HİTİT SOSYAL BİLİMLER DERGİSİ
Hitit Journal of Social Sciences

e-ISSN: 2757-7949
Cilt | Volume: 18 • Sayı | Number: 1
Nisan | April 2025

Kadın İstihdamının GSYİH Üzerindeki Etkisinin Görünüşte İlişkisiz Regresyon Kullanılarak Değerlendirilmesi

Evaluation of the Impact of Women's Employment on GDP Using Seemingly Unrelated Regression

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Makale Bilgisi | Article Information

Makale Türü | Article Type: Araştırma Makalesi | Research Article
Geliş Tarihi | Received: 21.05.2024
Kabul Tarihi | Accepted: 26.12.2024
Yayın Tarihi | Published: 30.04.2025

Atıf | Cite As

Okay Toprak, A. (2025). Kadın İstihdamının GSYİH Üzerindeki Etkisinin Görünüşte İlişkisiz Regresyon Kullanılarak Değerlendirilmesi. *Hitit Sosyal Bilimler Dergisi, 18*(1), 170-186. https://doi.org/10.17218/hititsbd.1487352

Değerlendirme: Bu makalenin ön incelemesi iki iç hakem (editörler-yayın kurulu üyeleri) içerik incelemesi ise iki dış hakem tarafından çift taraflı kör hakemlik modeliyle incelendi. Benzerlik taraması yapılarak (Turnitin) intihal içermediği teyit edildi.
Etik Beyan: Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.
Etik Bildirim: husbededitor@hitit.edu.tr https://dergipark.org.tr/tr/pub/hititsbd
Çıkar Çatışması: Çıkar çatışması beyan edilmemiştir.
Finansman: Bu araştırmayı desteklemek için dış fon kullanılmamıştır.

Review: Single anonymized-Two Internal (Editorial board members) and Double anonymized - Two External Double-blind Peer Review
It was confirmed that it did not contain plagiarism by similarity scanning (Turnitin).
Ethical Statement: It is declared that scientific and ethical principles have been followed while conducting and writing this study and that all the sources used have been properly cited.
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Conflicts of Interest: The author(s) has no conflict of interest to declare.
Grant Support: The author(s) acknowledge that they received no external funding to support this research.

Evaluation of the Impact of Women's Employment on GDP Using Seemingly Unrelated Regression

Abstract

This study analyzes the impact of women's employment rates on GDP in Hungary, Czechia, Poland, Romania, Bulgaria, and Greece, which have different trends in women's employment in relation to their social structures compared with Western European countries. Although many structural reforms have been implemented in recent years to increase women's employment, the countries considered in this study have lower employment rates, gender inequalities, and interruptions in women's career processes due to gender roles more frequently than in Western European countries. Hungary, Romania, Bulgaria, Czechia, and Poland are among the former Eastern Bloc countries. For this reason, there is an employment structure that comes from the past and differs from Western European experience. The full employment policy and high public expenditures experienced by the former Eastern bloc countries in the past were replaced by efforts to adapt to the free-market economy after the collapse of the Soviet Union. Although Greece has no Eastern Bloc experience, it falls behind Western Europe in terms of chronic problems like unemployment and gender inequalities. Although Greece does not have an Eastern bloc experience, it lags Western Europe in terms of chronic problems, such as high unemployment and gender inequalities. This study aims to examine the relationship between women's employment and GDP from a regional perspective and to suggest policies that can be implemented in this direction. With the help of GDP, female employment rate, urban population ratio, trade as a share of GDP, and final consumption expenditure data of the six countries for the period 1992-2022, estimates were made using the seemingly unrelated regression model (SUR). The SUR used in this study uses the correlation between the error terms in various equations to produce more accurate forecasts. When error terms are correlated, SUR uses this information to produce more accurate parameter estimates. Therefore, SUR is effective for modelling many dependent variables that may be affected by different conditions. In other words, SUR enables more comprehensive testing of economic hypotheses with many interdependent variables. Thus, it is a useful tool for regional analysis. To use the SUR model, the time unit should be at least 30 periods, and the number of units considered should be less than 10. In this study, while the female employment rate was statistically insignificant for Poland, Romania, and Greece, the effect of the female employment rate on GDP in Hungary, Czechia, and Bulgaria was 0.13%, 0.50%, and 0.23%, respectively. According to the general results of the SUR model, a 1% increase in female employment leads to an increase of approximately 0.16% in the GDP. In all the countries included in the study, final consumption expenditure was found to be the variable with the most intensive effect on GDP. This study is unique in that it addresses both the current period interval and econometric methodology used. With the help of the SUR model, both country-specific and holistic results of the six countries in general can be handled.

