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Research Article

Validity of Okun's Law in Türkiye: Wavelet Analysis

Türkiye'de Okun Kanununun Geçerliliği: Dalgacık Analizi

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Abstract

Okun's law is a fundamental macroeconomic principle that reveals the negative relationship between the unemployment rate and economic growth. This study aims to analyze the validity of Okun's law using general, male, and female unemployment rates covering the period from 2005:Q1 to 2024:Q2 in the Turkish economy, along with Gross Domestic Product (GDP) variables calculated using the production, income, and expenditure methods. Within the methodological framework of the analysis, the Fractional Frequency Fourier ADF (FFFADF) unit root test was first applied to the variables, and then the validity of Okun's law between each GDP variable and each unemployment rate was examined separately using Wavelet Transform Coherence (WTC) analysis. The analysis results provided strong evidence that Okun's law is generally applicable in Türkiye. It has been determined that the relationship is most valid for GDP calculated by the production method, and least valid for the female unemployment rate. More pronounced negative relationships were observed between the male unemployment rate and GDP. These results show that growth and employment dynamics differ depending on the method of calculating GDP and the type of unemployment. In light of the findings, while the role of policies supporting economic growth in reducing unemployment is confirmed, it is emphasized that employment policies, particularly those targeting the male labor force, can have a more pronounced positive impact on GDP, and these dynamics should be considered in policy design.

Keywords: *Okun's Law, Unemployment, Economic Growth, Wavelet Analysis.*

Öz

Okun kanunu, işsizlik oranı ile ekonomik büyüme arasındaki negatif ilişkiyi ortaya koyan temel bir makroekonomik ilkedir. Bu çalışmada, Türkiye ekonomisinde 2005:Q1-2024:Q2 dönemini kapsayan genel, erkek ve kadın işsizlik oranları ile üretim, gelir ve harcama yöntemiyle hesaplanan Gayrisafi Yurt İçi Hasıla (GSYİH) değişkenleri kullanılarak Okun kanununun geçerliliğinin analiz edilmesi amaçlanmıştır. Analizin metodolojik çerçevesinde, değişkenlere yönelik olarak ilk olarak Kesirli Frekanslı Fourier ADF (FFFADF) birim kök testi uygulanmış, daha sonra her GSYİH değişkeni ile her işsizlik oranı arasındaki Okun kanununun geçerliliği, Dalgacık Dönüşümü Tutarlılığı (WTC) analizi ile ayrı ayrı incelenmiştir. Analiz sonuçları, Okun kanununun Türkiye'de genel olarak geçerli olduğuna dair güçlü bulgular sağlamıştır. İlişkinin en fazla üretim yöntemiyle hesaplanan GSYİH ile geçerli olduğu, en az ise kadın işsizlik oranı için geçerli olduğu tespit edilmiştir. Erkek işsizlik oranı ile GSYİH arasında daha belirgin negatif ilişkiler gözlenmiştir. Bu sonuçlar, büyüme ve istihdam dinamiklerinin GSYİH hesaplama yöntemine ve işsizlik türüne göre farklılaştığını göstermektedir. Bulgular ışığında, ekonomik büyümeyi destekleyici politikaların işsizliği azaltmadaki rolü teyit edilmekle birlikte, özellikle erkek işgücüne yönelik istihdam politikalarının GSYİH üzerinde daha belirgin pozitif etkiler yaratabileceği ve politika tasarımında bu dinamiklerin göz önünde bulundurulması gerektiği vurgulanmaktadır.

Anahtar Kelimeler: *Okun Kanunu, İşsizlik, Ekonomik Büyüme, Dalgacık Analizi.*

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1. Introduction

Unemployment and economic growth are fundamental macroeconomic indicators that directly affect a country's social and economic structure and are the primary focus of policymakers. Therefore, these two fundamental indicators play a critical role in determining the level of prosperity of countries.

The phenomenon of unemployment can lead to serious social, cultural, and psychological problems not only at the economic level but also at the individual and societal levels. Stable economic growth can create new employment opportunities, thereby improving quality of life and reducing unemployment rates (Salman and Kılıç, 2019, p. 306). For this reason, empirical studies on the relationship between unemployment and growth can provide important references for policymakers and guide decision-making processes.

When examining empirical studies analyzing the relationship between unemployment and growth, the study conducted by Arthur M. Okun in 1962 stands out and forms the basis for subsequent research. Okun argued that there is a negative relationship between unemployment and the GDP gap; in other words, an increase in unemployment rates will reduce growth. This relationship is referred to in the literature as "Okun's law". Okun (1962) modeled this relationship with equations showing the link between the GDP gap and unemployment. According to Okun, each additional 1% real growth rate will reduce the unemployment rate in the economy by 0.5%.

Studies on the validity of Okun's law show both temporal and regional differences for Türkiye. The literature contains numerous studies using traditional econometric methods such as the Granger causality test (Acar, 2018; Bağcı and Börü, 2018), the ARDL approach (Apaydın and Taşdoğan, 2019; Aydın, 2023), and VAR analysis (Aksoy and İvrendi, 2023). However, due to the static methods they employ, most of these studies fail to fully analyze the dynamic structure of Okun's law and the impact of structural breaks, such as economic shocks, on the relationship. This raises the question of whether Okun's law may have a complex structure that varies over time and frequency, rather than a linear and stationary relationship.

The primary objective of this study is to examine the validity of Okun's law using Wavelet Transform Coherence (WTC) analysis for the period 2005:Q1-2024:Q2 in the Turkish economy, thereby filling this gap in the existing literature. This study provides a multidimensional perspective on Okun's law by disaggregating the relationship between unemployment and economic growth, which should be addressed as a social issue, according to different demographic groups based on gender and different areas of economic activity such as production, income, and expenditure.

To this end, the study seeks to answer the following research questions: Is Okun's law valid in Türkiye for different GDP definitions and for general, male, and female types of unemployment? How does the strength and direction of this relationship change over short, medium, and long-term periods? Does the validity of Okun's law differ during economic crises and other periods of structural disruption? The study's findings are expected to provide new evidence that growth and employment policies exhibit different dynamics based on gender and economic activity. These findings will both open up a theoretical discussion on the dynamic structure of Okun's law and lay the groundwork for policymakers to design more targeted and effective policies. In this respect, the study aims not only to analyze an economic relationship but also to make an important practical contribution to the fields of socio-economics and employment policy.

