GÉNEROS
MULTIDISCIPLINARY JOURNAL OF GENDER STUDIES

Hipatia Press
www.hipatiapress.com

Multidisciplinary Journal of Gender Studies
Volume 14, Issue 2, 25th June 2025, Pages 98-119
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http://dx.doi.org/10.17583/generos.17599

Reducing Gender Inequality Through Women Political Participation and Female Labor Force: The OECD Case

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Abstract

This study examines the impact of women's political and labor force participation on gender inequality. In this context, 22 OECD member countries with available data are selected as an appropriate sample. Methodologically, the study utilizes the panel cointegration test to explore the relationships among the variables under investigation. The analysis covers the period from 1991 to 2021. The findings indicate that a rise in women's participation in politics and the labor force is linked to a significant decrease in gender inequality. Specifically, the regression results reveal that a 1 percent increase in women's political participation leads to a 1.46 percent reduction in gender inequality, while a 1 percent increase in women's labor force participation results in a 2.28 percent decrease in gender inequality. The study suggests that liberal principles such as equal access to governmental and parliamentary positions, as well as employment opportunities, should be extended to both men and women.

Keywords

Gender inequality, women's political participation, women's labor force participation, feminism

To cite this article: Çakır-Gündoğdu, B., & Gündoğdu, E. (2025). Reducing Gender Inequality Through Women Political Participation and Female Labor Force: The OECD Case. *Multidisciplinary Journal of Gender Studies, 14*(2), pp. 98-119. http://dx.doi.org/10.17583/generos.17599
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Multidisciplinary Journal of Gender Studies
Volumen 14, Número 2, 23 de junio, 2025, Páginas 98-119
© Autor(s) 2025
http://dx.doi.org/10.17583/generos.17599

Reducción de la Desigualdad de Género Mediante la Participación Política de las Mujeres y la Fuerza Laboral Femenina: El Caso de la OCDE

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Resumen

Este estudio examina el impacto de la participación política y laboral de las mujeres en la desigualdad de género. En este contexto, se seleccionan como muestra apropiada 22 países miembros de la OCDE con datos disponibles. Metodológicamente, el estudio utiliza la prueba de cointegración de panel para explorar las relaciones entre las variables bajo investigación. El análisis abarca el período de 1991 a 2021. Los resultados indican que un aumento de la participación de las mujeres en la política y la fuerza laboral está vinculado a una disminución significativa de la desigualdad de género. Específicamente, los resultados de la regresión revelan que un aumento del 1 por ciento en la participación política de las mujeres conduce a una reducción del 1,46 por ciento en la desigualdad de género, mientras que un aumento del 1 por ciento en la participación de las mujeres en la fuerza laboral resulta en una disminución del 2,28 por ciento en la desigualdad de género. El estudio sugiere que los principios liberales, como la igualdad de acceso a los cargos gubernamentales y parlamentarios, así como a las oportunidades de empleo, deberían extenderse tanto a hombres como a mujeres.

Palabras clave

Desigualdad de género, participación política de las mujeres, participación laboral de las mujeres, feminismo

Cómo citar este artículo: Çakır-Gündoğdu, B., y Gündoğdu, E. (2025). Reducción de la desigualdad de género mediante la participación política de las mujeres y la fuerza laboral femenina: el caso de la OCDE. *Multidisciplinary Journal of Gender Studies, 14*(2), pp. 98-119.
http://dx.doi.org/10.17583/generos.17599
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The aim of this study is to analyze the impact of political and labor force participation on gender inequality. In this context, it is first necessary to touch upon the theoretical and conceptual basis of the study. The feminist construction of liberal feminist theory forms the conceptual basis of this study. Basically, different schools of feminism offer divergent perspectives on the meaning of gender, the origins of gendered power relations, and the most effective strategies for combating gender-based oppression (Hutchings, 2000). Marxist feminism argues that the oppression and discrimination of women are inherent consequences of capitalism. Radical feminism calls for greater efforts to alter women's roles in reproduction. Postcolonial feminism critiques Western feminism by focusing on the concept of colonization. Cultural feminism advocates for the promotion of feminine behavior over masculine traits (Aydin-Koyuncu, 2014). Postmodern feminists dismiss the idea of a stable, unchanging, or inherent concept of gender and critique dominant discursive practices. Critical feminist theorists contend that Western feminism can be oppressive and emphasize the significance of other variables, particularly race and class (Saloom, 2006).

Liberal feminism, on the other hand, emphasizes the necessity of granting women equal voting rights alongside men. It further advocates for women, once they have achieved relevant legal and social gains, to seek equal opportunities in the free market economy. Liberal feminists support a non-violent struggle for legal and social reforms to secure equal rights for women (Aydin-Koyuncu, 2014). They argue for the elimination of irrational prejudices against women and for the application of liberal principles to both men and women. Liberal feminism opposes the usurpation of women's political ability and the relegation of women out of the public sphere. Thus, the central focus of liberal feminism is the lack of gender equality in public life. Its ultimate aim is to ensure that positioning of women in mainstream modern society (Brown, 1988). In alignment with the methodology suggested by this theoretical framework, this study uses the variables that liberal feminist theory is based on, excluding variables such as capitalism, women's roles in reproduction, colonialism, feminine behavior, discourse, race and class that alternative feminist theories are based on.

