Gender Equality and the ESG Performance: An Index-Based Comparative Analysis of Hungary, Czechia, Poland, and Spain With a Focus on the Gender Pay Gap

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This paper examines the environmental-corporate-societal performance of Hungary, Czechia, Poland, and Spain through an index-based approach, incorporating gender equality as a key dimension. The research aims to assess how gender disparities, particularly the gender pay gap, influence sustainability-related performance in these countries. The methodology employs a composite index integrating environmental, corporate, and societal indicators, weighted according to multiple scenarios to ensure robustness. The findings reveal significant variations among the analysed countries, highlighting the impact of gender disparities on corporate and societal outcomes. The results suggest that nations with narrower gender pay gaps tend to perform better in sustainability-related metrics, underlining the interdependence of economic inclusion and sustainable development. However, data availability and methodological constraints pose certain limitations. The paper provides insights for policymakers and business leaders seeking to enhance gender equality while fostering sustainable corporate and societal practices. The originality of this research lies in its multidimensional index approach, offering a novel perspective on the intersection of gender equality and sustainability performance across diverse European economies.

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1 Introduction

The pursuit of gender pay parity has a long-standing history, dating back to the 1857 strike by approximately forty thousand textile industry workers in New York, who demanded equal wages and reduced working hours (England et al., 2020). Despite nearly 170 years of progress, gender-based wage disparities persist as a global issue. The gender pay gap (abbreviation: GPG), defined as the difference in average earnings between men and women, remains one of the most widely recognized yet contentious forms of social inequity. Extensive research has identified key contributing factors, such as unequal access to education, occupational segregation, discrimination, caregiving responsibilities, and unpaid labour, yet the gap persists significantly (Jurado de los Santos et al., 2020). While recent years have seen some progress, the pace of change toward gender parity in economic opportunities remains slow. Recognizing these challenges, the European Union (abbreviation: EU-27)'s 2020–2025 Gender Equality Strategy aims to create a society where individuals, irrespective of gender, have equal opportunities to pursue their chosen careers, attain economic prosperity, and participate in governance. However, the most recent data from 2021 reveals that, on average, women in the EU earned 12.7% less than men, with substantial variations across member states (Leythienne & Pérez-Julián, 2021).

2 Literature Review

Gender equality has been a key focus in international human rights, particularly within the United Nations (abbreviation: UN) Sustainable Development Goals (abbreviation: SDGs). The 1945 UN Charter first recognized it as a fundamental principle, and this commitment has since been integrated into international laws and policies. The Universal Declaration of Human Rights also incorporates gender equality into international human rights law (Hashmi, 2019). Gender equality is a core principle of the UN's Sustainable Development Goals, with SDG5 directly addressing it and SDG10 focusing on reducing inequalities more broadly. This reflects the recognition that achieving sustainability and social justice requires including all individuals regardless of gender (Rebelo & Guimarães, 2022). The principle of equal pay for equal work was first introduced in the Treaty of Rome and reinforced through EU-27 legislation, including the Equal Treatment Directive. This directive prohibits direct and indirect pay discrimination, requiring gender-neutral

job classification systems (Lavena & Riccucci, 2012). Wage disparities continue due to structural and cultural factors. Gender stereotypes lead to women being concentrated in lower-paying jobs and industries. Obstacles like the "sticky floor" and "glass ceiling" hinder women's career advancement and access to senior roles. Additionally, unequal caregiving responsibilities compel women to seek flexible but lower-paid work, impacting their participation in the labour market (Hsieh et al., 2023). These systemic issues contribute to wage discrimination, undermining equal pay. To address persistent inequalities, the EU-27 has launched key initiatives such as the Gender Equality Strategy and the Pay Transparency Directive. These aim to tackle pays and pension gaps, unequal representation in decision-making, and gender-based violence and stereotypes. The Directive promotes transparency through objective pay structures, salary disclosures, and reporting mechanisms (England et al., 2020). However, its implementation remains uneven across Member States, and its effectiveness is contingent upon robust enforcement and integration into broader gender equality frameworks (Boll & Lagemann, 2019). While the legal and institutional frameworks are well-established, the persistence of gender inequality in practice reveals a gap between formal commitments and lived realities. This highlights the need for a shift beyond compliance toward transformative approaches that address the structural and cultural reproduction of inequality. Gender equality and ESG are increasingly interconnected. ESG's social component aligns with gender equality goals like diverse workplaces and fair pay. Investors prioritize gender pay transparency as a key sustainability metric (Hu et al., 2023). Companies committed to gender equality drive social progress and financial performance. As the ESG framework evolves, regulatory developments such as the Pay Transparency Directive are expected to play a more central role in shaping corporate social performance metrics. Enhanced gender-related disclosures in ESG reporting frameworks are not only a matter of compliance but also reflect growing expectations for corporate accountability and inclusive governance (Zahid et al., 2023). In this context, artificial intelligence (abbreviation: AI) is increasingly employed in ESG data analysis, risk assessment, and reporting automation. AI can boost the detail and effectiveness of gender-related disclosures, but it also raises concerns about algorithmic bias, especially if the underlying data reflect existing inequalities.