This study consists of five main sections: after the introduction, it includes a literature review, data set and methodology descriptions, empirical findings, and finally conclusions and policy recommendations.

2. Literature Review

In this section, the validity of Okun's law, in other words, the inverse relationship between unemployment and economic growth, is examined through recent national and international empirical studies conducted in recent years, which are chronologically presented in Table 1.

Table 1: Summary of the Empirical Literature on Okun's Law

Author(s)/Year	Target Country(s)	Sample Period	Analysis Method	Findings
Acar (2018)	Türkiye	2005:Q1-2018:Q3	Granger causality test	Okun's law is valid.
Bağcı and Börü (2018)	Türkiye	1960-1979, 1980-1999 and 2000-2016	Granger causality and correlation tests	Okun's law is valid.

Güçlü (2018)	NUTS Level-2 regions in Türkiye (26 regions)	2004-2014	Pooled Least Squares (LS) method	Okun's law is valid.
Öztürk and Sezen (2018)	Türkiye	2005:Q1-2017:Q3	Engle-Granger cointegration and Granger causality tests	Okun's law is valid.
Yalçınkaya et al. (2018)	Türkiye	2000:Q1-2017:Q4	Ordinary LS method	Okun's law is valid.
Akcan et al. (2019)	OECD	1991-2014	Pedroni cointegration test, Heteroskedasticity LR and Wooldrige type Autocorrelation tests	While there is a relationship from unemployment to growth, there is no relationship from growth to unemployment.
Apaydın and Taşdoğan (2019)	Türkiye	2000:Q1-2016:Q2	ARDL	While Okun's law is not valid for structural unemployment, it is valid for general and cyclical unemployment.
Erdoğan et al. (2019)	Türkiye	1926-1994 and 1995-2015	LS method	Okun's law is valid for the period 1995-2015.
Kenny (2019)	Nigeria	1981-2016	VAR (Vector Autoregression) Granger causality test	There is a unidirectional causality between unemployment and economic growth.
Louail and Riache (2019)	Saudi economy	1991-2017	ARDL	Okun's law is valid.
Sahnoun and Abdennadher (2019)	Algeria, Egypt, Morocco and Tunisia	1965-2016	Johansen cointegration and Granger causality tests	There is a unidirectional causality from economic growth to unemployment.
Salman and Kılıç (2019)	Türkiye	1980-1999 and 2000-2018	VAR Granger causality test	There is no causality relationship between the variables.
Aydın (2020)	10 OECD countries	1969-2018	Kónya (2006) Granger causality test	There is a bidirectional causality relationship between economic growth and unemployment rate in France, Canada, Türkiye and Greece.
Özçelik and Erdem (2020)	Türkiye	1990-2019	LS method and Granger causality test	Okun's law is valid.
Purnomo et al. (2020)	Indonesia	2001-2018	Error Correction Model (ECM)	Okun's law is not valid.
Tüzün et al. (2020)	Türkiye	1990:M1-2017:M4 and 1990:Q1-2017:Q4	MIDAS (Mixed Data Sampling) regression method	Okun's law is valid.
Amankwah et al. (2021)	China	1991-2018	ARDL and Granger causality tests	Okun's law is valid.
Baktemur (2021)	Türkiye	2005:M1-2020:M12	Kapetanios, Shin and Snell (2006) cointegration and Diks and Panchenko (2006) causality tests	There is a long-run unidirectional causality from unemployment to growth.
Koçak (2021)	Türkiye	2005:M1-2020:M9	Mixed Frequency Bayesian Vector Autoregressive Regression model	Okun's law is valid.
Louail and Benarous (2021)	Algeria	1991-2019	ARDL	Okun's law is valid.

Yardımcı (2021)	Türkiye	2001-2020	Johansen cointegration and Granger causality tests	Okun's law is valid.
Çoban and Ulusay (2022)	NUTS Level-2 regions in Türkiye (26 regions)	2004-2020	SYS-GMM Dynamic Model Estimator	Okun's law is valid.
Kızılkaya and Kuzucu (2022)	Fragile Five	1991-2020	Westerlund Durbin-H cointegration and Panel Fourier Toda-Yamamoto causality tests	Okun's law is not valid.
Kolcu and Yamak (2022)	Türkiye	2005:Q1-2020:Q3	LS method	Okun's law is valid.
Aksoy and İvrendi (2023)	Türkiye	2009:Q1-2020:Q4	VAR method	Okun's law is valid for the general and male unemployment rate.
Alper and Kök (2023)	Türkiye	1988-2020	ARDL	Okun's law is not valid.
Aydın (2023)	Türkiye	1980-2021	ARDL	Okun's law is valid.
Balkı (2023)	Türkiye	1988-2022	ARDL	Okun's law is valid.
Bayramoğlu and Aybudak (2023)	Türkiye	2005:Q1-2019:Q2	ARDL	Okun's law is valid.
Tekgün and Eroğlu (2023)	Brazil, India, Russia, South Africa and Türkiye	1991-2019	Panel ARDL	Okun's law is valid.
Nasir et al. (2024)	Malaysia	1988-2021	OLS	Okun's law is valid.
Nene and Matthieu (2024)	Democratic Republic of Congo	1991:Q1-2021:Q4	Bai and Perron (2003) multiple structural change test	Okun's law is valid.
Akcan et al. (2025)	Organisation of Islamic Cooperation countries	1991-2023	Westerlund Panel Cointegration Test and Regife Predictor	Okun's law is valid.
Djamal and Brahim (2025)	Algeria, Tunisia, Morocco, Libya and Egypt	1991-2023	Panel NARDL: MG, PMG and DFE estimators	Okun's law is valid.
López and Cebrara (2025)	Colombia	2010-2022	Difference analysis, dynamic, ECM and VAR analyses	Okun's law is valid.
Malik and Khan (2025)	Ghana	1991-2021	ARDL	Okun's law is not valid.

