



Araştırma Makalesi • Research Article

The Impact of Globalization on Unemployment: An Empirical Analysis of OECD Countries Using the KOF Index (1990-2021)*

Globalleşmenin İşsizlik Üzerine Etkisi: KOF Endeksi İle OECD Ülkelerinde Ampirik Bir İnceleme (1990-2021)

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MAKALE BİLGİSİ

Makale Geçmişi:

Başvuru tarihi: 12 Mart 2025

Düzeltilme tarihi: 15 Nisan 2025

Kabul tarihi: 21 Mayıs 2025

Anahtar Kelimeler:

Hizmet Kalitesi

Müşteri Memnuniyeti

Yerel Yönetim

ARTICLE INFO

Article history:

Received March 12, 2025

Received in revised form April 15, 2025

Accepted

Keywords:

Globalization

KOF Index

Quantile regression

ÖZ

Bu çalışma, küreselleşmenin işsizlik üzerindeki etkilerini OECD ülkeleri örneğinde 1990-2021 dönemi verileriyle ekonometrik olarak incelemektedir. Küreselleşme; ekonomik, sosyal ve siyasi boyutlarıyla ülkelerin istihdam yapısını derinden etkileyen çok boyutlu bir süreçtir. Çalışmada küreselleşmenin ölçümünde KOF Küreselleşme Endeksi kullanılmış; genel, ekonomik ve ticari küreselleşme düzeylerinin işsizlik oranları üzerindeki etkileri analiz edilmiştir. Ampirik analizde, ilgili döneme ait panel veri seti ve kontrol değişkenleri aracılığıyla, küreselleşmenin işsizlik üzerinde hem olumlu hem de olumsuz etkiler yaratabileceği ortaya konmuştur. Elde edilen bulgular, küreselleşmenin istihdam üzerindeki etkisinin ülke yapısına, gelişmişlik düzeyine ve entegrasyon kapasitesine bağlı olarak farklılık gösterdiğini teyit etmektedir.

ABSTRACT

This study econometrically examines the effects of globalization on unemployment using data from OECD countries for the period 1990–2021. Globalization is a multidimensional process that profoundly influences the employment structure of countries through its economic, social, and political dimensions. In this study, the KOF Globalization Index is used to measure globalization, and the effects of overall, economic, and trade globalization levels on unemployment rates are analyzed. The empirical analysis, based on panel data and control variables for the relevant period, reveals that globalization can have both positive and negative effects on unemployment. The findings confirm that the impact of globalization on employment varies depending on a country's structural characteristics, level of development, and capacity for integration.

1. Introduction

Globalization is defined as the process of integration across economic, social, political, and cultural domains on a global scale, and due to its multidimensional nature, it is widely debated in the international arena (Doğan, 2016). This process has increased the mobility of capital, labor, and services between countries, thereby strengthening interdependence among both developed and developing nations. Labor supply, employment conditions, and working life are also directly affected by globalization (Koray, 1997).

Although indicators such as foreign direct investment and trade openness are commonly used to measure globalization, their limitations have led to the development of the KOF Globalization Index by Dreher (2006), which offers a more comprehensive assessment by incorporating economic, political, and social dimensions. The impact of globalization on employment is one of the core debates in political economy. In developed countries, globalization may lead to job losses in certain sectors, while in developing countries it can contribute to poverty reduction by increasing employment. However, this increase in employment often occurs in low-wage and insecure jobs (Altın et al., 2018).

* This study is derived from a part of Deniz Songur's doctoral dissertation conducted under the supervision of Prof. Dr. Jülide Yalçinkaya Koyuncu at the Department of Economics, Graduate School of Bilecik Şeyh Edebali University.

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Moreover, the expansion of foreign trade, foreign direct investment, and technology transfer during the globalization process has transformed production structures and intensified global competition. Since the 1980s, the acceleration of globalization, particularly in industrial sectors, has forced firms to restructure in response to intense competition and technological change. Diversification of consumer preferences and shortening product life cycles have also affected production processes (Ogunrinola and Osabuohien, 2010).