Gender inequality, as a concept, refers to the discrimination, challenges, or missed opportunities faced by individuals, particularly women, due to their gender. This inequality manifests in areas such as healthcare, education, employment, income, and political engagement (Cairney et al., 2022). Gender inequality encompasses disparities in the roles of human being with different biological sexes as economic, legal, and parental agents, and remains prevalent in modern societies as a historical legacy of patriarchy. This form of inequality has inspired various intellectual inquiries aimed at promoting equality in access to rights and opportunities (Elias & Mussi, 2018).

Regarding the concept of gender inequality in relation to politics and economics, we should firstly define stereotype as a concept linked to gender inequality. The concept of stereotype refers to a set of beliefs concerning the personal attributes of a particular group of people. Various stereotypes are encountered that reflect beliefs about the members of the male and female categories. These stereotypes are primarily based on the erroneous assumption that men are more rational than women (Makulilo, 2020). The characteristics attributed to women and men are continuously reinforced through such stereotypes. While biological sex is determined by nature, culture, on the other hand, dictates the social construct of what it entails to be male or female. In this context, gender emerges as a phenomenon in which inequality and

discrimination are perpetuated (Gasztold, 2017). In line with conceptual and theoretical foundation of this study, we posit that women's increased participation in both politics and labor force will substantially reduce gender-based bias across various areas of social life.

Historically, political leadership positions have predominantly been held by men. Traits such as assertiveness, dominance, and rationality have often been associated with masculinity, leading to the common perception that leadership is inherently a male domain. This gendered framework is also evident in the distribution of senior administrative roles within contemporary state administrations. Notably, men continue to dominate key portfolios related to core state functions, such as defense, justice, and foreign policy (European Institute for Gender Equality, 2017). Data gathered each year by different organizations indicate that modern societies remain far from achieving the minimum standard of gender equality necessary to ensure sufficient political participation of women. A similar gap is evident in the number of women working in the diplomatic institutions responsible for the conduct of foreign policy relations of states and in the transnational institutions that bring states together, because these numbers are below fair standards (Lenine & Sanca, 2022). Despite women's equal right to vote, significant inequalities persist in areas like political campaigning and representation within political parties worldwide (Skorge, 2023).

Although political participation is fundamental to democratic governance, as it allows citizens a voice in societal decision-making, research has highlighted substantial inequalities in political engagement (Grasso & Smith, 2022). The literature addressing gender in relation to political inequality has primarily concentrated on the concept of "political representation," which includes both the quantitative dimension of women's representation in constitutional bodies such as the legislature and the executive, which are decision-making bodies, and the qualitative dimension of representation regarding the extent to which women's values affect political decisions. Researchers have thoroughly examined the presence of rooted barriers weakening the position of women in politics, including the deeply ingrained perception of politics as a field suitable only to men's nature (Lombardo, 2008). The participation of women in powerful roles within key societal institutions is a critical demonstration of gender equality, as democratically representative organizations are more likely to develop reformist policy initiatives that oppose gender discrimination and provide women with an advantageous position in various initiatives (Schmid et al., 2023).

Gender inequality is not confined to the political sphere; it is also evident in the dynamics of the modern economy. In fact, women still bear the most of the unpaid household and caregiving responsibilities in most contexts. Additionally, women participate in paid labor across both formal and informal sectors, working as salaried employees or employers. However, significant and persistent gender disparities in both unpaid and paid work remain, reflecting ongoing constraints on women's economic opportunities. It is crucial to emphasize that women are often confined to jobs that align with gender stereotypes, which are typically characterized by lower wages, substandard working conditions, and limited prospects for career advancement (Klugman & Tyson, 2016).

Gender relations, like all social relations, are complex and multifaceted. Gender inequalities are inherently multidimensional and cannot be reduced to a singular, universally accepted set of priorities. Furthermore, it is essential to acknowledge that a change in one aspect of social relations can trigger a series of changes in other areas, with potentially unpredictable outcomes

(Kabeer, 2005). In this context, the study treats political participation and labor force participation as independent variables, while alternative domains where gender inequality manifests -such as women's health and social status- are considered as dependent variables in the analysis. This approach distinguishes the study from similar research in the literature, which typically focuses on concepts such as employment, income inequality, the cultural and social characteristics of states, and economic growth.

Literature Review

This study reviews research conducted between 2014 and 2024 as part of its literature review. A small number of researches were identified in existing research regarding the relationship among women's political participation and gender inequality. Research on similar topics typically focuses on concepts such as employment, income inequality, the cultural and social characteristics of states, and economic growth. A selection of key studies within this scope are summarized below.

Demir (2015) argued that women are not adequately or equitably involved in politics, particularly in political decision-making procedures, a situation largely rooted in the cultural structures of various countries. Ahmad et al. (2019) highlighted that, in Pakistan, women are primarily assigned roles such as childbearing, performing household chores, and being obedient to their husbands, while men are expected to engage in public sphere activities and support the family.

Mlambo et.al. (2019) observed that women's labor force participation is positively correlated with their political participation, based on a study conducted across 14 SADC (Southern African Development Community) countries between 2010 and 2017. In a study using data from 182 countries, Dahlum et al. (2022) concluded that the rate of women's political participation has a positive influence on economic growth. Xu (2015) examined the impact of women's political participation on economic development using data from 30 selected Asian countries between 1991 and 2013. Xu's study suggests that as women's political participation increases in these Asian countries, economic growth also rises.