When evaluating the findings of empirical studies and the methods used, it is observed that different results are obtained regarding the validity of Okun's law. These differences stem from the analysis period used, the data set, or the econometric methodology applied. In this context, a fundamental gap in the existing literature is the absence of a comprehensive study that uses both different GDP definitions and gender-based unemployment data for the Turkish economy and examines the dynamics of this relationship in terms of time and frequency dimensions. This study aims to fill this gap by using the WTC analysis method, which can analyze changes in the relationship between variables at different frequency and time scales more accurately, unlike traditional methods such as Granger causality or ARDL, which are widely used in the literature. Thus, it is believed that the study will make a significant contribution to the literature in terms of both its methodological approach and the breadth of variables considered.

3. Data and Methodology

In this study, general, male, and female unemployment rates, as well as GDP data calculated using production, income, and expenditure methods, were used to test the validity of Okun's law in the Turkish economy. The data were obtained from the Turkish Statistical Institute (TurkStat) database. The analysis variables, consisting

of a total of 78 observations, are quarterly data covering the period 2005:Q1-2024:Q2. Since quarterly data began to be published in Türkiye in 2005, the data for this study were also included in the analysis from this year onwards.

To test the validity of Okun's law, the unit root properties of the variables were first examined using econometric analysis programs and the FFFADF unit root test. While traditional methods assume that economic relationships do not change over time, this assumption may not be valid for a dynamic economy such as Türkiye's. Therefore, the long-term performance of the relationship between the variables was evaluated using WTC analysis, which has the ability to take into account the effects of macroeconomic shocks such as the COVID-19 pandemic or inflation shocks and structural breaks. This method allows for the analysis of the relationship between variables in both the time and frequency dimensions, enabling the dynamics of the relationship in the short, medium, and long term to be revealed. The reason for choosing the FFFADF unit root test and WTC analysis used in the study is that they offer a number of significant advantages over traditional methods. The FFFADF test provides a more robust unit root test by considering periodic structures and structural breaks in the series. The WTC analysis, unlike regression-based methods, allows for the simultaneous analysis of the strength and direction of the relationship between two variables in both the time and frequency dimensions. These features provide an in-depth understanding of how Okun's law behaves during periods such as economic shocks or cyclical fluctuations. However, as with any econometric model, this study has some limitations. Since WTC analysis interprets results by visualizing them, it does not provide a single numerical coefficient as traditional methods do. This may make the interpretation of the quantitative strength of the relationship more open to interpretation. Furthermore, the fact that quarterly data in Türkiye only began in 2005 has limited the possibility of conducting analyses covering longer periods.

Table 2: Description of the Variables

Abbreviation	Name of the variables	Measurement Scale	Source
UN	Unemployment	Seasonally adjusted general unemployment rates	TurkStat
MUN	Male Unemployment	Seasonally adjusted male unemployment rates	TurkStat
FUN	Female Unemployment	Seasonally adjusted female unemployment rates	TurkStat
GDP	Gross Domestic Product by Production Method	Seasonally and calendar adjusted on the gross domestic product in chain linked volume index and percentage change	TurkStat
GDP(INC)	GDP by the Income Method	Seasonally adjusted at current prices by income approach gross domestic product value and percentage change	TurkStat
GDP(EXP)	GDP by Expenditure Method	Gross domestic product in chain linked volume, index and percentage change by expenditure approach	TurkStat

The abbreviation, name, scope and sources of the variables are given in Table 2.

3.1. FFFADF Unit Root Test

The basis of the FFFADF unit root test is the test developed by Enders and Lee (2012). The introduction of this test to the literature was achieved by Bozoklu et al. (2020) by including the decimal values of the frequencies in the model. The FFFADF test allows the frequency counts to be fractional rather than whole numbers. This feature distinguishes the test from the traditional test developed by Enders and Lee (2012). The Fourier ADF test statistic is obtained using the formulation in Equation 1 (Bozoklu et al., 2020, p. 5):

$$\Delta Y_t = \delta_0 + \delta_1 \sin\left(\frac{2\pi kt}{T}\right) + \delta_2 \cos\left(\frac{2\pi kt}{T}\right) + \delta_3 Y_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

Where *t* and *T* represent the trend term and the number of observations, respectively. π= 3.1416, *k* and *p* denote a given frequency and optimal lag length, respectively. Omay (2015) developed the test that allows the

frequency to be fractional in the range k= [0,1,0,2, 0,3, ... ,2]. Bozoklu et al. (2020), on the other hand, expanded this frequency value range to k=[0.1,0.2,…,5] and calculated the critical values for this frequency range using Monte Carlo simulations. Thanks to the test statistics obtained, it is decided whether the variables used in the analysis have a unit root or not by comparing with the critical values (Han, 2021, p. 54).

3.2. WTC Analysis

The Fourier approach has some limitations. In order to overcome these limitations, the wavelet approach is proposed as an important method. The wavelet approach provides more accurately localized temporal and frequency information (Kazak et al., 2024). For this reason, the Wavelet approach, which is a powerful tool in time-frequency analysis, is particularly preferred to analyze the long-term performance of the relationship between the variables used in the study.

Wavelet coherence is defined by Torrence and Webster (1999) as an exact representation of the covariance between variables. Based on Aguiar-Conraria et al. (2008), the Wavelet coherence between two time series (a and b) can be expressed as in Equation 2:

$$R_n(s) = \frac{\left|S\left(s^{-1}\omega_n^{ab}(s)\right)\right|}{S(s^{-1}|\omega_n^a|)^{0,5}S\left(s^{-1}\left|\omega_n^b\right|\right)^{0,5}} \quad (2)$$

Here S represents a smoothing operator at time and scale. Aguiar-Conraria et al. (2008) emphasized that smoothing is a necessary step and argued that without smoothing the coherence would be equal to 1 at all scales and times. For the Morlet wavelet, S can be expressed in terms of time and scale, respectively, as in the following equation:

$$S_t(\omega) = \left(\omega_n(s)^* k_1^{-t^2/2s^2}\right);\ S_{sc}(\omega) = \left(\omega_n(s)^* k_2 \prod\!\!\prod(0{,}6s)\right) \quad (3)$$

In Equation 3, t and sc represent time and scale, respectively, k_1 and k_2 represent normalization constants, and Π represents the rectangle function. The coefficient 0.6 in the equation represents the scale averaging factor empirically determined by Torrence and Compo (1998). The significance of the estimated wavelet coherence was determined using Monte Carlo simulations (Yılancı and Pata, 2023, p. 4975-4976).