3 Methodology

This paper examines the relationship between gender parity and sustainability across four European nations: Hungary, Poland, Czechia, and Spain. These countries were chosen due to their diverse economic and social development paths, varying GPGs, and differing sustainability strategies. The analysis provides a comparative assessment of how gender equality and sustainability performance intersect in these diverse environments. Particularly, the research examines the interplay between environmental performance, corporate competitiveness, and societal well-being, while accounting for the influence of gender-based wage gaps. By integrating these multifaceted dimensions, the paper endeavours to offer insights into how gender equality shapes broader economic and sustainability dynamics within diverse national settings.

3.1 Data Sources

This paper used various data sources to analyse the gender pay gap and its underlying causes. Eurostat data provided a foundation, examining the unadjusted gender pay gap - the difference in average gross hourly earnings between men and women. The Eurostat dataset covers 2010 to 2021 and includes organizations with at least ten employees, excluding agriculture. To supplement this, data from the Hungarian Central Statistical Office was incorporated, offering insights specific to Hungary. Unlike Eurostat, KSH data encompasses all economic sectors and compares the monthly gross average earnings of full-time employed men and women, providing a broader perspective on wage disparities.

3.2 Indices

The paper used various indices to analyse gender equality, including the Gender Equality Index (European Institute for Gender Equality, 2025) (abbreviation: GEI), Gender Inequality Index (Nations, 2025b) (abbreviation: GII), and Gender Development Index (Nations, 2025a) (abbreviation: GDI). The GEI, used by the EU-27, considers economic, political, and social factors influencing gender equality, tracking progress and highlighting top performers. The GII examines gender disparities in education, employment, and politics. The GDI provides insights into

gender-based differences in economic and educational opportunities across countries. These indices offer a nuanced understanding of gender-based wage inequalities within broader socioeconomic conditions.

3.3 Data Processing and Standardization

To ensure consistency and comparability, the data was carefully processed. All country-level data went through rigorous cleaning and standardization to account for differences in economic development and social factors. This involved normalizing datasets and aligning them with internationally recognized methods to maintain reliable comparisons. Trends in the gender pay gap between 2010 and 2021 were examined using data from Eurostat and KSH, as well as other relevant economic and social indicators. When analysing changes in gender pay disparities, a focus was placed on the relationship between economic performance and social policies in different countries. The paper compared the GEI, GII, and GDI indices to gain deeper insights into gender disparities and their socioeconomic implications. By examining these indices together, the research aimed to capture the complex nature of gender inequalities and their impact on wage differences. The findings not only present statistical data but also provide context through a systematic analysis of gender-based inequalities, seeking to understand the underlying causes of the gender pay gap and lay the groundwork for future policy decisions.

4 Results

The findings show an overall improvement in gender equality across the studied countries, though the pace and extent vary. Spain made the most notable progress, with its GII increasing from 0.90 to 0.94 and its GEI rising from 0.66 to 0.76. This suggests Spain has significantly reduced gender disparities and empowered women across socioeconomic areas. Poland also exhibited steady advancement, with GII improving from 0.83 to 0.89 and GEI increasing from 0.56 to 0.62, indicating a gradual yet consistent enhancement of gender equality. In contrast, Hungary showed the least improvement, with GII moving only slightly from 0.75 to 0.76 and GEI rising modestly from 0.52 to 0.57, implying slow and limited gender parity gains. The Czech Republic, starting from a higher baseline, recorded moderate gains, with GII increasing from 0.61 to 0.88 and GEI from 0.56 to 0.58, suggesting a more moderate

pace of progress in bridging the gender gap. Further analysis revealed significant variation in the degree of change. Hungary exhibited the most limited progress, with a 28.94% decline in its gender equality measure, indicating potential stagnation or regression. Conversely, the Czech Republic achieved the most substantial advancement, with a 74.31% increase in gender equality, suggesting the effectiveness of gender-focused policies and broader socioeconomic shifts. Poland and Spain recorded moderate improvements of 7.3% and 13.22%, respectively, reflecting steady but less dramatic transformations in gender equity. Based on the data, varying trends can be observed among the analysed countries between 2010 and 2021. In Hungary, the decrease in the index (from 0.2340 to 0.1663) indicates a negative change, while a significant improvement is observed in the Czech Republic (from 0.2520 to 0.4393). Both Poland and Spain exhibit an upward trend; however, the magnitude of growth is milder in Poland (from 0.5903 to 0.6334) and more pronounced in Spain (from 0.6328 to 0.7165). These differences may suggest that the impact of economic, social, or other development measures varies by country. Consequently, further analysis in regions exhibiting a declining trend is recommended to identify the underlying causes of the negative changes.