Asongu & Odhiambo (2019) examined the relationship among the female employment rate and gender inequality using three inequality indicators: "the Gini coefficient, the Atkinson index, and the Palma ratio". Their study highlighted a decline in female employment as a significant contributor to gender inequality. Asongu et al. (2020) assessed the relationship among globalization and women's economic participation in selected Sub-Saharan African countries between 1990 and 2013. The outcomes showed a positive relationship among the globalization index and women's economic participation. Cheema et al. (2021) emphasized the role of education, demonstrating a positive relationship among the education of women living in urban areas and their political participation. Kim (2019) underscored the importance of the political regime type, noting that rates of women's participation in politics have been higher in democratic countries.

Sheikh et al. (2016) observed the relationship among inequality reduction and socio-economic development in Pakistan using a panel data model with cross-sectional dependence. Their findings indicated that women's social empowerment is influenced by several factors,

such as age, training level, habitance, job status, civil status, investments, and level of income. Sharma (2020), in a study of 423 women, highlighted the significance of factors such as knowledge, education, family support, political and legal environments, and personal motivation for women's political empowerment. Anyango et al. (2018) observed that women face significant obstacles in political life due to violent propaganda, gender-based discrimination, and lack of support from peers. Iheonu et al. (2020), in their study covering the period from 2004 to 2016, demonstrated an inverse U-shaped relationship among income disparity and female disemployment in West Africa.

In contrast, Yildirim & Akinci (2021), through their panel data analysis of middle-income countries from 2001 to 2016, tested the presence of a U-shaped relationship among women participation in labor force and economic growth. They also found that education and the total labor force level positively impact women's participation in labor force. Riman et al. (2023) revealed that as women's political participation increases, the levels of corruption and income inequality in Nigeria decrease. Okafor et al. (2015) noted the disparity in political involvement between genders, particularly in Nigeria, despite women constituting 49% of the population as a whole according to the 2006 census. Kleven et al. (2018), in a study conducted in Denmark, emphasized the "child penalty." Their findings revealed that while the income of women with children decreases, the income of men with children remains unaffected.

Dalha (2023) argued that childbearing and child-rearing roles assigned to women by society, along with religious factors, hinder women's political participation. Hortas-Rico & Rios (2023), in a study of 142 countries covering the years 1990 to 2019, demonstrated that women's political empowerment lowers wage disparity.

Studies in the literature on the relationship between women's employment, political participation and gender inequality focus either on a single country, on a randomly selected group of countries or on underdeveloped/developing countries. By focusing on OECD countries, the study is expected to reach more distinctive findings on the extent to which political participation and economic participation variables, rather than sociological parameters such as cultural, religious, traditional, etc., have an impact on gender inequality. Because OECD treats gender equality as a key priority for both fundamental human rights and long-term economic prosperity (Gender and Development, 2024). The reason for selecting OECD countries stems from the continued persistence of gender inequality despite numerous initiatives and policy efforts, including the *OECD Report on Women's Entrepreneurship* (2001), *2015 OECD Recommendation of the Council on Gender Equality in Public Life* (2016), and the establishment of *OECD Forum on Gender Equality* (2024). Therefore, choosing an international organization whose members have no legal tolerance for gender inequality as a sample makes the study different from other studies.

Empirical Data and Methodological Framework

The research, aims to investigate the influence of women's participation in politics and the labor force on gender inequality across 22 OECD countries ("Australia, Austria, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Mexico, Japan, South

Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, and the United States") with available data, spanning the period from 1991 to 2021.

Table 1

Variables

Variables	Symbols	Resources
Gender Inequality Index	GEI	OWD
Women Political Participation Index	WPI	OWD
"Wage and Salaried Workers, Female (% of Female Employment)"	WAGE	WBD

The main model, constructed using data from Our World in Data and World Bank Data for the period of 1991-2021, is represented by equation (1):

GEI=f (WPI, WAGE) (1)

This structural relationship between variables, as presented by Gonzales et al. (2015), Lv & Yang (2018), and Mlambo & Kapingura (2019), is formalized in equation (2):

Model

$$LN(GEI)_{it} = \alpha_{it} + \beta_{it}\,(LNWPI)_{it} + \gamma_{it}\,LN(WAGE)_{it} + \varepsilon_{it} \quad (2)$$

Where LNWPI is the logaritmic of women political participation index, LNWAGE is logaritmic of wage and salaried workers, Female (% of Female Employment),LNGEI is logaritmic of Gender Inequality Index and εit is an error term.α_{it} represents the initial slope parameter, β_{it} and y_{it} represent the slope parameters of the independent variables.

Table 2 shows the descriptive statistics of the variables, based on 682 observations. The minimum value of the LNGEI variable, representing the gender inequality index, is -4.342806, while the max value is -0.6951492. The min. value of the LNWPI variable, which represents the women's participation in politics index, is -0.6236211, with the max value being 0. The minimum value of the LNWAGE variable, representing women's participation in the labor force, is 3.986109, and the maximum value is 4.572591. There is a noticeable variation in the range of values of these variables. Taking the logarithm of these series helps eliminate scale differences among the dependent and independent variables. Therefore, the analysis will proceed by applying the logarithmic transformation to the series in subsequent stages.