4. Empirical Findings

In this section of the study, first, descriptive statistics of the variables are presented and the results of the FFFADF unit root test are interpreted to determine whether economic growth and unemployment variables contain unit roots. Then, the long-term performance of the relationship between the variables is evaluated by WTC analysis.

Table 3: Descriptive Statistics of Variables

	UN	MUN	FUN	GDP	GDP(INC)	GDP(EXP)
Mean	10.4197	9.6218	12.1214	1.2886	5.7056	5.2585
Median	10.1667	9.2500	12.1500	1.4481	3.9169	5.8972
Maximum	14.6667	14.7333	17.5333	16.4117	27.3639	22.3497
Minimum	7.5000	7.0667	7.1333	-10.7133	-8.9545	-14.5409
Std. Dev.	1.7835	1.8081	2.3095	2.8854	6.4928	5.0965
Skewness	0.5352	0.7094	0.0780	0.6445	1.7002	-0.9653
Kurtosis	2.4440	2.7080	2.3253	14.7900	6.5806	7.0411
Jarque-Bera	4.7287	6.8200	1.5585	457.1642	79.2458	65.1890
Probability	0.0940	0.0330	0.4587	0.0000	0.0000	0.0000
Sum	812.7333	750.5000	945.4667	100.5103	445.0359	410.1626
Sum Sq. Dev.	244.9343	251.7374	410.7022	641.0703	3246.0630	2000.0130
Observations	78	78	78	78	78	78

Table 3 presents descriptive statistics on economic growth and unemployment data for Türkiye. According to the data in the table, the mean female unemployment rate is 12.1%, the general unemployment rate is 10.4% and the male unemployment rate is 9.6%. As a result, it was determined that the highest unemployment rate on mean was realized in the female unemployment rate. When the growth data are analyzed, it is concluded that the highest growth rate on mean is GDP calculated by the income method with 5.7%. The study continued with the FFFADF unit root test.

Table 4: FFFADF Unit Root Test Model Results with Constant

	Frequency	Min SSR	F Test Statistics	Optimal Lag	FFFADF Test Statistics	%1 Critical Value	%5 Critical Value	%10 Critical Value
UN	2	95.70619	1.974078	9	-2.19092	-3.94745	-3.2655	-2.90416
DUN	1.9	101.4831	6.601205	8	-5.07957***	-3.97754	-3.29452	-2.92456
MUN	0.8	117.2103	3.063115	8	-3.06141	-4.52538	-3.91682	-3.61466
DMUN	3.4	117.7526	3.071905	7	-2.78263*	-3.69646	-3.02004	-2.67743
FUN	4	213.5268	2.54429	6	-7.62319***	-3.62706	-2.96557	-2.63443
GDP	3.8	546.4126	3.583266	1	-7.58732***	-3.63742	-2.98106	-2.64321
GDP(INC)	0.1	1825.074	6.559602	1	-4.68428***	-4.49046	-3.88278	-3.58259
GDP(EXP)	3.8	1148.539	4.735081	3	-5.31791***	-3.63742	-2.98106	-2.64321

Note: * and *** Critical values indicate 10% and 1% significance level, respectively.

Table 4 presents the results of the FFFADF unit root test for the model with constant term. Since general and male unemployment variables are not stationary at the level, they are made stationary by taking the first difference. The FFFADF test statistic value of the female unemployment variable was calculated as -7.6. Since this value is significant at the 1% level, it means that the female unemployment variable does not contain a unit root and is therefore stationary. The calculated FFFADF test statistic values of the GDP variables calculated by production, income and expenditure method are -7.5, -4.6 and -5.3, respectively. Since these values are significant at the 1% level, it is determined that these series are stationary.

Table 5: FFFADF Unit Root Test Model Results with Constant and Trend

	Frequency	Min SSR	F Test Statistics	Optimal Lag	FFFADF Test Statistics	%1 Critical Value	%5 Critical Value	%10 Critical Value
UN	1.9	88.46021	8.148782	8	-5.12991***	-4.71084	-4.08096	-3.75104
MUN	1.9	100.4963	9.392997	8	-5.65674***	-4.71084	-4.08096	-3.75104
FUN	2	108.6109	3.100198	8	-2.40106	-4.6981	-4.0393	-3.69946
DFUN	3.5	116.2905	2.857174	7	-2.95093	-4.33841	-3.68688	-3.34675
DDFUN	4	213.4157	2.545159	6	-7.61291***	-4.30546	-3.64124	-3.30119
GDP	3.8	543.3474	3.745555	1	-7.58622***	-4.32422	-3.65693	-3.31667
GDP(INC)	0.8	1767.372	4.048743	1	-4.8038**	-4.92747	-4.33115	-4.03156
GDP(EXP)	3.8	1144.4	4.853203	3	-5.32379***	-4.32422	-3.65693	-3.31667

Note: ** and *** Critical values indicate 5% and 1% significance level, respectively.

According to the FFFADF unit root test results for the constant and trend model in Table 5, the FFFADF test statistic values of the general and male unemployment variables are calculated as -5.1 and -5.6, respectively,

and since these values are significant at the 1% level, it is determined that there is no unit root. Since the female unemployment variable was not stationary at the level, it was made stationary by taking its second difference. The FFFADF test statistic values of the GDP variables calculated by the production, income and expenditure method are greater in absolute value than the critical table values at all significance levels, in other words, it is concluded that the series are stationary since they do not contain unit roots. The study continued with the WTC analysis.

