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Measuring Work Flexibility Across Europe: A Multidimensional Composite Indicator Approach

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Extended abstract

Background and research goals

People's lives are affected by changes in the labour market, and the quality of employment has a fundamental impact on people's well-being. Working conditions therefore play a crucial role in worker's lives, as the conditions in which workers carry out their tasks can affect many different areas, such as, housing, sleep, eating habits and physical and mental health. Working conditions have changed as the labour market has become more complex and diverse. The European Foundation for the Improvement of Living and Working Conditions (Eurofound) that aims to develop better social, employment and work-related policies, suggests that the *working conditions* can be defined as the conditions in and under which work is carried out. One aspect of working conditions that has become increasingly important over time is work flexibility. In the workplace, flexibility can be described as an individual's ability or capacity to choose the time, place and duration of work-related activities (Hill, 2008). Work flexibility has become a central theme in contemporary labour market debates across European countries. Recent research highlights how successive crises, including the COVID-19 pandemic, have accelerated labour market flexibilization and increased precarization, leading to significant regional disparities across the EU (Kapitsinis & Gialis, 2023). This transition towards more flexible work arrangements is influenced by a complex interplay of regulatory policies, economic pressures, technological advancements, and evolving social dynamics. Work flexibility can be broadly categorized into three dimensions: *time flexibility*, referring to working hours and their adaptability; *place flexibility*, encompassing remote and hybrid work; and *contract flexibility*, involving part-time work, fixed-term contracts, and self-employment (among others see: Anttila et al., 2015; Lott, 2015; Thompson et al., 2015; Hill, 2008).

This study examines the complex and multidimensional nature of work flexibility in Europe from the perspective of workers, with the aim of providing a comprehensive analysis of its determinants and implications.

Given the complexity of work flexibility, relying on elementary indicators to measure it may be insufficient. Instead, to better consider the multidimensionality of work flexibility, it may be more appropriate to consider composite indicators, that combine several dimensions to provide a broader

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view of the phenomenon (Mazziotta and Pareto, 2013). In fact, composite indicators, as they represent a mathematical aggregation, are usually considered as an essential tool in social and environmental statistics and economics, to better synthetise and present complex information. Accordingly, a broader and more comprehensive view of work flexibility can be obtained by looking at the different components of flexibility together. The combination of these elements, with the aim of creating a composite indicator, can be achieved through various aggregation methods (Salzman, 2003; Mazziotta and Pareto, 2011). The strength of this approach lies in its ability to synthesise complex information and data on flexibility, thus allowing for a broader and more comprehensive analysis.

The aim of this study is to develop and analyse a composite indicator that aims to reflect the flexibility of working conditions in different European countries. In doing so, it develops a specific framework that considers several dimensions that have been addressed in the literature but have not been combined together yet. The paper first introduces a theoretical framework and then proposes a composite indicator to measure work flexibility based on key pillars of flexibility represented by 37 elementary indicators, including *part-time work*, *location flexibility*, *irregular* and *unconventional working hours*, and *work-life balance*. Part time has a long history of being accepted as a key indicator of flexibility (Grmanová & Ivanová, 2021). Location flexibility is defined as the possibility of working from different locations, contrary to working from the traditional office environment (Golden, Henly and Lambert, 2014). This indicator has been recognised as a fundamental flexibility dimension from which both individual and organisations can benefit. Irregular and unpredictable work schedule are increasing their presence in the labour market making the frequency of changes in working schedule a strong indicator of work flexibility (Lee & Kawachi, 2021). Working hours are considered by many as a proxy of flexibility (Golden, Okulicz-Kozaryn, 2015). Additional information on work flexibility can be suggested also by atypical working time, which can be defined as the working time that is not covered by the traditional 9-5 working day (Grmanová & Ivanová, 2021). The ability of workers to take some time off from work allows workers to have an improved work life balance which makes this dimension important in the context of flexibility (Ray & Pana-Cryan, 2021). Lastly, the frequency to which workers use their free time to complete working tasks can be added to the list of possible indicators of flexibility (Ray & Pana-Cryan, 2021). The proposed composite indicator provides valuable insights on the state of flexibility in Europe across two periods (2015 and 2021), as well as identifying the primary factors influencing flexibility across different national contexts.