Table 2

Descriptive Statistics for OECD-22 Countries

Variables	Number of Observations	Mean	Std.	Min	Max
LNGEI	682	-2.111648	.6543165	-4.342806	-.6951492
LNWPI	682	-.0751539	.1052207	-.6236211	0
LNWAGE	682	4.442242	.1227351	3.986109	4.57251

Since the econometric application results will be presented in the fourth section of the study, the correlation between the variables and the potential multicollinearity issue are first tested. Subsequently, to evaluate whether the series exhibit a cross-sectional relationship, the test statistics for the Breusch & Pagan (1980) test, the Lagrange Multiplier (LM) test, the Pesaran (2004) LM test, the Pesaran CD test, and the Baltagi et al. (2012) tests are provided. Additionally, the Pesaran and Yamagata (2008) test is employed to establish the heterogeneous or homogeneous nature of the series, with results indicating that the series display a heterogeneous structure. Based on this, second-generation unit root tests are applied due to the identified structure of the series. Specifically, the CADF and CIPS tests, which are second-generation unit root tests, are utilized in the analysis. In the final stage, the Westerlund (2007) causality test is applied to investigate the causal relationships among the variables. The detailed findings of all the tests mentioned above are presented in the fourth section of the study.

Results

In the study, variance inflation factor (VIF) values are investigated to assess whether multi-collinearity exists between the independent variables, following the presentation of the descriptive statistics.

Table 3 presents Pearson correlation matrix results along with their significance levels. A negative correlation of 44% is observed between the LNGEI and LNWPI variables, while a 54% negative correlation exists between the LNWAGE and LNGEI variables. Additionally, a positive correlation of 47% is found between the LNWAGE and LNWPI variables. The probability values for these correlations are all 0.0000, indicating that the variables are statistically significant at the 1% level.

Table 3

Pearson Correlation Matrix Analysis

	LNGEI	**LNWPI**	**LNWAGE**
LNGEI	1.0000		
LNWPI	-0.4406 (0.0000***)	1.0000	
LNWAGE	-0.5407 (0.0000***)	0.4776 (0.0000***)	1.0000

Note. *** indicates significance at the 1% level.

Multicollinearity occurs when there is a correlation among two or more independent variables in a multiple regression model. The presence of multicollinearity can lead to unstable and unreliable coefficient estimates, complicating the interpretation of results and making it difficult to draw meaningful conclusions from the model. In this context, the Variance Inflation Factor (VIF) serves as a measure of multi-collinearity between independent variables. A VIF value of 1 signifies no multicollinearity, while a value greater than 5 suggests the presence of

multicollinearity. In this study, the VIF test is applied, and the result obtained is 1.30, as shown in Table 4. Since this value is well below 5, it indicates that multi-collinearity is not an issue in the series.

Table 4
Outcomes of the VIF Test

	VIF	$^{1}/_{VIF}$
LNWPI	1.30	0.771854
LNWAGE	1.30	0.771854
Mean VIF	1.30	

Emprical Analysis

This section addresses the investigation of cross-sectional dependency, which constitutes a fundamental stage of the econometric analysis, as well as the determination of the heterogeneous or homogeneous structure of the series. Second-generation panel unit root tests are utilized in accordance with the characteristics and structure of the series. In the final stage, the Westerlund (2007) cointegration test is employed to investigate the causality relationship among the variables.

Investigation of Cross-Section Dependency

Cross-sectional dependence is a critical test that researchers must investigate prior to conducting panel data analysis. Testing for the presence of cross-sectional dependence in panel data applications, particularly in economics, has become standard practice rather than an exception (Chudik & Pesaran, 2013). Ignoring cross-sectional dependence in the series can lead to incorrect inferences (Baltagi et al., 2016).

The Breusch-Pagan (1980) LM test statistic is expressed in Equation 3.

"$LM_1 = \sum(i=1 \text{ to } N-1) \sum(j=i+1 \text{ to } N) T_{ij} \hat{\rho}_{ij}^2 \rightarrow \chi^2 (N(N-1)/2$" (3)

However, Pesaran (2004) found the Pesaran LM and Pesaran CD tests, as LM test statistic is not suitable for a high number of cross-sectional units (N).

"$LM_1 = \sum(i=1 \text{ to } N-1) \sum(j=i+1 \text{ to } N) T_{ij} \hat{\rho}_{ij}^2 \rightarrow \chi^2 (N(N-1)/2)$" (4)

"$LM = \sqrt{(1 / N(N-1))} \sum(i=1 \text{ to } N-1) \sum(j=i+1 \text{ to } N) (T_{ij} \hat{\rho}_{ij}^2 - 1) \rightarrow N(0,1)$

$CD = \sqrt{(2 / N(N-1))} \sum(i=1 \text{ to } N-1) \sum(j=i+1 \text{ to } N) T_{ij} \hat{\rho}_{ij}^2 \rightarrow N(0,1)$" (5)

In the above equations, $\hat{p}_{ij}$ represents the correlation coefficient of the residuals. All equations are asymptotically normally distributed with $Tij \rightarrow \infty$, $N \rightarrow \infty$ ve $N/Tij \rightarrow cij \in (0, \infty)$.

Below are the hypotheses of the test:

***"H_0:** There is no cross-sectional dependence.*

***H*$_1$*: There is cross-sectional dependence".*

Table 5 shows the cross-sectional dependency test results of Pesaran (2004). LM test is 1343, LM adj* is 151.6, and LM CD* is 26.87, respectively. The probability values of the test results are 0.0000, which indicates that the result is statistically significant because it is less than 0.05.

Table 5

Outcomes of the Cross-Section Dependency Test

Test	Stat.	p-val.
LM	1343	0.0000***
LM adj*	151.6	0.0000***
LM CD*	26.87	0.0000***

Note. *** indicates significance at the 1% level.