Figure 1: WTC Analysis of GDP and UN Series

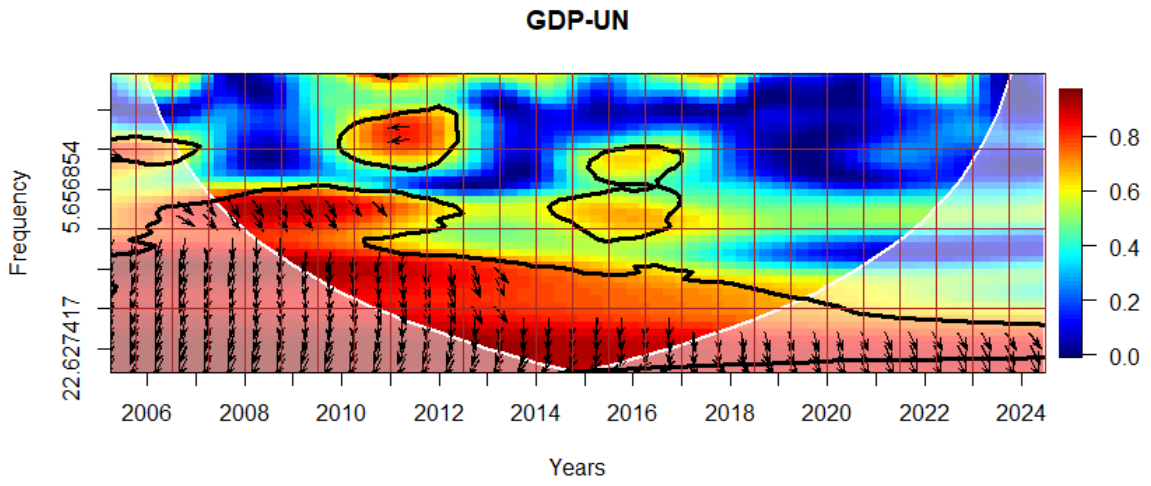


Figure 1 shows the relationship between GDP calculated by the production method and the general unemployment rate. In the figures, red represents high coherence, while yellow, green, and blue represent low coherence. The shapes formed by the black lines represent the areas of influence, and the arrows within them provide information about the direction of the influence. Arrows pointing downwards or to the left imply a negative relationship between the variables, while arrows pointing upwards or to the right imply a positive relationship between the variables. All figures in the analysis are evaluated within this framework. There is a high frequency, significant and negative relationship between these two variables throughout the analysis period. In the early part of the analysis period, significant and negative relationships were also observed at the medium frequency level, while high frequency negative relationships were observed towards the end of the analysis period. Therefore, it has been determined that there is a negative relationship between the two variables in question throughout the entire analysis period as the direction of the arrows is downward and to the left, and thus Okun's law is valid.

Figure 2: WTC Analysis of GDP and MUN Series

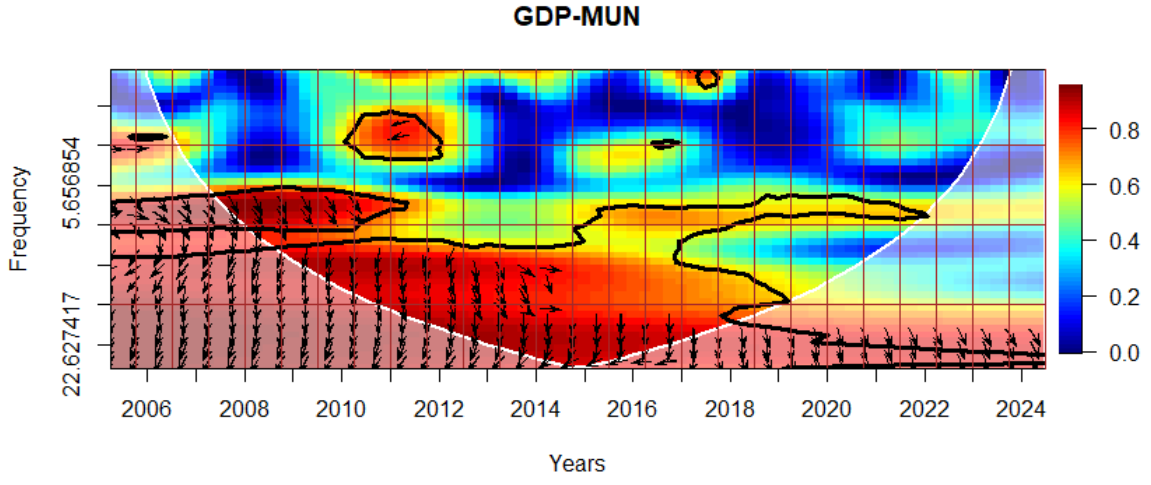
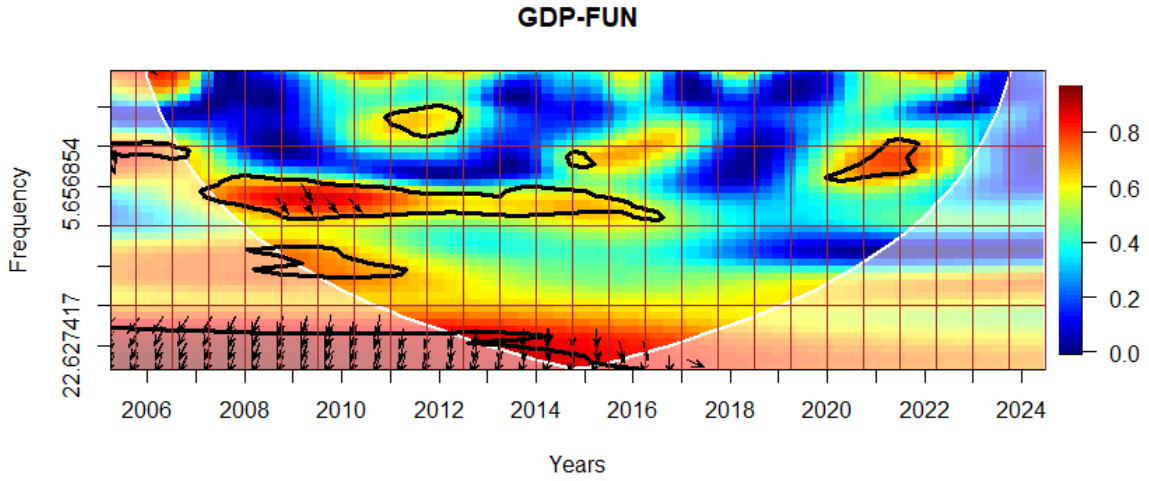


Figure 2 shows the relationship between GDP calculated by the production method and male unemployment rate. There is a strong and negative relationship between GDP calculated by the production method and male

unemployment rate at high frequency for the entire analysis period and at medium and high frequency from the beginning to the middle of the analysis period. Therefore, there is evidence that Okun's law is valid between GDP calculated by the production method and male unemployment rate.