Keywords: Economic Growth, Women Employment, Gender Inequality, Eastern European Economies, SUR Model

Kadın İstihdamının GSYİH Üzerindeki Etkisinin Görünüşte İlişkisiz Regresyon Kullanılarak Değerlendirilmesi

Öz

Bu çalışma, sosyal ve toplumsal yapıları itibariyle kadın istihdamı konusunda Batı Avrupa ülkelerinden farklı eğilimlere sahip olan Macaristan, Çekya, Polonya, Romanya, Bulgaristan ve Yunanistan'da kadın istihdam oranlarının GSYH üzerindeki etkisini analiz etmektedir. Her ne kadar son yıllarda kadın istihdamını artırmaya yönelik birçok yapısal reform hayata geçirilmiş olsa da bu çalışmada ele alınan ülkelerde Batı Avrupa ülkelerine kıyasla daha düşük istihdam oranları, toplumsal cinsiyet eşitsizlikleri ve toplumsal cinsiyet rolleri nedeniyle kadınların kariyer süreçlerinde kesintilere daha sık rastlanmaktadır. Macaristan, Romanya, Bulgaristan, Çekya ve Polonya eski Doğu Bloku ülkeleri arasında yer almaktadır. Bu nedenle geçmişten gelen ve Batı Avrupa deneyiminden farklılaşan bir istihdam yapısı söz konusudur. Eski Doğu Bloğu ülkelerinin geçmişte yaşadığı tam istihdam politikası ve yüksek kamu harcamaları, Sovyetler Birliği'nin dağılmasının ardından yerini serbest piyasa ekonomisine uyum sağlama çabalarına bırakmıştır. Yunanistan'ın bir Doğu bloğu deneyimi olmamasına rağmen, yüksek işsizlik ve cinsiyet eşitsizliği gibi kronik sorunlar açısından Batı Avrupa'nın gerisinde kalmaktadır. Yunanistan'ın bir Doğu Bloku deneyimi olmamasına rağmen, yüksek işsizlik

ve toplumsal cinsiyet eşitsizliği gibi kronik sorunlar açısından Batı Avrupa'nın gerisinde kalmaktadır. Bu çalışma, kadın istihdamı ve GSYİH arasındaki ilişkiyi bölgesel bir perspektiften incelemeyi ve bu doğrultuda uygulanabilecek politikalar önermeyi amaçlamaktadır. Altı ülkenin 1992-2022 dönemine ait GSYH, kadın istihdam oranı, kentsel nüfus oranı, ticaretin GSYH içindeki payı ve nihai tüketim harcamaları verileri yardımıyla görünüşte ilişkisiz regresyon modeli (SUR) kullanılarak değerlendirmeler yapılmıştır. Bu çalışmada kullanılan SUR tahmincisi, daha doğru tahminler üretmek için çeşitli denklemlerdeki hata terimleri arasındaki korelasyonu kullanmaktadır. Hata terimleri ilişkili olduğunda, SUR bu bilgiyi daha doğru parametre tahminleri üretmek için kullanır. Bu nedenle SUR, farklı koşullardan etkilenebilecek çok sayıda bağımlı değişkenin modellenmesinde etkilidir. Başka bir deyişle SUR, birbirine bağlı çok sayıda değişken içeren ekonomik hipotezlerin daha kapsamlı bir şekilde test edilmesini sağlar. Bu nedenle, bölgesel analiz için kullanışlı bir araçtır. SUR modelini kullanmak için zaman biriminin en az 30 dönem olması ve dikkate alınan birim sayısının 10'dan az olması gerekmektedir. Bu çalışmada, Polonya, Romanya ve Yunanistan için kadın istihdam oranı istatistiksel olarak anlamsız çıkarken, Macaristan, Çekya ve Bulgaristan'da kadın istihdam oranının GSYH üzerindeki etkisi sırasıyla %0,13, %0,50 ve %0,23 olmuştur. SUR modelinin genel sonuçlarına göre, kadın istihdamındaki %1'lik bir artış GSYH'de yaklaşık %0,16'lık bir artışa yol açmaktadır. Çalışmaya dahil edilen tüm ülkelerde, nihai tüketim harcamaları GSYH üzerinde en yoğun etkiye sahip değişken olarak bulunmuştur. Bu çalışma hem cari dönem aralığını hem de kullanılan ekonometrik metodolojiyi ele alması bakımından özgündür. SUR modeli yardımıyla hem ülkeye özgü hem de altı ülkenin geneline ilişkin bütüncül sonuçlar ele alınabilmektedir.

Anahtar Kelimeler: İktisadi Büyüme, Kadın İstihdamı, Toplumsal Cinsiyet Eşitsizliği, Doğu Avrupa Ekonomileri, SUR Model

Introduction

Economic growth is characterized as the sum of several elements including productivity growth, technological advancement, international trade, physical and human capital growth, and foreign direct investment. However, in addition to these aspects of economic growth, long-term viability has become increasingly important. In this scenario, obtaining strong economic growth rates is no longer sufficient, and environmental and social factors must also be considered. To achieve economic growth, it is critical to address issues such as excessive resource use, environmental degradation, and socioeconomic disparity in terms of sustainability. In this regard, it is critical that women, who account for half of the population, are included in the labour force when combining economic growth with sustainability and social welfare indices (Arıcıoğlu and Kutlutürk, 2023, p.1). While GDP is an economic statistic used to evaluate a country's economic performance, it usually includes various data. The total monetary or market worth of all completed goods and services produced inside a nation's boundaries over a specific period is known as the GDP. It is a strong indicator of a country's economic health, and politicians and economists commonly use it to evaluate growth, compare countries, and explain actions. However, GDP has limitations because it ignores economic distribution, environmental impact, and quality of life.