Homogenity Test

Determining whether the series are homogeneous or heterogeneous is crucial, as it influences the subsequent econometric analysis. For instance, a heterogeneous structure of the series necessitates the application of second-generation unit root tests. In this regard, the homogeneity test proposed by Pesaran & Yamagata (2008) is applied in the initial stage.

The results of the Pesaran & Yamagata (2008) homogeneity test are showed in Table 6. It is determined that the series exhibits a heterogeneous structure, as the test's probability value is below the 0.05 critical threshold (0.000).

Table 6

Outcomes of the Homogeneity Test (Pesaran & Yamagata, 2008)

	Delta	P-val.
Delta tilde	36.090	0.000***
Adjusted delta tilde	38.671	0.000***

Note. The levels of significance at 10%, 5%, and 1% are represented by *, **, and ***, respectively.

CADF Unit Root Test

In this study, the existence of cross-sectional dependency and the heterogeneous structure among the countries in the panel is assessed. The second-generation unit root tests are employed because first-generation methods do not account for cross-sectional dependency. Therefore, as the first step of the empirical analysis, the Cross-Sectional Augmented Dickey-Fuller (CADF) and Cross-Sectional Augmented IPS (CIPS) unit root tests are applied. These methods are preferred as they allow for heterogeneity in autoregressive coefficients across all

panel units and yield more accurate findings in the presence of cross-sectional dependence (CSD).

The formulation of the CADF test hypothesis is as follows:

"H_o *=There is a unit root in the series.*

H_1*=There is no unit root in the series".*

Table 7

CADF Test Results (Model A)

Model A (Constant)				**Critical Value**		
Variables	t-bar	Z(t-bar)	P-val.	%1	%5	%10
LNGEI	-1.809	-0.193	0.424	-2.300	-2.160	-2.080
LNWPI	-2.869	-5.484	0.000***	-2.300	-2.160	-2.080
LNWAGE	-2.439	-3.339	0.000***	-2.300	-2.160	-2.080
Model A (model with trend)				**Critical Value**		
LNGEI	-1.979	1.922	0.973	-2.780	-2.650	-2.580
LNWPI	-3.751	-7.523	0.000***	-2.780	-2.650	-2.580
LNWAGE	-2.642	-1.611	0.054**	-2.780	-2.650	-2.580

Note. "∗, ∗ ∗ and ∗ ∗ ∗ indicate significance at the 10%, 5%, and 1% level, respectively".

Table 7 presents the results of the fixed model with one lag and the model with a trend. For Model A (constant), the critical values are -2.300 at the 1% , -2.160 at the 5% , and -2.080 at the 10% level. The critical values for Model A (trend) are -2.780 at the 1% , -2.650 at the 5% , and -2.580 at the 10% level.

Table 8 presents the CADF test results for Model B, the fixed model with one lag, and the model with a trend. Unlike Model A, the calculation of Model B is based on the differencing of the series. The results shows that the variables LNGEI, LNWPI, LNWAGE are stationary after the differencing process, both for the constant model and the model with a trend.

Table 8

CADF Test Outcomes (Model B)

Variables	Model B					
	t-bar	Z(t-bar)	P-val.	Critic. Value		
				%1	%5	%10
LNGEI	-3.350	-7.659	0.000***	-2.300	-2.150	-2.070
LNWPI	-4.715	-14.190	0.000***	-2.300	-2.150	-2.070
LNWAGE	-4.157	-11.519	0.000***	-2.300	-2.150	-2.070
Model B (model with trend)						
LNGEI	-3.466	-5.831	0.000***	-2.810	-2.660	-2.580
LNWPI	-4.720	-12.154	0.000***	-2.810	-2.660	-2.580
LNWAGE	-4.336	-10.217	0.000***	-2.810	-2.660	-2.580

Note. "∗, ∗ ∗ and ∗ ∗ ∗ indicate significance at the 10%, 5%, and 1% level, respectively".

CIPS Unit Root Test

Table 9 presents the CIPS test statistic, which is computed by averaging the CADF test statistics. Since the CIPS values are consistently higher than the critical values from the table, this indicates that the structure of the series is stationary (Pesaran, 2007). As a result of these findings, it can be inferred that the series exhibit a stationary structure after differencing all variables.

The hypothesis underlying this test is as follows:

"H_0 : βi = 0, the series is stationary.

H1: βi < 0, the series is not stationary (i=1,2,….,N)"

If the computed t-statistic value surpasses the critical value from the Pesaran (2007) table, the null hypothesis (H_0) is rejected.

Table 9

Outcomes of CIPS Unit Root Test

	Model A (Constant)	Model A (Constant+Trend)	Model B (Constant)	Model B (Constant+Trend)
LNGEI	-1.906	-2.298	-5.015***	-5.070***
LNWPI	-2.774***	-3.398***	-5.146***	-5.291***
LNWAGE	-2.350***	-2.673**	-5.072***	-5.381***
CIPS Critical Value				
%1	-2.3	-2.78	-2.3	-2.81
%5	-2.16	-2.65	-2.15	-2.66
%10	-2.08	-2.58	-2.07	-2.58

Note. The critical values were obtained from the Pesaran (2007) table. Stationarity at the 1% critical value is indicated by ***, at the 5% critical value by **, and at the 10% critical value by *. In this study, the lag length was set to 1.