The effects of globalization upon unemployment vary according to the structural characteristics of each country. According to Ricardo's Theory of Comparative Advantage, free trade promotes specialization and thus increases employment. In contrast, the Heckscher-Ohlin Theory suggests that based on factor endowments, developed countries may experience job losses in labor-intensive sectors as capital-intensive sectors become dominant (Dutt et al., 2009).

In conclusion, globalization can have both positive and negative effects on unemployment. The direction and magnitude of these effects depend on a country's level of development, economic structure, and capacity for global integration (Erer and Erer, 2014).

2. Literature Review

Studies examining the effects of globalization on labor markets hold an important place in the literature.

CM et al. (2025), examine the impact of GDP per capital and economic globalization on unemployment rates in 158 countries during 1991–2019 using the Spatial Durbin Model (SDM). They employ a weighting matrix based on cultural, political, social, linguistic, historical backgrounds, and trade agreements (CPSLHT). Their results indicate that GDP has a significant negative effect on unemployment both in the short and long term. They find that population growth positively affects unemployment, while female labor force participation has a significant indirect negative effect. The effect of net migration is insignificant in the general model but becomes significant in disaggregated globalization models.

Tausch (2010), examines the effects of globalization on unemployment within the framework of world-systems theory. Using data from 1960 to 2009, he analyzes unemployment and economic growth in European countries in relation to the economic penetration of multinational corporations (MNCs). Statistical analyses reveal that the economic penetration of MNCs increases unemployment rates and deepens social inequality in Europe, posing a significant threat to the region's economic growth and social welfare.

Gozgor (2017), analyzes the direct effects of various globalization measures on structural unemployment in 87 countries during 1991–2014. The model is based on the Theory of Comparative Advantage and Heckscher-Ohlin models. Results show that a one standard deviation increase in trade openness reduces structural unemployment by about 0.6 percentage points. The economic, social, and political dimensions of globalization have negative but statistically insignificant effects. Instrumental variable estimations for the Heckscher-Ohlin model were also found to be insignificant.

Dutt et al. (2009), develop a model based on the Heckscher-Ohlin and Ricardo theories of comparative advantage, where unemployment arises from the job search process during 1990–2000. Using country-level data on trade policy, unemployment, and control variables, and controlling for endogeneity and measurement errors, they find a negative correlation between trade openness and unemployment, consistent with the Ricardo model.

Daly et al. (2017), use annual data from 1980 to 2013 to analyze the impact of globalization on unemployment in Pakistan. Using an ARDL framework, they find that the effects of economic, social, and political globalization vary. Political and social integration yield positive short-term results but are associated with rising unemployment in the long term. Economic integration provides limited short-term benefits but significant long-term gains, though long-term cointegration with other globalization factors does not fully offset negative effects.

Altiner et al. (2018), examine the impact of economic globalization on unemployment in 16 emerging market economies during 1991–2014 using the KOF Economic Globalization Index and ILO data. Cross-sectional dependence, unit root, and cointegration tests were applied, confirming a long-term relationship. Results show that economic globalization increases unemployment in Colombia, Hungary, India, Malaysia, Poland, South Africa, and Turkey, while it reduces unemployment in Brazil, China, Indonesia, Mexico, Pakistan, Peru, the Philippines, Russia, and Thailand.

Awad and Youssof (2016), examine Malaysia's labor market response to economic globalization from 1980 to 2014 using the autoregressive distributed lag (ARDL) method. Their findings indicate that economic globalization significantly reduces unemployment rates in Malaysia in the long run.

Erer and Erer (2014), investigates the impact of globalization on unemployment in EU countries during 2000–2012 based on the Ricardian approach. Trade openness and spatial dependence were included in the model. The results indicate that trade reduces unemployment in EU countries.

Pal and Villanthenkodath (2024), examine the impact of economic globalization on unemployment across different income groups between 1991 and 2020. Their results show that globalization increases unemployment in low-income countries, while it reduces unemployment in middle- and high-income countries. Trade and financial openness also have varying effects depending on income level. The study highlights the importance of openness policies to reduce unemployment in low-income countries.