Women's employment is meaningful to GDP for a variety of reasons. Women's employment increases household spending power, which boosts consumption and, ultimately, per capita income. Employment options for women can help to alleviate poverty. Women with access to labor and income can improve their living conditions while also contributing to the economic stability of their families and communities. Poverty reduction improves economic stability and growth. As more women enter the labour force, they tend to have fewer children and devote more time to their education and development. Entrepreneurship fosters innovation, competition, and economic diversification, crucial to long-term financial success. Women have a lower position in poorer countries than in rich ones. Rises in per capita income led to rises in several gender equality indices. This suggests that market failures that prevent

investment in women in developing countries may exist but are typically fixed as development progresses. Religious beliefs, local issues, and civil liberties significantly influence gender differences in health and education. These ongoing gender disparities demonstrate that underinvesting in women is still not a sound business strategy and that gender disparities in educational attainment impede economic growth. Societies that do not invest in girls experience slower growth and lower incomes (Dollar and Gatti, 1999, p.1).

Utilizing the abilities and skills of the entire population, including women, ensures that human resources are fully utilized. When a significant portion of the population is underutilized, it leads to inefficiencies and economic losses. Employing women expands the range of talents and skills used in the economy, resulting in better resource allocation and higher GDP. In conclusion, women's participation in the labour force boosts overall economic growth, while also fostering a more equitable and sustainable economic environment. The feminization U idea is also commonly utilized in the research on women's employment. According to Goldin, the trend of women's labor force participation is U-shaped during the economic development process. According to Goldin, the cause for the downward U-shaped participation curve is a combination of the initially large income effect, the weak substitution effect, and the shift in production site from the house to the factory. Women enter labor at a later stage of economic development, and their social, political, and legal status often improves as the economy advances. The explanations were examined in terms of the change in female schooling relative to boys when educational resource limits were lifted, as well as women's ability to work in the white-collar sector following school graduation. Their higher education and ability to work in more prestigious occupations boosts the substitution effect while reducing the income impact. As the substitution effect begins to surpass the income impact, the upward section of U emerges, ushering in the era of female labor force participation (Goldin, 1995, p.88). This study evaluates the impact of women's employment rates on economic growth in Hungary, Czechia, Poland, Romania, Bulgaria, and Greece, which have similar socio-economic structures and differ from Western Europe in terms of norms regarding women's working lives. Eastern Europe has a structure in which non-individual structural variables become more important because of the Soviet experience. Eastern Europeans' perspectives toward gender and employment possibilities differ from those in Western Europe due to their unique historical experiences. As a result, women's prospects for growth in business are diverse (Hanson and Wells-Dang, 2006, p.17).

This study adds to the extant literature by providing a regional perspective on women's employment in Hungary, Czechia, Poland, Romania, Bulgaria, and Greece. A regional perspective on women's employment is valuable because it reflects social and socioeconomic structural disparities in policy approaches and practices. The influence of women's employment on GDP obtains not just an economic benefit, but also a significant social advantage in terms of boosting overall household living standards. It might be discussed that the countries of southern and eastern Europe, which we examined in this study, can gain both socially and economically from an increase in women's employment to catch up with western Europe in terms of living standards.

1. Literature Review

There is general agreement that there is a positive association between female employment rates, GDP, and GDP per capita. Studies on women's employment, pay disparity, the economic benefits of higher education for women, and the feminization U theory are

prominent. In addition, there are studies in the literature on the impact of disparities in beliefs toward gender roles on women's career opportunities. Dollar and Gatti (1999) investigated if underinvestment in girls' education is a compelling economic decision in developing countries, whether evidence of market failures could contribute to underinvestment in girls' education, and whether these failures reduce as countries grow. The study believes that underinvestment in girls' education is more than just a financial issue and that fundamental societal characteristics like religious preferences and the breadth of civil rights heavily influence gender inequality in education and other areas. The study also concludes these social links make the observed inequality highly unlikely to be economically beneficial. According to the study's model, at lower development levels, gender disparity in schooling has less effect on growth; at higher development levels, it has a greater influence. The economic evidence presented in this study implies governments must pay a price for gender equality through slower growth. The fact that religious variables consistently explain differences in gender inequities suggests that certain societies value inequality and are ready to pay the price for it. The study also concludes that these social linkages make it highly improbable that the observed inequality will be economically advantageous. According to the study's model, gender inequality in education has a negligible impact on growth during lower stages of growth but a more prominent influence at higher stages. The economic evidence presented in this study implies governments must pay a cost for gender equality in terms of slower growth. The fact that religious variables consistently explain gender differences suggests that certain societies value inequality and are ready to pay a price for it (Dollar and Gatti, 1999, pp.2-3).

Knowles et al. (2002) Investigated the implications of gender inequalities in education on development, specifically if increased female schooling leads to higher long-term labor productivity. They constructed a neoclassical growth model with male and female education as independent explanatory variables. The empirical findings indicate female education receives a statistically significant beneficial impact on labor productivity. Male education, on the other hand, sustains an ambiguous impact on labor productivity. Nonetheless, the study's findings indicate that gender gaps in education represent a barrier to economic development, supporting the World Bank's arguments about the importance of female education (Knowless et al., 2002, p.118).