Data and methodology

The data source for the proposed analysis is the European Working Condition Survey[1] (EWCS). The survey is a probability-based survey collecting information on several aspects of working conditions making it comparable across European countries. There are several studies in the literature that use the EWCS data to analyse flexibility and its impact on individual wellbeing (see among others Tangian, 2007). However, the existing literature does not provide a specific theoretical framework for analysing work flexibility from multiple perspective.

The aim of this analysis is to implement an effective approach to combine the elementary indicators defined to create a coherent and measure of work flexibility. To this purpose, we propose the use of composite indicators, which are able to give a comprehensive view as they can integrate multiple dimensions of a specific phenomenon. We consider two different non-compensatory aggregation

[1] https://www.eurofound.europa.eu/en/surveys/european-working-conditions-surveys-ewcs

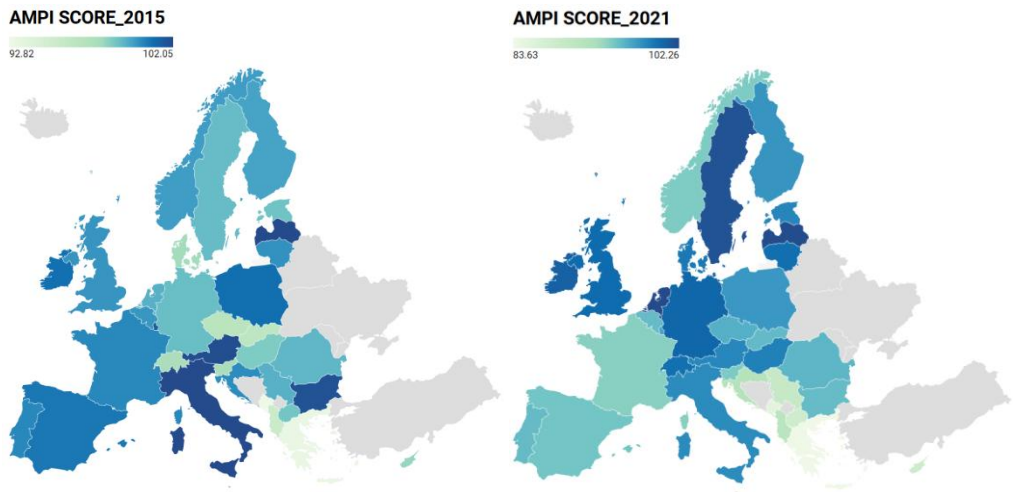
approaches, the adjusted Mazziotta-Pareto index (AMPI) and the geometric mean (Mazziotta and Pareto, 2013; OECS & JRC, 2008), to ensure that the indicator accurately reflects the different levels of flexibility across European countries. This indicator should be able to effectively suggest and propose which are the main influences of flexibility. By analysing data from both 2015 and 2021, the study aims to provide insights into the evolution of work flexibility over time. As such, this study is able to improve and integrate a broader understanding of how flexibility can be quantified and compared. Therefore, this study can add to the collection of studies with a composite indicator that includes different dimensions of this complex phenomenon.

Results and conclusions

The rankings of the composite indicators were used to evaluate the ability of the composite indexes to accurately represent work flexibility across European countries. A higher value on the composite index indicates a greater level of work flexibility, providing additional context for understanding the varying degrees of flexibility in different labour markets. The comparative analysis revealed that regional disparities in work flexibility across Europe, where there are different cultural and structural factors related to the labour market. Northern and Western European countries maintain high, employee-centred flexibility, supported by strong institutional frameworks, part-time work, and welfare protections (Lott, 2015; Anttila et al., 2015). In contrast, Southern and Eastern Europe show greater variability, with some nations experiencing declining scores, reflecting employer-driven flexibility, job instability, and labour market fragmentation, exacerbated by the COVID-19 pandemic (Kolasa et al., 2021).