Panel Cointegration Test Results based on Westerlund (2007)

The Westerlund (2007) test, a panel cointegration test based on the error correction model, is utilized to investigate the cointegration relationship among two or more variables in panel data analysis. A key assumption of the test is that the series are stationary. The cointegration test developed by Westerlund is expressed as:

"$Z(M) = (1 / N) \sum(i=1 \text{ to } N) \sum(j=1 \text{ to } M_{i+1}) \sum(t=T_{ij-1+1} \text{ to } T_{ij}) (S_{it}^2 / (T_{ij} - T_{ij-1})^2 \hat{\sigma}_i^2)$"

In this context, **T** represents the time dimension, **N** denotes the number of units in the panel, and **M** refers to the number of variables.

Table 10 shows the outcomes of the Westerlund (2007) test for the series. Since the test statistics exceed the critical value at the 0.05 level, the null hypothesis of no cointegration is rejected, indicating the presence of a cointegration relationship among the LNGEI, LNWPI, and LNWAGE variables.

Table 10

Westerlund (2007) Test Outcomes

	Stat.	**p-val.**
Variance Ratio	0.7066	0.2399

Following heteroskedasticity-robust panel cointegration test developed by "Chudik & Pesaran (2015)", "Gengenbach et al. (2016)", and "Eberhardt & Presbitero (2015)", the alternative hypothesis, which suggests that there is at least one cointegration relationship among the variables, is accepted. This conclusion is drawn because the probability value is significant at the 1% level. The null hypothesis (H_0) of this test posits that "$p > 0.01$ indicates no cointegration." The obtained result of $p \leq 0.01$, as shown in Table 11, confirms the rejection of the null hypothesis (H0), indicating the presence of a cointegration relationship among gender inequality, women's participation in politics, and women's labor force participation.

"H_0= There is no cointegration relationship between the variables.

H_1= There is a cointegration relationship between the variables."

Table 11

Chudik & Pesaran (2015); Gengenbach, Urbain & Westerlund (2016); Eberhardt & Presbitero (2015) Test Results

d.y.	**Coefficient**	**t-bar**	**P val.**
Y(t-1)	-0.537	-3.503	≤0.01

Long-Run Avarage Coefficients

lngei	Coef.	Std. err.	z	P>|z|	[95% conf.	interval]
lnwpi	-35.14801	30.08901	-1.17	0.243	-94.1214	23.82537
lnwage |	1.327856	2.232653	0.59	0.552	-3.048063	5.703776

Pesaran (2015) CD-Test

	CD	P-val
lngei	35.254	0.000
lnwpi	18.563	0.000
lnwage	17.968	0.000
e	-1.726	0.084

Regression Results

The regression analysis conducted in the study shows that a 1% rise in women's participation in politics results in a 1.46% reduction in gender inequality, as demonstrated in Table 12. Additionally, a 1% rise in female labor force participation contributes to a 2.28% decrease in gender inequality. Since the regression probability values are below 0.05, the model is considered statistically significant.

The strong effect of women's participation in politics and the labor force on gender inequality is clearly evident in the regression results. Considering the content of the variables used in the study, the political implications of these results are that the degree to which women are represented in the legislature and have an equal share of political power, and women's employment as wage and salary earners, is a significant factor in addressing gender inequality, including parameters such as reproductive health, empowerment and economic status.

Table 12

Regression Results

lngei	**Coefficient**	**Std. err.**	**t**	**P>|t|**	**[95% conf.**	**interval]**
lnwpi	-1.469533	.2214426	-6.64	0.000	-1.904328	-1.034739
lnwage	-2.280534	.1898426	-12.01	0.000	-2.653283	-1.907784
|						
_cons	7.908592	.851647	9.29	0.000	6.236413	9.58077

In recent years, the relationship between gender inequality, women's political participation, and female labor force participation has gained increasing attention. The graphs illustrating the trends in gender inequality, the women's political participation index, and female labor force participation rates from 2000 to 2021 in OECD countries are showed in Figure 1. According

to the graph of income inequality, the distribution is concentrated around -2.0. Therefore, according to this information, it shows that most countries have a moderate level of gender inequality. According to the figure of the women's participation in politics index, a large concentration is observed between -0.05 and 0. This shows that women's political participation is higher in some countries than in others. The third graph shows women's participation in the workforce and this distribution is concentrated between 4.4 and 4.6. According to this information, it shows that women's participation in the workforce is relatively equally distributed, in other words, it is at similar levels in most countries. When the three graphs are interpreted together, it indicates that as gender inequality decreases, women's participation in politics and labor force increases.

Figure 1

Gender Inequality, Women's Political Participation Index and Labor Force Participation Rate