Using data from 184 countries from 1965 to 2004, Luci (2009) concludes that economic growth first reduces women's labor market participation and eventually raises it over time ('feminization U') but emphasizes that relying on economic growth's equalizing effects to enhance women's involvement in the labor force is insufficient in the short run. This study contends that aggressive labor market policies are required to increase women's labor market participation in the interest of general economic growth, particularly in emerging nations (Luci, 2009, p.97)

Klasen and Lamanna (2009) conducted a panel data analysis using data for the period 1960-2000 to investigate the extent to which gender differences in education and employment reduce economic growth. According to the model results, gender differences in employment

increasingly lead to low growth rates in the Middle East, North Africa, and South Asia (Klasen and Lomanna, 2009, p.91)

Thevenon et al. (2010) Investigate the extent to which increases in female human capital, as measured by education, contribute to economic growth in OECD nations. Using data from 30 nations between 1960 and 2008, the study's findings show a rise in women's educational attainment relative to men has a beneficial and significant influence on the growth of output per capita, as measured by GDP. The study emphasizes that increasing the entire population's years of education has a beneficial influence on output per capita growth, as does achieving a more equal education rate by gender (Thevenon et al., 2010, p.39).

Tam (2011) used panel data from almost 130 nations between 1950 and 1980 to show that the U-shaped relationship between labor force feminization and real GDP per capita persists as an intertemporal correlation using dynamic panel data estimation. The study discovers a long-term, U-shaped relationship between real GDPs per capita and labor force feminization. (Tam, 2011, p.140).

Tsani et al.'s (2013) study on the association between female labor force participation and economic growth in Southern Mediterranean nations uses econometric data to confirm the presence of region-specific restrictions. This study uses a general equilibrium model to predict changes in women's labor force participation because of income increases and the removal of region-specific restrictions. The findings suggest that increasing wealth in the first simulation can result in marginally reduced economic growth, whereas removing region-specific restrictions in the second simulation can have a considerably beneficial impact on growth (Tsani et al., 2013, p.323)

Aydın and Erdem (2014) examined the effects of women's employment on economic growth and competitiveness in Turkey and other highly competitive countries in their study from 2014, as identified by the International Governance Development Institute. According to the study's findings, while women's labor force involvement improves competitiveness in more competitive countries, it does not affect competitiveness in any countries investigated, including those that are less competitive. However, participation in the female labor force positively impacted economic growth for all groups (Aydın and Erdem, 2014, p.59)

The long-term effects of gender equality measures on economic growth in Brazil are examined by Agénor and Canuto (2015). They use a three-period OLG model that considers women's allocation of time between market work, child-rearing, human capital accumulation, and household production. The results of the model suggest that promoting gender equality to address intertemporal externalities can significantly impact long-term growth in Brazil (Agenor and Canuto, 2015, p.155).

The significance of investing in women's human capital in the Middle East and North Africa (MENA) is examined by Torabi and Abbasi-Shavazi during the demographic transition, as well as the region's economic development and demographic dividend. Their study seeks to establish the link between women's human capital and economic growth (as measured by gross national income per capita) in MENA. Their results indicate a positive link between the two variables. Lower maternal mortality, better female literacy levels, tertiary education, life expectancy, and professional birth attendance contribute to increased national income. As a

result, they believe investing in women's human capital can help expedite MENA development (Torabi and Abbasi-Shavazi, 2015, p.237).

Saqip et al. (2016) examined the long-term association between women's socioeconomic empowerment and economic growth in Saudi Arabia, using time-series data from 1999 to 2014. The findings indicate a considerable positive association between women's empowerment and long-term economic prosperity (Saqip, Aggarwal and Rashid, 2016, s. 79)

Using data from MENA countries, Eren (2019) investigated the relationship between sectoral female employment and development. Using data from 1991 to 2017 and the panel data analysis method, the study shows unidirectional causality between women's employment in industry and service sectors and development and that the role of women working in industry and service sectors is critical to the development of MENA countries (Eren, 2019, p.106).

Tütüncü and Zengin (2020) use Multi-Fracture Panel Cointegration and Panel Causality tests to examine the association between female employment and economic growth in the E7 countries between 1991 and 2016. The data show a positive cointegration relationship between the variables. The causality test results demonstrate a bidirectional association between the variables in China, India, and Russia, a unidirectional relationship between female employment and economic growth in Indonesia and Turkey, and a unidirectional relationship between economic growth and female jobs in Brazil (Tütüncü and Zengin, 2020, p.1).

Rodriguez-Caballero and Lopez-Marmolejo (2021) examined data from the Dominican Republic, Panama and Central America to see if gender equality in laws increases women's labor force participation and, hence, GDP per capita. Their crucial findings imply that the region's GDP per capita might increase by 0.8 to 1.5 percentage points (percentage points) by enacting gender policies like equal pay for equal labor, paid parental leave, and allowing women to work in all jobs alongside men (Rodriguez-Caballero and Lopez-Marmolejo, 2021, pp.1-3).