Figure 3: WTC Analysis of GDP and FUN Series



The relationship between GDP by production method and female unemployment rate is shown in Figure 3. While there was a high-frequency significant and negative relationship between GDP by production method and female unemployment rate from the beginning of the analysis period until 2016, the significant relationship between the variables disappeared after 2016. Therefore, it is concluded that Okun's law is valid between GDP by production method and female unemployment rate since the direction of the arrows is downward between 2005-2016. Okun's law has lost its validity after 2016 between GDP and female unemployment variable by production method.

Figure 4: WTC Analysis of GDP(INC) and UN Series

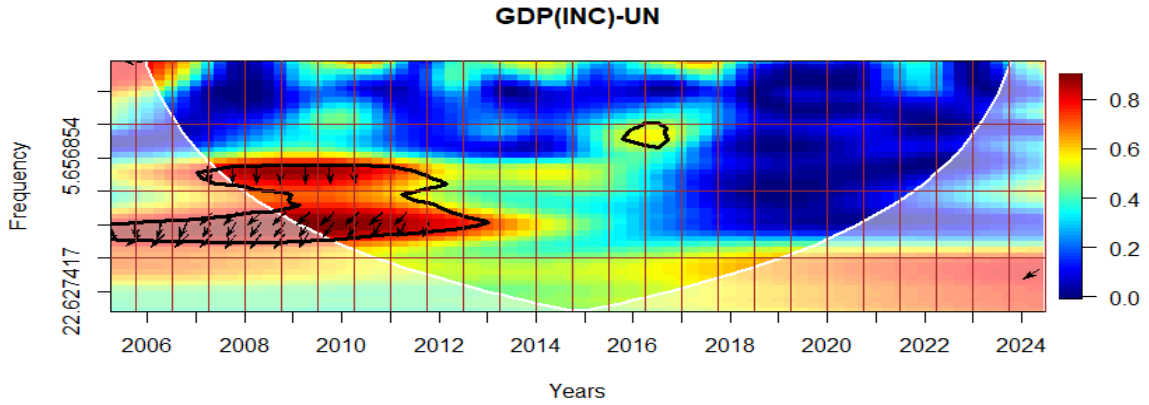
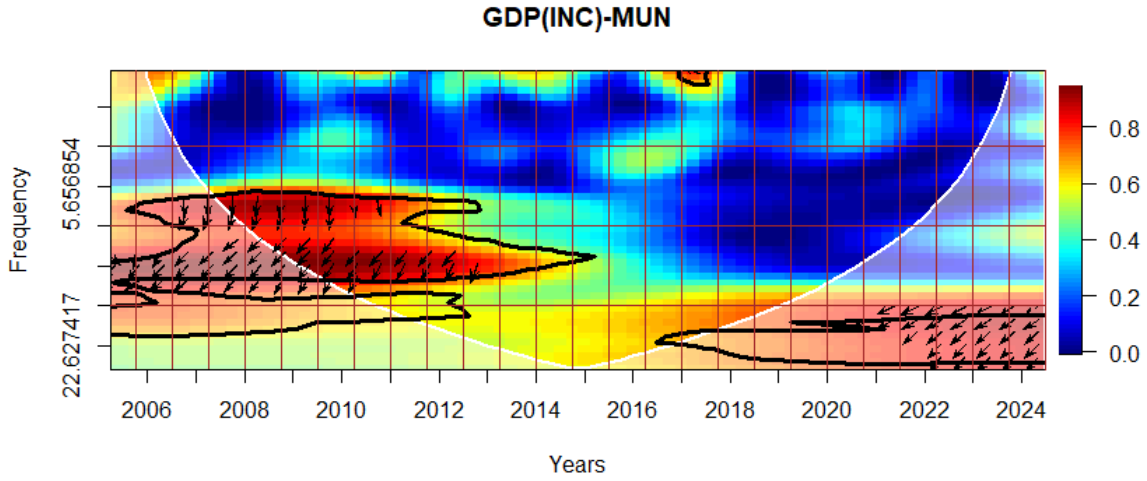


Figure 4 above analyzes the relationship between GDP calculated by the income method and the general unemployment rate. From the beginning of the analysis period until 2012, there is a medium frequency and negative relationship. Therefore, since the direction of the arrows points downwards at the beginning of the analysis period, there is evidence that Okun's law is valid. However, there is no evidence that Okun's law is valid from 2012 to 2024. Finally, after 2024, there is a high-frequency negative relationship, as the direction of the arrow points downwards and to the left. Therefore, it is concluded that Okun's law is valid between GDP calculated by the income method and the general unemployment rate from 2005 to 2012 and after 2024.

Figure 5: WTC Analysis of GDP(INC) and MUN Series



According to the analysis results presented in Figure 5, which shows the relationship between the GDP variable calculated using the income method and the male unemployment rate, a medium-frequency negative and significant relationship was identified during the period from the beginning of the analysis period in 2005 to 2013. In addition, a high frequency and negative relationship was detected in the period after 2021 until the end of the analysis period. Therefore, in the period from 2013 to 2021, no relationship was found for the validity or invalidity of Okun's law. As a result, Okun's law, which was valid at medium frequency at the beginning of the analysis period, changed itself as Okun's law valid at high frequency towards the end of the analysis period.