Nwaka (2015), examines the impact of trade policy on unemployment in Nigeria from 1970 to 2010 using the VECM method. Results show that in the long run, real output and per capital income reduce unemployment, while trade openness increases it. External price shocks positively affect unemployment and disrupt equilibrium, whereas in the short run, trade openness and external price shocks reduce unemployment.

Harms and Hefeker (2003), examine the impact of globalization on unemployment through the international diversification of capital income. They find that international

portfolio diversification can reduce unemployment, and when capital income negatively correlates with domestic labor demand shocks, union wages may be lower, leading to higher expected employment.

Gennari and Albuquerque (2011), comparatively examine the effects of economic globalization on labor market changes and new forms of poverty in Portugal and Brazil. In Portugal, globalization increased labor market flexibility and insecurity amid economic crisis and slow growth, while in Brazil, high growth and social policies reduced poverty but labor market issues persisted. In both countries, globalization led to labor market changes and the emergence of new forms of poverty.

Felbermayr et al. (2011), empirically examine the long-term effect of trade openness on the structural unemployment rate using panel data from 20 OECD countries. The results show that trade openness does not increase structural unemployment and even has a positive effect through productivity gains.

3. Data and Methodology

This study empirically examines the relationship between globalization (overall globalization, economic globalization, trade globalization) and unemployment using data from the OECD sample for the period 1990-2021. The control variables used in the model were selected based on those employed by CM et al. (2025:5).

$$UNEMP_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 POP_{it} + \beta_3 FLFPR_{it} + \beta_4 NETMIG_{it} + \beta_5 INF_{it} + \beta_6 GLOB_{it} + \beta_7 GLOBINC_{it} + u_{it} \quad (1)$$

$$UNEMP_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 POP_{it} + \beta_3 FLFPR_{it} + \beta_4 NETMIG_{it} + \beta_5 INF_{it} + \beta_6 ECGLB_{it} + \beta_7 ECGLBINC_{it} + u_{it} \quad (2)$$

$$UNEMP_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 POP_{it} + \beta_3 FLFPR_{it} + \beta_4 NETMIG_{it} + \beta_5 INF_{it} + \beta_6 TRDGLB_{it} + \beta_7 TRDGLBINC_{it} + u_{it} \quad (3)$$

Here, the indices i and t represent the country and time, respectively. The definitions of the variables and their sources are presented in Table 1.

Table 1. Variable and Definitions

Variables	Definition	Source
UNEMP	Unemployment, total (% of total labor force) (national estimate)	WDI
GLOB	General Globalization Index	KOF INDEX
ECGLB	Economic Globalization Index	KOF INDEX
TRDGLB	Trade Globalization Index	KOF INDEX
GDP	GDP (constant 2015 US\$)	WDI
POPULATION	Population aged 15-64, total	WDI
FLFPR	Female labor force participation rate (% of female population ages 15-64) (modeled ILO estimate)	WDI
NETMIG	Net migration	WDI
INFLATION	Inflation, consumer prices (annual %)	WDI
GNI PER CAPITAL	Gross National Income (GNI) per capital	WDI
GLOBINC	Interaction term created by multiplying GLOB and GNI per capital	
ECGLBINC	Interaction term created by multiplying ECGLBINC and GNI per capital	
TRDGLBINC	Interaction term created by multiplying TRDGLBINC and GNI per capital	

The impact of globalization on unemployment is examined within the framework of Ricardo's and Heckscher-Ohlin (H-O) theories. According to Ricardo's theory of comparative advantage, countries specialize in areas where they are most efficient through foreign trade, which can increase employment and reduce unemployment. Openness to trade can particularly raise labor demand in developing countries (Ricardo, 1817). In contrast, the H-O model suggests that countries benefit from trade by utilizing their abundant production factors. However, in developed countries, the prominence of capital-intensive sectors may lead to the contraction of labor-intensive sectors and unemployment among low-skilled workers. Therefore, the effect of globalization on unemployment depends on a country's

economic structure and technological infrastructure (Ohlin, 1933). Table 2 presents the results of the Shapiro–Wilk normality test, while Table 3 shows the results of the Shapiro–Francis normality test. According to the results of both tests, the dependent and independent variables do not follow a normal distribution, as all variables have statistically significant test statistic values. These two test results confirm that it would be more appropriate to use the quantile regression method, which is not affected by the assumption of normal distribution.