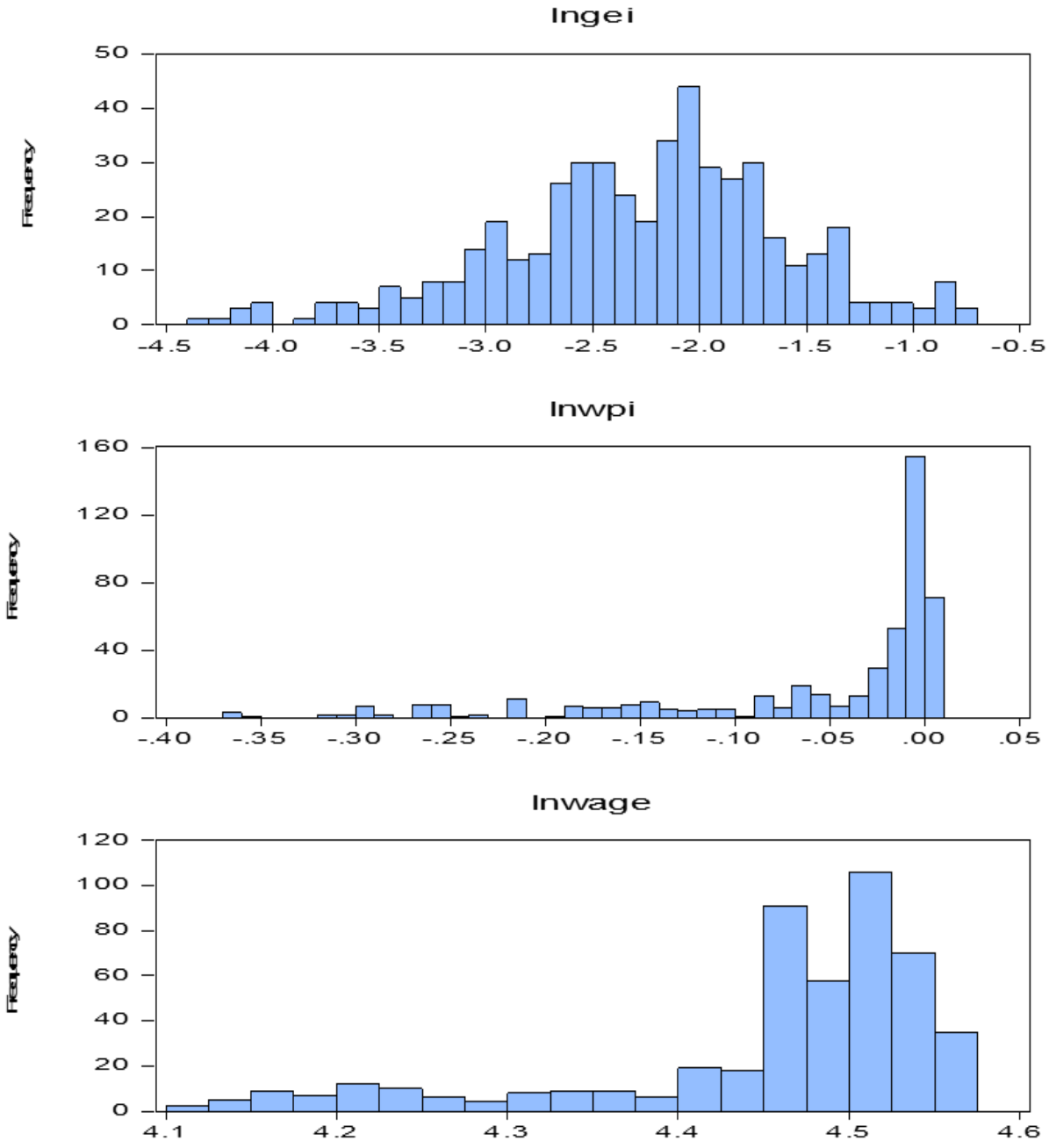
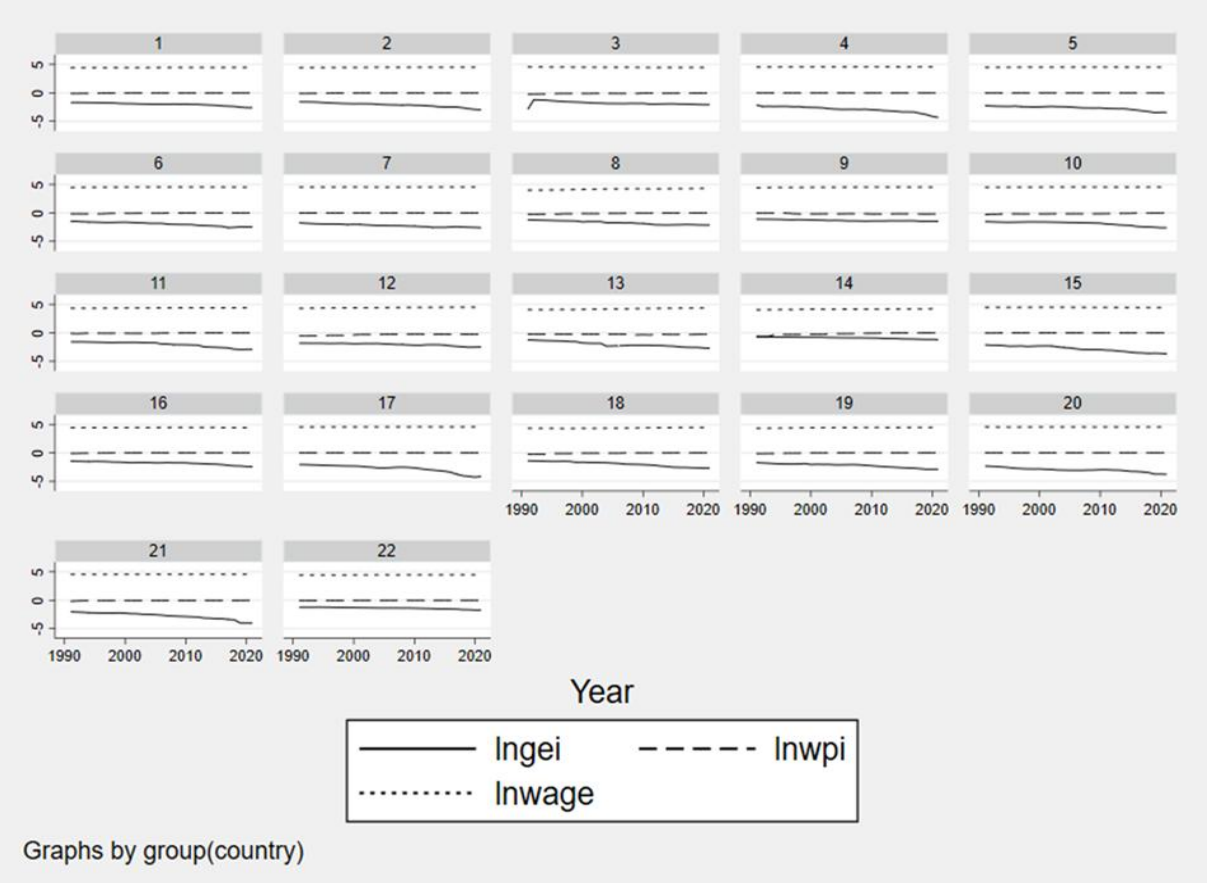