Figure 6: WTC Analysis of GDP(INC) and FUN Series

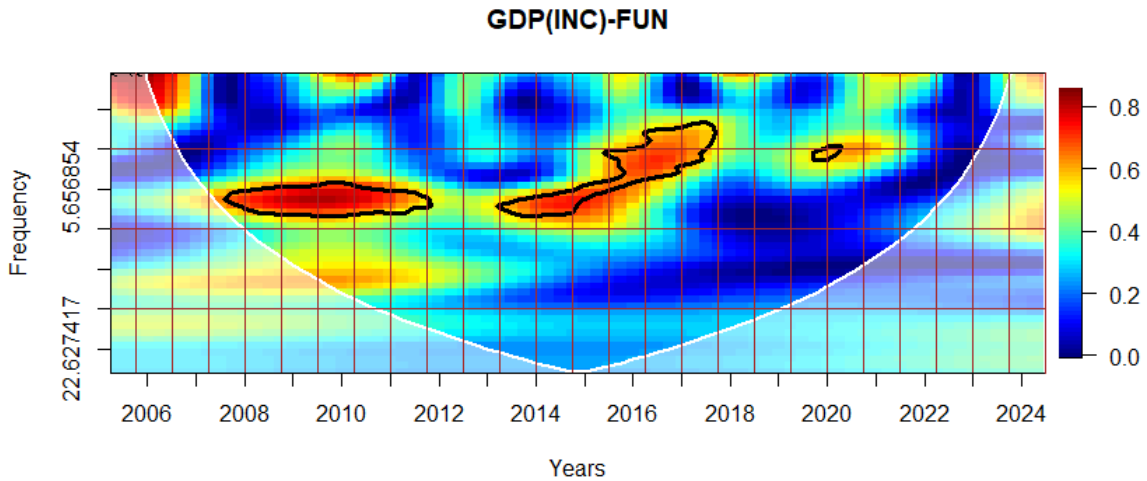
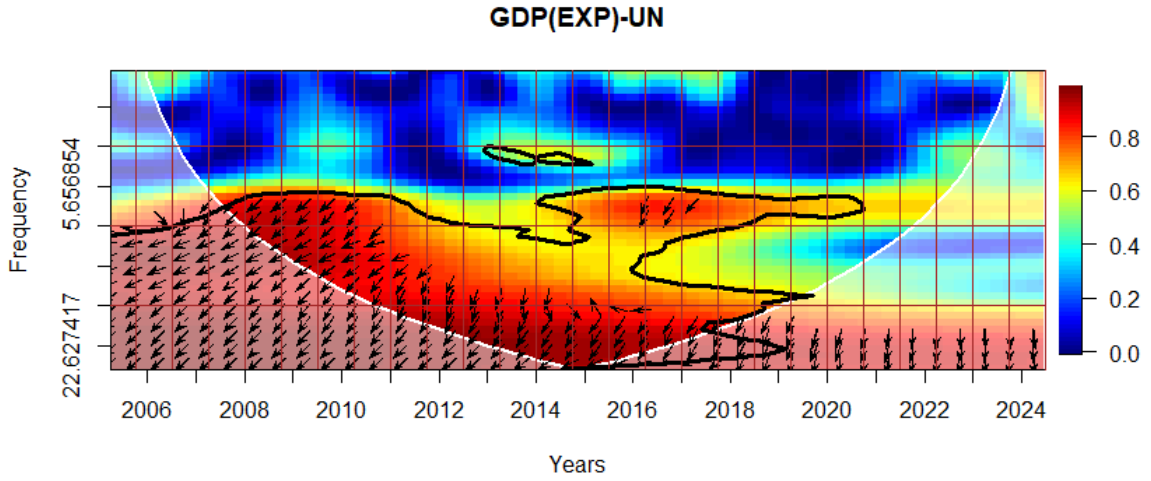


Figure 6 analyzes the relationship between GDP calculated by the income method and the female unemployment rate. An analysis of the overall figure reveals that there is a significant relationship at a medium frequency between 2007 and 2012, between 2013 and 2018, and in 2020. However, the dose of this significant relationship is not sufficient to give the direction of the relationship. Therefore, no relationship could be detected between the GDP variable calculated by the income method and the female unemployment rate variable in terms of whether Okun's law is valid or not.

Figure 7: WTC Analysis of GDP(EXP) and UN Series



When the relationship between GDP calculated using the expenditure method and the general unemployment rate data, as shown in Figure 7, is evaluated, a significant and negative relationship was found at a high frequency throughout the entire analysis period, and at a medium and high frequency at the beginning and middle of the analysis period. Therefore, this negative relationship between GDP calculated by expenditure method and general unemployment rate proves the validity of Okun's law.