Table 2. Shapiro–Wilk Normality Test

	W	V	Z	P-value
UNEMP	0.95628	114.82500	12.43200	0.00000
GLOB	0.98689	61.82600	11.02200	0.00000
ECGLB	0.97249	126.61400	12.92800	0.00000
TRDGLB	0.96595	157.31000	13.50900	0.00000
GLOBINC	0.98655	58.13300	10.82800	0.00000
ECGLBINC	0.98748	53.67100	10.61200	0.00000
TRDGLBINC	0.98626	58.81300	10.85500	0.00000
GDP	0.99790	10.38300	6.26400	0.00000
POP	0.97357	150.59500	13.48000	0.00000
FLFPR	0.83029	568.69100	16.76500	0.00000
NETMIG	0.02888	5541.02200	23.17300	0.00000
INFLATION	0.63201	1513.10300	19.48300	0.00000

Table 3. Shapiro–Francia Normality Test

	W'	V'	Z	P-value
UNEMP	0.95605	124.26800	12.18900	0.00001
GLOB	0.98702	68.26000	11.11400	0.00001
ECGLB	0.97258	140.48700	12.99100	0.00001
TRDGLB	0.96604	174.68900	13.56700	0.00001
GLOBINC	0.98670	63.68900	10.86500	0.00001
ECGLBINC	0.98764	58.64200	10.64300	0.00001
TRDGLBINC	0.98643	64.29800	10.88300	0.00001
GDP	0.99799	11.12600	6.36200	0.00001
POP	0.97368	170.13300	13.69600	0.00001
FLFPR	0.83031	619.51200	16.52300	0.00001
NETMIG	0.02819	6291.40700	23.32500	0.00001
INFLATION	0.63095	1674.82900	19.35000	0.00001

When the series used in a study are non-stationary, there is a risk of encountering spurious regression. Therefore, the stationarity of the series used in this study is first tested. The results of the Fisher Panel unit root test are reported in Table

4. As shown in Table 4, the test statistics for all variables are statistically significant at the 1% significance level. Consequently, the null hypothesis (H0) is rejected for each variable, and the alternative hypothesis is accepted. These test results indicate that the variables are stationary at level.

Table 4. Fisher Panel Unit Root Test (at Level)

H0: All panels contain a unit root.		
Ha: At least one panel is stationary.		
	Test Stat.	P-value
UNEMP	164.22190	0.00000
GLOB	135.57520	0.00000
ECGLB	138.28210	0.00000
TRDGLB	103.84640	0.00000
GLOBINC	138.31180	0.00000
ECGLBINC	147.40020	0.00000
TRDGLBINC	145.81080	0.00000
GDP	95.92770	0.00000
POPULATION	111.45760	0.00000
FLFPR	109.53740	0.00000
NETMIG	129.80840	0.00000
INFLATION	120.43530	0.00000

4. Estimation and Results

The results related to the model using the Overall Globalization Index (based on Equation 1) are presented in Table 5.

4.1. Prediction Result of the Overall Globalization Index

According to Table 5, the GLOB variable has a negative and statistically significant effect on unemployment (UNEMP)

across all quantiles, indicating that overall globalization reduces unemployment. On the other hand, the interaction variable GLOBINC—formed from globalization (GLOB) and per capital income level (GDPPC)—shows a positive and significant relationship with unemployment. This suggests that as economic development increases, production shifts from labor-intensive to technology-intensive sectors, reducing labor demand and thereby increasing unemployment.