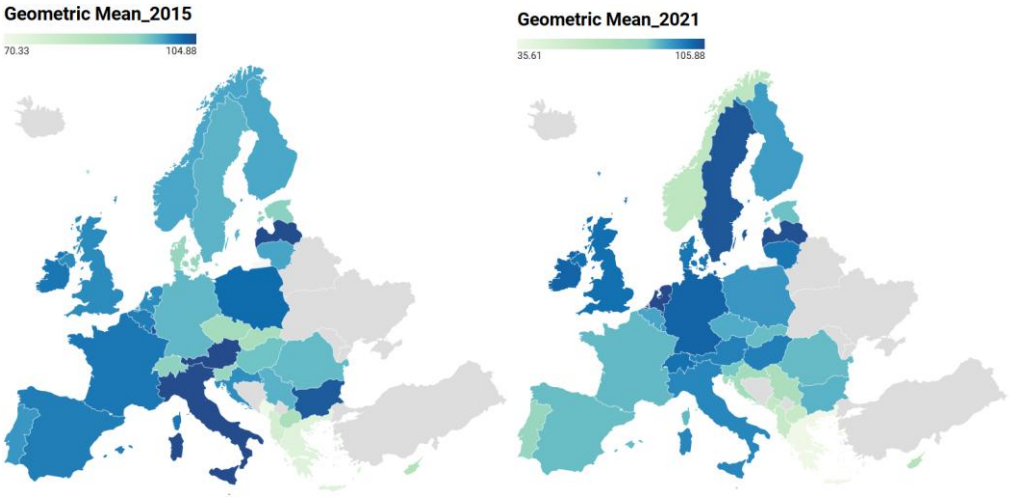
The 2021 rankings highlighted some changes from 2015, indicating shifts in labour market flexibility. Figures 1 and 2 illustrate the evolution of the AMPI score and the Geometric Mean score respectively across European countries between 2015 and 2021. These indices provide a comparative assessment of labour market flexibility dynamics over time. These results could suggest that the measures implemented in certain countries to support flexibility in the period analysed were insufficient to maintain its previous positions in the ranks.

Figure 1 Adjusted Mazziotta-Pareto index score



Source: EWCS data - own elaboration (created with Datawrapper).

Figure 2 Geometric mean score



Source: EWCS data - own elaboration (created with Datawrapper).

This study evaluates the ability of the index to produce stable and accurate results through influence and robustness analysis. Influence analysis examines sensitivity to changes in individual data points, while robustness analysis evaluates the consistency of the indicator. The most sensitive and robust aggregation method was the geometric mean. This result could be attributed to the geometric mean's responsiveness to small changes in individual indicators and due to its proportional handling of extreme values. This unique characteristic could enable the geometric mean to be sensitive to local changes in individual indicators but at the same time it could maintain an overall stability when there are broader changes. The indicators that most significantly affected shifts in the rankings when excluded from the composite indicators were the location flexibility indicators, showing a strong influence across all methods and years. Other impactful variables were taking time off when needed and using free time for work. From a theoretical perspective, these kinds of flexibility indicators emphasize the importance of flexibility in work arrangements. Such flexibility is essential for enhancing employee well-being and productivity. The influence of these indicators provides valuable insights for both the employer and the employees, offering a practical application of flexibility theory in work environments.

The study was successfully able to achieve its primary objective of constructing a composite index to measure work flexibility. The results highlighted the advantages and limitations of the various methodological approaches employed, offering beneficial understandings into their respective strengths. Particularly, results provided some interesting suggestions on changes in flexibility across countries and over time, indicating that further investigation into the underlying factors driving these variations would be interesting. Moreover, the composite indicators developed in this study provided additional analytical perspectives by integrating a broader theoretical framework. This comprehensive approach allowed for a deeper understanding of the multidimensional nature of work flexibility and the role and impact of individual components within the overall composite measure, yielding new focal points and a basis for future research on the topic and its determinants across different contexts.

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