The study by Lawin et al. in 2022 investigates the effect on GDP per capita of women's advancement in formal employment. According to the results of the study, which uses data from 40 African countries between 2000-2019 taken from the World Bank database, the proportion of women working in formal paid jobs has positive and significant effects on GDP per capita (Lawin et al., 2022, p.1).

Şahin's (2022) study examined the link between women's employment and economic growth. The panel data model was used to estimate the extent to which women's employment affects economic growth in 31 European nations between 2009 and 2020. The conclusions of the analysis indicate that women's employment has a considerably favorable effect on economic growth (Şahin, 2022, p.277).

Caceres's 2023 study examines the importance of female employment in mobilizing domestic savings, determining the trade account deficit, and addressing the balance-of-payments limitation to growth. According to the study's findings, female employment is a major predictor of external solvency and helps overcome the balance-of-payments limitation on economic growth. The report also highlights the detrimental impact on economic growth of the share of young women who do not study or work. This study underlines the need to encourage women to work to boost economic growth, as well as the policy implications of

adopting steps to help women enter the labor force. In this direction, it is advisable to build national childcare networks, expand early childhood education, improve educational quality, and raise pay (Caceres, 2023, p.107).

2. Data Set and Methodology

The model used in this study analyzes the effect of the women's employment rate on GDP. GDP as the dependent variable and urban population, final consumption expenditure, trade (%GDP), and women's employment-to-population ratio as independent variables. World Bank data are utilized for the dataset covering the years 1992-2022 for Hungary, Czechia, Poland, Romania, Bulgaria, and Greece. Table 1 provides detailed definitions of the variables in the model.

Table 1. Tablo Data Set

Variables	Definition	Resource
GDP (constant 2015 US$)	GDP at the buyer's price is the total gross value added to the economy by all resident producers, plus any product taxes deducted from any subsidies not part of the product's worth.	The World Bank
Employment to population ratio, 15+, female (%) (modeled International Labour Organization estimate)	Female employment refers to the employment rate among females aged 15 and up.	The World Bank
Urban population (% of total population)	The term "urban population" describes the people who reside in regions classified as urban by national statistics offices.	The World Bank
Trade (% of GDP)	Trade, as a proportion of GDP, is the total value of goods and services that are imported and exported.	The World Bank
Final Consumption Expenditure (constant 2015 US$)	Final consumption expenditure is the total household and general government final consumption expenditures.	The World Bank

It is more reasonable to utilize heterogeneous estimators that account for unit correlation. The SUR estimator that we will employ in this work takes into consideration the correlation between the model residuals, allowing the system to be explained while preventing efficiency loss. It is stated that the SUR estimator is appropriate when T(time) is big and unit is less than ten N<10 (Yerdelen Tatoğlu, 2020, p.72). Seemingly Unrelated Regression (SUR) is a useful tool in econometric analysis. This method is used to investigate systems with many regression equations. The dependent variables in each equation may differ, but their error terms (residuals) may be connected. As a result, despite their apparent dissimilarity, the equations may be linked due to their same variance-covariance structure. The SUR approach commonly used to model many connected economic factors. In this context, it is an effective instrument for obtaining precise and dependable data when examining the consequences of monetary policy changes in various regions. To estimate seemingly uncorrelated regression, the regression model is first estimated for each unit separately. The diagonal elements of the variance-covariance matrix show the residual variances of the regression models established separately for each unit, and the off-diagonal elements show the covariance between the residuals (Yerdelen Tatoğlu, 2020, p.73). The mathematical formulation of the SUR model, which considers the n regression equation system, is given below (Zellner, 1962).

$$y_1 = X_1 \beta_{1+} \quad \in_1 \tag{1}$$

$$y_2 = X_2 \beta_{2+} \quad \in_2 \tag{2}$$

$$y_n = X_n \beta_{n+} \quad \in_n \tag{3}$$

y_i is a vector of observations for the dependent variable. X_i is the matrix of independent variables. β_i is the vector of coefficients. $\in_i$ is the vector of error terms. The properties of the error terms are: $E(\in_i \in_j)=\Sigma_{ij}$ for $i \neq j$, Σ is the covariance matrix of the error terms.

2.1. The Model

This study examines the impact of women employment rate on GDP. We use a seemingly unrelated regression (SUR) model. Hungary, Czechia, Poland, Romania, Bulgaria, and Greece are included in the model. The dependent variable of the model is GDP; the control variables are urban population, final consumption expenditure, trade (%GDP), and the other independent variable is the ratio of female employment to population. World Bank data are utilized for the data set covering the years 1992-2022. To reveal how women employment rate affects GDP of these countries, the following model was constructed:

$$\mathrm{lgdp}_{it} = \alpha + \beta_1 lerf_{it} + \beta_2 lup_{it} + \beta_3 ltrd_{it} + \beta_4 lfce_{it} + \varepsilon_{it} \tag{4}$$

The VIF values are presented in Table 2. The VIF value was less than 5; therefore, there was no multicollinearity problem in the model.

Table 2. VIF Value

Variable	VIF	1/VIF
lerf	1.58	0.631777
lup	1.51	0.662273
ltrd	1.48	0.676400
lfce	1.10	0.907132
Mean VIF	1.42	

The model satisfies the normal distribution criteria since the Jacque-Bera value (4.132) is less than 5 and the probability value (0.126) is more than 0.05. A multiple regression model's degree of multicollinearity is evaluated using the Variance Inflation Factor (VIF). When two or more of the predictor variables in the model have a substantial correlation, this is known as multicollinearity, making it impossible to isolate the effect of each predictor on the dependent variable.