Table 5. Quantile regression results for Equation (1)

Quantile(Kantil) ==>	10	20	30	40	50	60	70	80	90
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
GDP	-0.7411	-1.2093	-0.6498	-0.5671	-0.7016	-0.8961	-0.8259	-0.8639	-0.9272
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
POPULATION	0.8599	1.3045	0.8011	0.7205	0.8108	0.9720	0.8748	0.8464	0.8984
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FLFPR	-0.3528	-0.4104	-0.1935	-0.3304	-0.3945	-0.4085	-0.4232	-0.6063	-0.5569
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NETMIG	-1.3120	-1.6304	-2.6188	-2.6358	-2.0453	-2.8599	-1.3138	-0.0457	-0.2666
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0790	0.0250
INFLATION	-1.5570	-0.5132	-0.8891	-0.8943	-0.9823	-1.0063	-0.9966	-1.1745	-1.2446
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GLOB	-0.6956	-0.3740	-0.2336	-0.3860	-0.4369	-0.6223	-0.2352	-0.1208	-0.4593
P value	0.0000	0.0000	0.0020	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000
GLOBINC	0.3369	0.7527	0.1137	0.0750	0.1592	0.2802	0.1887	0.1206	0.2009
P value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of obs:	607	607	607	607	607	607	607	607	607
Number of groups:	19	19	19	19	19	19	19	19	19
Min obs per group:	31	31	31	31	31	31	31	31	31
Max obs per group:	32	32	32	32	32	32	32	32	32
chi2(7)	36000000	8200000	30535	61631	100000	200000	560000000	280000	38300
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

These results align with Ricardo's theory (globalization reduces unemployment) and the Heckscher-Ohlin theorem (unemployment may rise in developed countries). The negative effect of globalization on unemployment fluctuates across quantiles. The strongest negative effect is observed in the 10th quantile, while the weakest is seen in the 80th quantile. Similarly, the positive effect of the interaction variable varies across quantiles, with the highest positive impact at the 20th quantile and the lowest at the 40th quantile.

In terms of control variables; The effect of GDP maintains the same sign across all quantiles but does not display a systematic pattern. The positive impact of population on unemployment varies; the highest effect is observed in the 20th quantile, and the lowest in the 40th. The female labor force participation rate is the most effective variable in reducing unemployment, particularly in the 80th quantile. Net migration has a reducing effect on unemployment, with the strongest negative impact in the 60th quantile and the weakest in the 80th. Inflation plays a role in reducing unemployment, especially in the lower quantiles; its strongest effect is in the 10th quantile and weakest in the 30th.

The results related to the model using the Economic Globalization Index (based on Equation 2) are presented in Table 6.

4.2. Prediction Result of the Economic Globalization Index

According to the data in Table 6, the Economic Globalization (ECGLB) variable has a negative and statistically significant effect on unemployment across all quantiles from the 10th to the 90th. This finding aligns with Ricardo's theory of comparative advantage, indicating that globalization supports employment by increasing trade and productivity.

However, the interaction variable ECGLBINC—formed from ECGLB and per capital income (GDPPC)—is found to be positive and significant across all quantiles. This supports the Heckscher-Ohlin theorem, suggesting that in high-income countries, globalization increases capital- and technology-intensive production, reducing labor demand and raising unemployment.

The strongest unemployment-reducing effect of ECGLB is observed in the 20th quantile (-0.8979), and the weakest in the 80th quantile (-0.0576). The unemployment-increasing effect of ECGLBINC is lowest in the 30th quantile (0.0781) and highest in the 90th quantile (0.3347).

Regarding control variables; GDP is negative and significant in all quantiles, with the strongest effect in the 90th quantile

(-1.0141) and the weakest in the 30th quantile (-0.5342). Population has a positive and significant effect across all quantiles, with the highest in the 80th (1.0132) and the lowest in the 30th quantile (0.6783). Female Labor Force Participation Rate (FLFPR) reduces unemployment across all quantiles; the strongest effect is in the 80th quantile (-0.3849), the weakest in the 30th (-0.1807), and it is marginally significant in the 50th quantile ($p = 0.0650$). Net Migration is generally negative and significant, except in the 90th quantile where it is not statistically significant ($p = 0.3050$); the strongest effect appears in the 30th quantile (-3.0801). Inflation is negative and significant in all quantiles, with the strongest effect in the 10th quantile (-1.4438) and the weakest in the 60th (-0.7811).