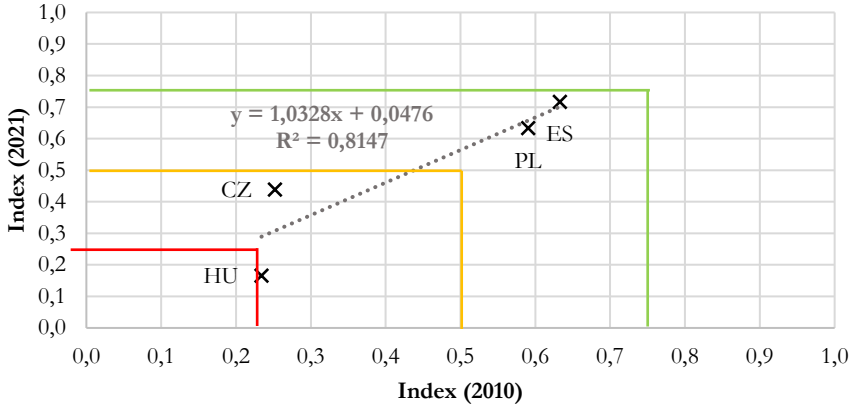

Figure 2: Comparing gender equality index values from 2010 to 2021 for the countries examined.

The analysis of the studied countries suggests three distinct patterns in their gender equality trajectories. Spain and Poland, with relatively high initial and final gender equality values, have undergone gradual but consistent improvements. In contrast, Hungary stands out as an outlier with the slowest progress, while the Czech Republic demonstrates the most significant advancement in gender equality. These varied outcomes underscore the complex interplay of policy frameworks, labor market structures, and socioeconomic conditions in shaping gender equality progress. The observed patterns highlight the multifaceted nature of gender inequality, which is influenced by policy, labor market, and broader societal factors. While the overall trajectory indicates progress, the variations across countries emphasize the need for targeted policy interventions to further bridge gender disparities and sustain advancements. The findings suggest that policy consistency, economic stability, and societal attitudes play pivotal roles in shaping the extent of gender equality progress within each national context.

5 Discussion

The results of this paper demonstrate a nuanced and at times contradictory association between gender equality indicators and the GPG. While metrics such as the GEI and GDI were expected to exhibit a negative correlation with the GPG, implying that improvements in gender equality correspond with a narrowing of the pay gap, the empirical data shows that this relationship is not consistent across all countries. Likewise, the GII was anticipated to show a positive correlation with the GPG, yet in certain instances, the findings diverge from this assumption. The analysis shows that in Spain, improvements in gender equality are strongly linked to a reduction in the GPG. However, the findings for Hungary challenge this pattern, as the gender development index had an unexpected correlation, and the gender equality index and gender inequality index exhibited weak and contradictory relationships with the GPG. The results for Czechia and Poland fall between these two extremes, with Czechia demonstrating stronger associations in certain areas, while Poland shows no clear correlation. The use of broad gender equality indices, such as the GEI, GDI, and GII, has limitations in accurately capturing specific economic inequalities like the GPG. While these indices provide valuable insights into overall gender parity, they often overlook key dimensions of labour market dynamics, economic structures, and national policy environments that shape pay

inequities (Ghosh & Ramanayake, 2021). For instance, countries with strong social protections and collective bargaining systems often achieve relatively low GPG levels despite differing gender equality profiles (Sterling et al., 2020). This paper emphasizes that while gender equality indices provide valuable insights, they alone cannot capture the nuances of the GPG. Policymakers should adopt a more comprehensive approach, accounting for labor market dynamics, social policies, and economic structures (The Nordic Gender Effect at Work, 2019). Digitalization is transforming gender data collection and analysis, with AI and algorithms increasingly used in ESG and labour market monitoring. While these technologies can enhance GPG tracking and policy evaluation, they also raise concerns about data bias and algorithmic bias, especially when trained on datasets reflecting historical inequalities. Responsible and transparent AI use is crucial to ensure digital tools support, not undermine, gender equality efforts. Closely monitoring the EU's Pay Transparency Directive is vital, as past studies suggest pay transparency can reduce wage gaps, but its success hinges on strong enforcement and broader policies.

6 Conclusions

This paper examines the complex relationship between gender equality and GPG. While indices like the GEI, GDI, and GII provide valuable insights into overall gender equality, their correlation with wage disparities varies across countries. The findings suggest that in some cases, such as Spain, these indices align with expected trends, but in others, like Hungary and Poland, the relationship is weaker or contradictory. These results indicate that broader gender equality does not always directly translate into wage parity. Factors like economic structures, labor market policies, and social norms play a significant role in shaping wage disparities, which composite indices may not fully capture. This aligns with previous research highlighting the need for more targeted measures to address gender wage inequalities beyond general equality frameworks. The paper emphasizes the importance of policy interventions, such as the EU Pay Transparency Directive, which could be a crucial step in closing the GPG. However, the directive's impact will depend on how countries implement and enforce it. Future research should track these developments and assess the directive's effectiveness in reducing wage disparities. Despite progress toward gender equality, eliminating unjustified pay differences remains challenging even in highly developed economies. A multifaceted approach,

combining policy reforms, labor market interventions, and continuous monitoring of wage data, will be essential for achieving gender pay equity.

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