Table 3 shows the results of the Swamy, Pesaran, and Yamagato tests, which indicate that the parameters are heterogeneously distributed. Swamy's S Test examines the homogeneity of the coefficients in a random-effects model across multiple cross-sectional units. The Pesaran and Yamagata Delta tests assess the homogeneity of the slope coefficients in large panel data models that are resistant to diverse specifications. Both tests are effective in assessing the consistency and variability of coefficients in panel data models, allowing researchers to decide whether to adopt models that account for cross-sectional heterogeneity.

Table 3. Swamy S, Pesaran and Yamagato Delta Tests

Swamy	chi2(12) =1394.10	Prob chi2=0.0000
Pesaran,Yamagata	Delta	p-value
	13.881	0.000

	Adj.	15.457	0.000

Table 4 shows correlation matrix of residuals. Examining the residual correlation matrix aids in diagnosing potential model flaws, such as autocorrelation, multicollinearity, poor fit, and cross-sectional dependence. Addressing these challenges ensures that the model generates accurate, efficient, and impartial estimates and predictions.

Table 4. Correlation Matrix of Residuals

	lgdp1	lgdp2	lgdp3	lgdp4	lgdp5	lgdp6
lgdp1	1.000					
lgdp2	-0.032	1.000				
lgdp3	0.469	-0.063	1.000			
lgdp4	0.140	-0.252	0.145	1.000		
lgdp5	0.264	0.223	0.124	-0.255	1.000	
lgdp6	0.457	-0.371	-0.192	0.324	-0.044	1.000

According to the Breush-Pagan test results (chi2(25) =1394.10 prob >chi2=0.000), there is correlation between units. Regression models with heteroscedasticity can be identified using the Breusch-Pagan test. One of the core tenets of conventional least squares regression is contradicted by heteroscedasticity, which is the variance of errors varying across all levels of the independent variables. The Breusch-Pagan test investigates the assumption of constant variance in critical mistakes to regression analysis' validity.

Table 5. General Results of the Model

	SURMG	sh	$t_{calculated}$
ltrd	0.1752712	0.018777692	9.33401206
lup	1.0400329	0.379671312	2.739298090
lerf	0.16124875	0.0426379718	3.781810981
lfce	0.7646552	0.023185473	32.97992669
_cons	2.161774416	1.02418087	2.110735007

Table 5 presents the general results of the model. The absolute t-values obtained from the overall results are higher than the table values (1.97); therefore, all the parameters are significant. According to the general results of the model, a 1% increase in trade leads to an increase of approximately 0.17% in the GDP. A 1% increase in urbanization led to an increase of approximately 1.04% in GDP. A 1 per cent increase in female employment leads to an increase of approximately 0.16 per cent in the GDP. A 1 per cent increase in final consumption expenditure leads to an increase of approximately 0.76 per cent in the GDP.

Table 6 presents the results of SUR on a country basis. The first country considered in the model was Hungary. According to the country-based results of the SUR model, all Hungary's variables are statistically significant. A 1% increase in trade led to an increase of approximately 0.18% in GDP. A 1% increase in urban population leads to an increase of approximately 0.64% in GDP. A 1% increase in female employment leads to an increase of approximately 0.13% in GDP, and the last variable, a 1% increase in final consumption expenditure, leads to an increase of approximately 0.74% in GDP. Hungary's economy is relatively strong compared to other nations in the model, like the Czech Republic, and it may provide good job possibilities, particularly in Budapest and other major cities. Hungary's unemployment rate is likewise relatively low, however slightly higher than that of the Czech Republic. Wages are typically lower than in the Czech Republic but higher than in Romania and Bulgaria.

Table 6. SUR model

Equation	R-sq	chi2	P-value
lgdp1	0.994	5971.32	0.000
lgdp2	0.994	5610.94	0.000
lgdp3	0.992	4297.66	0.000
lgdp4	0.995	7823.91	0.000
lgdp5	0.988	2668.00	0.000
lgdp6	0.988	3500.07	0.000
	Coef.	**Std.Err.**	**PZ**
lgdp1			
ltrd1	0.186	0.011	0.000
lup1	0.646	0.136	0.000
lerf1	0.139	0.054	0.011
lfce1	0.747	0.034	0.000
constant	2.487	0.711	0.000
lgdp2			
ltrd2	0.221	0.037	0.000
lup2	-0.086	1.343	0.949
lerf2	0.505	0.159	0.002
lfce2	0.917	0.045	0.000
constant	0.180	5.744	0.975
lgdp3			
ltrd3	0.453	0.091	0.000
lup3	-0.453	1.724	0.792
lerf3	0.130	0.142	0.359
lfce3	0.682	0.109	0.000
constant	8.004	8.820	0.364
lgdp4			
ltrd4	0.039	0.037	0.297
lup4	2.628	0.535	0.000
lerf4	-0.060	0.070	0.388
lfce4	0.720	0.026	0.000
constant	3.007	2.142	0.160
lgdp5			
ltrd5	0.095	0.032	0.003
lup5	2.304	0.284	0.000
lerf5	0.231	0.092	0.012
lfce5	0.447	0.048	0.000
constant	2.476	0.657	0.000
gdp6			
ltrd6	0.056	0.019	0.003
lup6	1.200	0.146	0.000
lerf6	0.020	0.056	0.714
lfce6	1.071	0.030	0.000
constant	3.189	0.791	0.000