Wald tests indicate that the models established in each quantile are statistically significant.

The results related to the model using the Trade Globalization Index (based on Equation 3) are presented in Table 7.

Table 6. Quantile for regression results Equation (2)

[illegible]

4.3. Prediction Result for the Trade Globalization Index

According to the data in Table 7, the Trade Globalization (TRDGLB) variable has a negative and statistically significant effect on unemployment across all quantiles. This supports Ricardo's theory, suggesting that countries opening up to trade specialize based on their comparative advantages, increasing production and reducing unemployment.

However, the interaction variable TRDGLBINC (trade globalization $\times$ per capital income) is positive and significant across all quantiles. This finding aligns with the Heckscher-**Table 7.** Quantile regression results for Equation (3)

Ohlin theorem, indicating that in high-income countries, increased capital-intensive production reduces labor demand and leads to higher unemployment.

The effect of TRDGLB varies across quantiles, with the strongest unemployment-reducing effect observed in the 10th quantile (-0.5953) and the weakest in the 50th quantile (-0.1133). The interaction variable TRDGLBINC shows the strongest positive effect in the 20th quantile (0.7172) and the weakest in the 30th quantile (0.1554).

Table 7. Quantile regression results for Equation (3)

[illegible]

In terms of control variables; GDP is negative and significant across all quantiles, with the strongest effect in the 90th quantile (-1.1167) and the weakest in the 30th (-0.6826). Population is positive and significant in all quantiles, with the highest effect in the 90th quantile (1.0613) and the lowest in the 30th (0.8347). Female Labor Force Participation Rate (FLFPR) reduces unemployment across all quantiles; the strongest effect is in the 40th quantile (-0.4472), and the weakest in the 70th (-0.1390). Net Migration (NETMIG) is negative and significant in all quantiles, with the strongest impact in the 40th quantile (-3.1323) and the weakest in the 90th (-0.8664). Inflation has a reducing effect on unemployment across all quantiles, with the strongest impact in the 10th quantile (-1.3752) and the weakest in the 30th (-0.8124). The statistical significance of the models in all quantiles is confirmed by Wald tests.

5. Conclusion

In this study, the impact of globalization on unemployment was analyzed using panel data from OECD countries for the period 1990–2021, by employing the quantile regression method. Globalization was examined in three dimensions: overall globalization, economic globalization, and trade globalization. In each model, interaction terms representing the relationship between the relevant globalization variable and per capital income (GLOBINC, ECGLBINC, TRDGLBINC) were included.

The overall globalization (GLOB) variable showed negative and statistically significant effects on unemployment across all quantiles, supporting Ricardo's theory of comparative advantage. However, the GLOBINC interaction variable was found to be positive and significant, suggesting that in high-income countries, globalization may lead to a shift from labor-intensive to technology-intensive sectors, thus increasing unemployment—consistent with the Heckscher-Ohlin theorem.

Similarly, economic globalization (ECGLB) showed unemployment-reducing effects across all quantiles. Yet, the ECGLBINC interaction term was positive and significant in every quantile, indicating that as income levels rise, economic globalization may negatively affect employment.

Trade globalization (TRDGLB) also exhibited statistically significant negative effects on unemployment across all quantiles. However, the TRDGLBINC interaction variable was likewise positive and significant in all quantiles, suggesting that trade globalization may increase unemployment in high-income countries by promoting capital-intensive production.

Overall, the quantile regression findings indicate that the effect of globalization on unemployment is not homogeneous; it varies depending on a country's level of unemployment and economic development. Particularly in lower quantiles (countries with lower unemployment), globalization tends to reduce unemployment. while in higher quantiles—especially when combined with income—it may increase it. The control variables align with theoretical expectations: GDP and female labor force participation reduce unemployment, while population growth and some net migration dynamics have a

positive effect on unemployment. Inflation, when low and stable, also plays a role in reducing unemployment.

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