Figure 2 contains information on variables for 22 different countries, taking into account the years 1990-2020. Lngei indicates a solid line, lnwpi indicates a dashed line, and lnwage indicates a dotted line. When all countries are considered, a decrease in gender inequality is observed over the years. When the data on women's participation in politics is taken into account, increases are remarkable in countries 3, 13, and 18 over the years. In general, it shows that women's participation in politics has increased over time. There is also stagnation in the labor force participation data across countries.

Figure 2

Women Political Participation, Female Labor Force and Income Inequality for OECD-22 Countries



Conclusion

This study investigates whether gender inequality in OECD countries can be reduced through increases in women's participation in politics and the labor force. The research question focuses on the period from 1991 to 2021 within the context of OECD member states. Given the presence of cross-sectional dependence and heterogeneity in the data, second-generation panel unit root tests such as the CIPS and CADF tests were employed. In addition, panel causality analyses were conducted using the methodologies proposed by Westerlund (2007), Chudik &

Pesaran (2015), Gengenbach, Urbain, & Westerlund (2016), and Eberhardt & Presbitero (2015). The findings indicate the existence of causal relationships among the variables. Moreover, the regression analysis reveals that a one percent increase in women's political participation results in a 1.46 percent decrease in gender inequality, while a one percent increase in women's labor force participation leads to a 2.28 percent reduction in gender inequality. The gender inequality index used in the study has aspects such as women's reproductive health, empowerment and economic status. The index of women's participation in politics is related to women's representation in legislative bodies and their ability to have equal political power. The women's labor force participation index is related to the employment of women as wage and salary workers. By incorporating a diverse range of variables and offering policy recommendations aimed at addressing gender disparities, this study contributes meaningfully to the literature on gender equality within OECD countries.

The study concludes that as women's participation in politics and the labor force increases, gender inequality decreases correspondingly. This finding underscores that as the rates of these relevant variables rise, the inequalities that women face in various aspects of social life also diminish. The existence of women in decision-making positions within government or parliament enhances the likelihood of implementing policies aimed at eliminating gender inequality. In this regard, women's political participation plays a vital role in shaping legal regulations in areas such as education, health, arts, sports, and trade, ensuring that women's rights are protected. As highlighted in UN reports (United Nations Economic and Social Commission for Asia and the Pacific, 2019), women's effective activity in politics leads to several social benefits, including reduced inequality and prioritization of issues like health, education, parental leave, and retirement. However, as Cairney et al. (2022) observe, politics shapes society but is not wholly determinative and, therefore, may not entirely eliminate inequality on its own. Gender inequalities do not exist in isolation from other socio-economic inequalities. Consequently, the economic power element, as integral to social relations as politics, must also be considered. Dilli et al. (2019) emphasize that investments in education and health are higher in states with more female parliamentarians. Studies also show that women's income provides them with the autonomy to live independently from men, strengthening their bargaining power within the household.

As Tickner (2005) observes, when women enter politics, they are entering a pre-constructed masculine world where role expectations are shaped by qualities traditionally associated with masculinity, such as rationality, autonomy, and power. This dynamic contributes to the underrepresentation of women in the political arena and the free market, even in societies with equal opportunity legislation. Therefore, it is crucial to develop legal frameworks that apply the principle of positive discrimination in areas where women face disadvantages, to effectively minimize gender inequality.

To address this, women should be encouraged to take active roles within political parties, assume executive positions, hold elective public offices, and engage in activities such as election campaigning. States must take proactive steps to warrant women have equal opportunities to access government and parliamentary positions, and positive discrimination should be implemented for female candidates to combat existing inequalities. Furthermore, civil society organizations that advocate for women's rights should be empowered to amplify their voices. To strengthen their impact, these organizations should be granted access to public

communication resources, and financial support should be provided to sustain their operations. States must also revise national education legislation to address gender inequality from the grassroots level.

On the economic front, labor laws should be restructured to provide women with flexible working hours. Additionally, financial incentives should be offered to the free market actors to encourage support for female entrepreneurs. From a political-economic perspective, such initiatives will undoubtedly foster progress in women's health, economic status, and their empowerment in broader social roles.

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