The second country considered in the model was Czechia. The second country in the model is the Czech Republic. The results of the analysis conducted for Czechia showed that the trade, female employment, and final consumption variables were statistically significant. A 1% increase in trade leads to an increase of approximately 0.22% in the GDP. A 1% increase in female employment leads to an increase of approximately 0.50% in the GDP. Finally, a

1% increase in final consumption leads to an increase of approximately 0.91% in the GDP. The Czech Republic is one of this group's most economically advanced countries, with a relatively high standard of living and a diverse economy. It can be claimed that it has the advantage of offering higher wages and providing better working conditions than other countries in the model. It also features a labor market that offers chances for talented individuals in various fields.

The third country considered in the model was Poland. In Poland, the third country in the model, only the trade and final consumption variables were statistically significant. The GDP increase was approximately 0.45% for a 1% increase in trade. For a 1% increase in final consumption, the rate of increase in GDP was approximately 0.68%. Poland has comparatively good job possibilities and a more diverse economy with considerable manufacturing, services, and agriculture contributions. Like the Czech Republic, Poland has a relatively active labor market with job prospects for competent people.

The fourth country considered in the model was Romania. In the fourth country, Romania, the significant variables are urbanization and final consumption expenditures. The increase in GDP for a 1% increase in urbanization was approximately 2.62%. The effect of a 1% increase in final consumption expenditure on GDP was approximately 0.72%.

The fifth country considered in the model was Bulgaria. In Bulgaria, all variables are significant. A 1% increase in trade results in a rise of around 0.09% in GDP. A 1% rise in urbanization resulted in an increase of around 2.3% in GDP. A 1% increase in female employment raises the GDP by about 0.23%. A 1% rise in final consumption resulted in an increase of around 0.44% in GDP.

Romania and Bulgaria have more excellent unemployment rates than the Czech Republic, Poland, and Hungary, but lower than Greece's peak. These countries are less economically developed than the Czech Republic, Poland, and Hungary. While they have noted economic progress, they confront obstacles such as reduced earnings and increased unemployment rates. Both have low average pay and varying job quality. These countries have experienced significant skilled migration to Western Europe, influencing the local labor market.

The sixth country considered in the model was Greece. Among the variables of Greece, trade, urbanization, and final consumption variables were significant. A 1% increase in trade leads to a 0.05% increase in GDP. A 1% increase in urbanization led to a increase of approximately 1.20% in GDP. A 1% increase in final consumption led to a 1.07% increase in GDP. Greece's economy is more service-oriented and strongly dependent on the tourism industry. The country has encountered economic challenges, particularly during the debt crisis of the 2010s, which resulted in high unemployment. Although the economy has improved, there are fewer job prospects than in Central European countries. Wages in Greece are under pressure due to economic issues, and work quality might vary, particularly in the seasonal tourism industry. Foreign investment is primarily focused on tourism and real estate, limiting the range of work opportunities. Greece's less active labor market offers fewer opportunities, especially outside major cities and the tourism industry.

Conclusion and Recommendations

The global context supports the elimination of discriminatory attitudes toward adult gender roles. This trend is based on how women's entry into the labor market affects both output

and consumption. Women's paid employment helps drive economic growth and their individual earnings improve household purchasing power. In addition to the economic influence of women's employment in macro and micro contexts, women with economic independence help shape modern social life. However, although there is a global trend toward more female participation in paid work, the process is unequal and inconsistent. Hungary, Czechia, Poland, Romania, Bulgaria, and Greece, which we investigate in this study, endure more ups and downs than Western European countries. Therefore, it can be argued that, in these countries, a higher level of effort is needed to improve women's employment opportunities.

Various issues stand out in the literature on women's employment. The first is equal educational opportunity. Failure to provide equal educational opportunities can lead to an inextricable cycle of poverty for both the female population and society. Labor force participation is directly linked to education, particularly among women. Many studies have shown that education benefits women more than men in terms of employment. Moreover, salary differences between men and women are thought to be smaller in sectors that require more skilled labor. Another perspective on women's employment is the feminization U theory. This argument is based on the observation that attitudes towards gender roles change with economic progress. Women's employment, which is lower in the early stages of economic development, increases in later stages. Women's employment, which declined during the transition from an agricultural to an industrial society, increased as industrialization progressed, and accelerated further with the transition to a knowledge economy. In this context, the increasing number of occupations in the service sector and the expansion of the knowledge economy have had a significant impact on women's employment opportunities.

