures.

To complement this analysis, Figures 3–8 present the results of the spectral time series analysis, disaggregated by gender. These figures offer a more detailed insight into the dominant frequency components of employment fluctuations within each of the previously identified country groups.

The analysis was conducted with a gender-based division. The application of spectral analysis allows for the identification of key cyclical components,

determining the dominant frequencies of employment changes and their intensity. The spectral density values indicate the contribution of specific frequencies to the overall employment dynamics and provide insights into the employment patterns in different country groups and the structural factors influencing observed trends. Based on the results shown in Figure 3, the following characteristics can be distinguished for the three country groups for each gender (some countries appear in similar clusters across both gender categories, others differ significantly):

- Group 1: Spectral graphs indicate the presence of dominant components with medium and high frequencies (range 0.1–0.44), suggesting high employment instability and frequent short-term changes. Among men, strong spectral components appear within the medium and high-frequency range (0.15–0.44), indicating high employment dynamics. High-frequency fluctuations may be

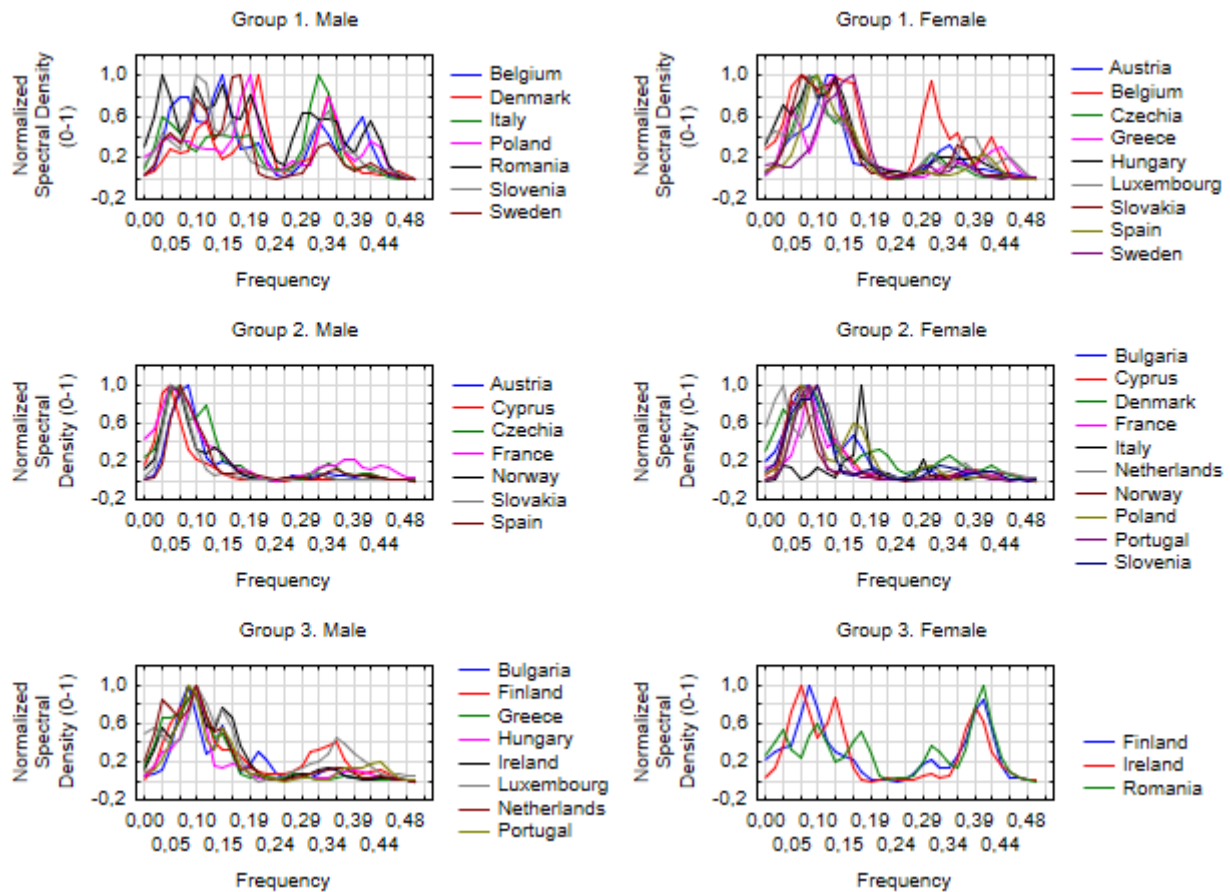


Figure 3. Spectral density values of employment rate changes in the financial sector, disaggregated by gender and grouped by country clusters (Panel Groups 1–3, each divided into male and female categories)

Source: Own elaboration based on: Eurostat, Employment by Sex, Age, Occupation and Economic Activity (from 2008 onwards, NACE Rev. 2) (1 000), https://doi.org/10.2908/LFSA_EISN2, [access date: 09.12.2024]

linked to flexible labour markets, where short-term contracts and restructuring significantly impact employment levels. Among women, similar medium and high-frequency components are observed, but with lower amplitude, suggesting that women's employment in these countries is also subject to short-term fluctuations, albeit with lower intensity than men's employment.