Policies like childcare leave, flexible employment opportunities, and the growth of childcare services all have a significant impact on women's employment rates. When it comes to children, there are significant differences between men and women. Factors such as access to childcare facilities have a significant impact on women's labor market involvement. Policies that encourage women's employment and the integration of work and family life are effective in increasing women's fertility and labor force participation. These policies include improving access to childcare services, expanding possibilities for education and occupational skill development, and implementing other measures, such as tax breaks, to encourage women's involvement in the labor sector. This balance between paid jobs and household responsibilities makes women less likely to abandon their careers. The sharing of domestic responsibilities among couples also promotes reconciliation. The social structure of societies, as well as religious and traditional family customs, play a role in achieving this reconciliation. The fact that spouses share more frequently in northern and western countries contributes to decreased income inequality between the sexes. The southern and eastern European countries studied in this study can be classified as country groupings in which women work much more unpaid household work than men.

In the literature on women's employment, it is generally accepted that women's employment and economic growth have mutually beneficial effects. This study also presents findings that support this perspective. However, the literature also focuses on the wage inequality between male and female workers, which exists in almost all countries. At this point, it is emphasized that although gender-based wage inequalities persist at most entry and broad

levels of human capital, women can overcome inequality through education. As a result, it can be argued that investments in girls' education have the greatest potential to minimize gender inequalities. In addition to policies that balance paid labor and domestic work, government policies promoting women's education can be seen as a key source of long-term economic growth. Promoting the maximum potential of the female labor force at the national level results not only in economic gains but also in wider living standards. In other words, the presence of women in the workplace not only creates economic value but also has social and psychological consequences and benefits.

Except for Greece, the countries in this study are members of the former Eastern bloc. Therefore, they exhibit various structural similarities. These structural features include similarities in areas such as the gender distribution of jobs, wage inequality, limited flexible working conditions, and the traditional family structure. Despite the lack of Soviet experience, Greece, like the former Eastern European countries, differs from Western Europe in its attitude towards gender. The Czech Republic and Hungary broadly have increased incomes, improved job possibilities, and decreased unemployment rates particularly in skilled areas. Romania and Bulgaria are coming up, although they still confront hurdles due to modest pay and job availability. On the other hand, Greece has a more service-oriented economy, with severer unemployment and fewer work prospects, especially outside of tourism.

Despite modest gains, Eastern and Southern European countries continue experiencing gender imbalances. Women in these regions have lower employment rates than men. The female employment gap is more evident in these nations, where cultural norms and insufficient childcare resources exacerbate inequality. Women are commonly concentrated in certain industries, such as education, health care, and social services. These industries are typically lower-paying and offer fewer opportunities for advancement than male-dominated fields such as engineering and technology. This occupational segregation adds greatly to the persistent gender wage disparities in these areas. Women are more likely to work part-time or informal occupations, frequently due to caring duties. The disproportionate allocation of unpaid care duties for which women are responsible sometimes disrupts or limits their professions. The availability and accessibility of childcare services remain significant barriers to women's full participation in the job market.

When we look at the general results of the countries included in the model, it is seen that the effect of female employment on GDP has a lower impact than the effect of the increase in final consumption expenditure and urban population rate on GDP. In the analysis results, where countries are considered one by one, the countries where female employment is statistically significant are Hungary, Czechia, and Bulgaria, respectively. Czechia is the country where female employment is present in these countries and receives the most significant impact on GDP. The effect of the increase in female employment in Bulgaria and Hungary on GDP is lower than in Czechia. Just as in the general results of the SUR model, the increasing impact of urbanization and final consumption expenditure on GDP in Hungary, Czechia, and Bulgaria is considerably higher than the impact of the increase in female employment rate on GDP. There may be various reasons why the increase in the female employment rate has a limited effect on GDP. The employment of women participating in the labor force in low-wage or low-productivity sectors and their participation in the labor

force part-time or under flexible working conditions can significantly affect the limited effect of the increase in female employment on GDP. However, the fact that women require help to wholly use their skills and qualifications in the new jobs they enter is an essential factor in the failure of economic output to reach its potential level. As an extension of the structural problems experienced by the countries in the study during the transition to the market mechanism, the prevalence of the informal economy can also achieve an increase in the female employment rate that is unfelt in the GDP. Because Southern and Eastern European countries retain a more traditional family structure than other European countries, the exclusion of women from more productive work areas because specific sectors are male-dominated, and others are female-dominated equally affects the effect of the increase in female employment. In addition to the impact of traditional family structures, wage disparities, gender gaps in career advancement opportunities, and stagnant economic conditions may offset the effects of female employment on GDP with broader economic pressures, preventing the predicted growth in female employment from occurring. As a result, it can be stated that there is a specific need for radical changes in the employment structure in Eastern European countries and that gender inequalities in working life are still felt compared to Western European countries. To maximize the potential impact of women's employment on GDP, policies such as closing the gender wage gap, providing affordable, high-quality childcare options so that more women can enter the labor force full-time, facilitating women's re-entry into the labor force after childbirth, and encouraging flexible work arrangements must be implemented. Furthermore, providing vocational training opportunities to assist women in transitioning to higher-paying, higher-productivity jobs, encouraging women's entrepreneurship, promoting gender diversity in traditionally male-dominated sectors, raising awareness of cultural and institutional biases that push women into lower-paying sectors, and expanding anti-discrimination laws will all help to reflect the significant potential of women's employment in economic data.

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