- Group 2: Spectral graphs for this group show low cyclical fluctuation intensity, and high-frequency components play a minimal role. Among men, low-frequency components (below 0.10) dominate, indicating long-term persistence in employment fluctuations, which may point to hysteresis effects – particularly if employment levels fail to fully recover after downturns. The similarity of spectral patterns across genders in this group may imply that persistent labour market scars affect both men and women, though potentially through different mechanisms (e.g., re-entry barriers vs. role segmentation).

- Group 3: Spectral graphs indicate the dominance of low- and medium-frequency components (mainly below 0.1), suggesting that employment changes in the financial sector follow long-term trends. Among men, strong low-frequency components (0.05–0.15) suggest stable, long-term employment trends. The lack of dominant high-frequency components indicates low exposure to short-term fluctuations, although such fluctuations are still present. Among women, spectral density results reveal a pattern similar to that of men—the dominance of low-frequency components suggests relative employment stability. However, fluctuations around a 0.4 frequency value indicate the presence of short-term components, suggesting that women in the financial sector in these countries may be less affected by cyclical market changes. While the findings may appear counterintuitive given the existing literature emphasising the greater vulnerability of women in the labour market, several factors may help explain

this pattern. Men in the financial sector are more likely to be employed in highly cyclical areas such as investment banking or trading, which are closely tied to macroeconomic fluctuations (Shin, 1999). In contrast, women are often concentrated in administrative and service-oriented roles that may be less exposed to short-term volatility. Moreover, flexible or part-time contracts (typically considered a disadvantage) may also facilitate labour market adaptability, potentially reducing the incidence of job loss (Schwartz et al., 2025). According to Eurostat Labour Force Survey (LFS) data for 2024, around 22% of women in the EU financial and insurance sector worked part-time, compared to 6.5 % of men (Eurostat, 2024). These structural and functional distinctions within the sector may account for the relatively greater employment stability observed among women.

5. Conclusions

A characteristic feature of employment in the labour market is its procyclicality: during periods of economic recovery, companies increase demand for labour, but employment fluctuations tend to lag behind economic trends, as businesses prefer to first observe the stabilisation of favourable economic conditions. In contrast, during periods of economic slowdown, job cuts typically occur more quickly, as demand declines and financial conditions worsen (Drozdowicz-Bieć, 2006; Stremmel, 2015). The development of new technologies further affects labour market dynamics by enabling partial automation of processes (Kolade & Owoseni, 2022). On the one hand, this fosters the emergence of new jobs and specialisations in digital fields, but on the other, it can lead to ‘jobless recoveries’, where companies limit recruitment during economic growth periods by replacing some positions with technological solutions (Ball et al., 2017). Historical events, such as the transformation in Central and Eastern European labour market during the 1990s or the 2008 financial crisis, have accelerated the pace of structural changes—many industrial sectors declined, while the importance of the services sector increased (Rutkowski, 2006; Johnstone et al., 2019).

The financial sector plays a particularly important role, as it is one of the most integrated and highly regulated industries, which enhances stability but also affects its ability to quickly respond to economic fluctuations (Villar Burke et al., 2015; Holda & Łojek,

2024). The global significance of European financial centres (e.g., Frankfurt, Luxembourg, Amsterdam) means that economic turbulence or regulatory changes in this sector impact investment levels, financing opportunities, and employment across the EU (Florcza, 2020). At the same time, the European Union implements various support programmes and initiatives (e.g., in education and workforce activation) aimed at mitigating the negative effects of economic crises, improving employment stability, and facilitating smooth transitions to new business models (European Commission, 2025b).

The classification of countries into three groups, based on hierarchical cluster analysis, revealed significant differences in the stability and dynamics of financial sector employment across the EU. While some countries exhibited strong employment resilience, others showed greater sensitivity to economic fluctuations. These findings served as a foundation for further spectral and gender-disaggregated analyses.

Importantly, the gender-specific spectral analysis highlighted that cyclical employment responses are not uniform. Differences in the frequency and persistence of employment fluctuations suggest that men and women may experience economic shocks through distinct labour market mechanisms. These insights underscore the value of disaggregated approaches in assessing labour market dynamics in a sector undergoing structural and technological change.

The gender-based analysis revealed significant differences in employment dynamics, indicating that men are generally more susceptible to short-term economic fluctuations, while women, although affected by cyclical changes as well, tend to exhibit greater employment stability. While our study does not directly estimate hysteresis econometrically, the spectral analysis offers meaningful insights into the persistence of employment fluctuations over time. The presence of low-frequency components in several country groups suggests that employment in the financial sector does not always adjust quickly after economic shocks, particularly for certain genders. It should also be acknowledged that part of these observed changes may reflect labour reallocation rather than exits into unemployment or inactivity, especially in countries undergoing structural transformation. These findings may be interpreted through the lens of labour market hysteresis, where economic downturns leave lasting effects on employment structures and participation patterns.

Therefore, the study contributes to the broader literature on the scarring effects of economic crises and highlights the importance of gender-sensitive labour policies that account not only for short-term shocks but also for their long-term consequences. This implies a need for targeted support for occupational mobility, continuous skills development, and improved access to disaggregated labour data to inform more effective and inclusive policy design.

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