Figure 8: WTC Analysis of GDP(EXP) and MUN Series

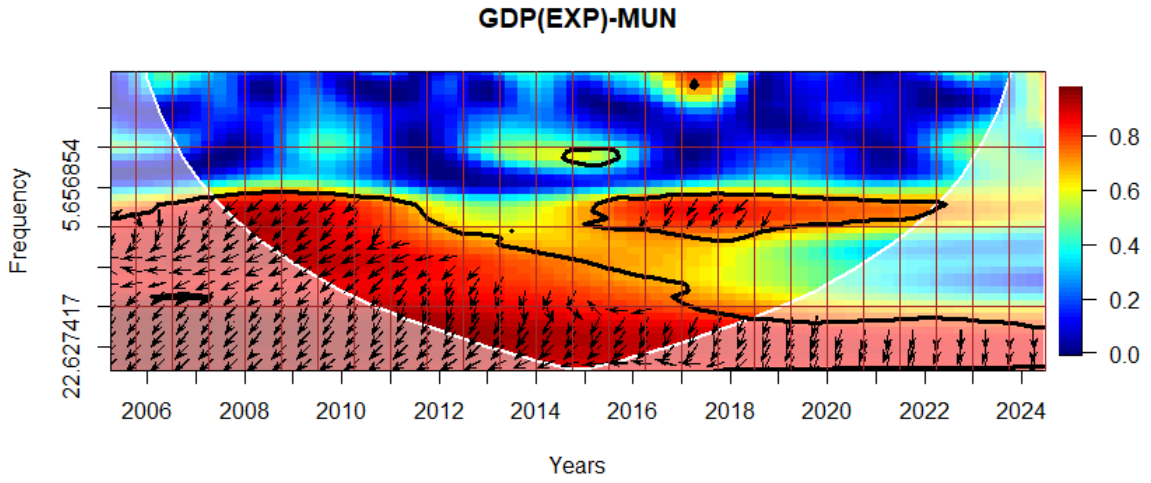
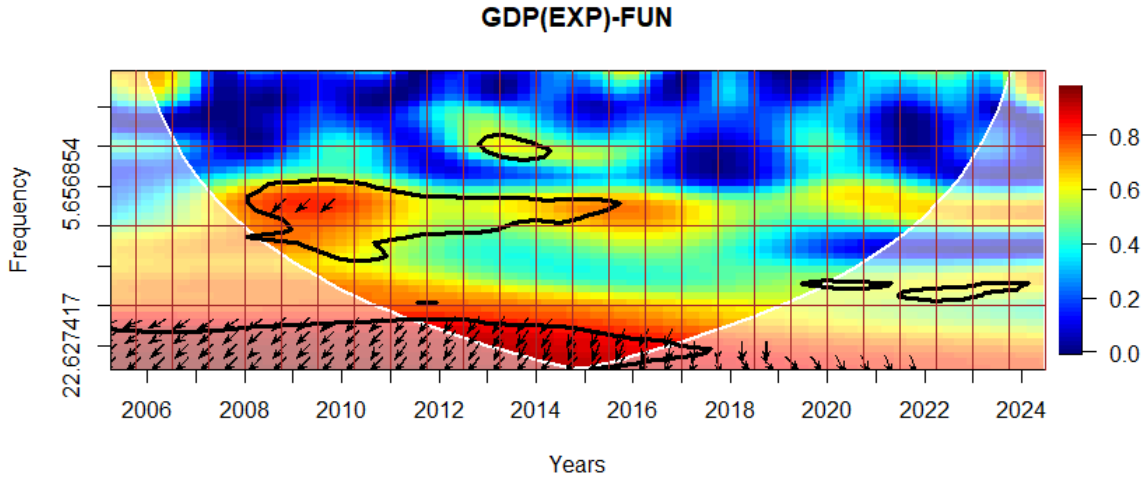


Figure 8 shows the relationship between GDP calculated by the expenditure method and male unemployment rate. It is found that these two variables are negatively correlated at high frequency in the entire analysis period and at medium frequency from the beginning and middle of the analysis period until 2019. Therefore, since the direction of the arrows points downwards between the GDP variable calculated by the expenditure method and the male unemployment rate, Okun's law is valid.

Figure 9: WTC Analysis of GDP(EXP) and FUN Series



Finally, according to the analysis results of the relationship between GDP calculated by the expenditure method and the female unemployment rate presented in Figure 9, a high-frequency negative relationship was identified between GDP calculated by the expenditure method and the female unemployment rate from the beginning of the analysis period until 2022, as the arrows point downwards. There is also a negative relationship between GDP calculated by expenditure method and female unemployment rate at medium frequency between 2008 and 2010. Therefore, it is determined that Okun's law is valid between GDP calculated by expenditure method and female unemployment rate from the beginning of the analysis period until 2022. However, from 2022 until the end of the analysis period, there is no finding that the Okun law is valid or not valid.

5. Conclusion and Policy Recommendations

This study examines the validity of Okun's law in the Turkish economy using GDP data calculated using production, income, and expenditure methods, along with general, male, and female unemployment rates for the period 2005:Q1-2024:Q2, employing the WTC analysis method. The analysis results show that there are generally significant relationships between the variables examined and that Okun's law is largely valid. The findings reveal a strong and consistent negative relationship between GDP calculated using production and expenditure methods, especially at high and medium frequencies, and the general and male unemployment rates.

These findings are consistent with studies specific to Türkiye, such as Acar (2018), Bağcı and Börü (2018), Koçak (2021), Çoban and Ulusay (2022), and Aydın (2023), as well as studies in other countries, such as Amankwah et al. (2021), Louail and Benarous (2021), Nene and Matthieu (2024), and López and Cebrara (2025). However, it differs from studies such as Purnomo et al. (2020), Kızılkaya and Kuzucu (2022), Alper and Kök (2023), and Malik and Khan (2025), which argue that Okun's law does not hold. These findings are generally consistent with studies conducted in other countries, as well as those specific to Türkiye. However, these findings differ from traditional approaches that argue the relationship is static. The findings show that Okun's law does not always operate in the same way in Türkiye, exhibiting a dynamic structure depending on economic shocks and fluctuations at different frequencies. This provides empirical evidence for theoretical discussions on Okun's law.

When the findings from the analysis are examined, a more intense and consistent negative relationship between the male unemployment rate and GDP components is observed compared to other unemployment categories. This finding is related to the fact that male unemployment is more prevalent in sectors such as manufacturing, construction, and industry, which are generally the sectors that contribute most to GDP. Therefore, this stronger statistical relationship reflects the current sectoral and gender-based structure of the labor market in Türkiye rather than the data itself. In light of these findings, strategic recommendations can be made for determining employment and unemployment policies in Türkiye. First and foremost, the general validity of Okun's law confirms that sustainable and inclusive economic growth is a fundamental tool for reducing unemployment. Second, the findings statistically suggest that policies targeting male unemployment rates may have a more pronounced potential impact on GDP. This result should be considered as an indication that specific employment policies, such as vocational training, skills development programs, and SME support for sectors

with high male labor intensity, may yield faster and stronger results in increasing GDP. However, this finding does not diminish the importance of employment policies targeting female and other segments of society. Ultimately, inclusive employment policies targeting all segments of society should continue to be implemented, but taking into account sectoral and gender-based labor market dynamics can make policy design more effective.

Finally, the time-frequency information provided by wavelet analysis indicates that policy effects may differ in the short and long term. Therefore, considering the cyclical dynamics of the relationship between unemployment and growth and their responses at different frequencies, it would be beneficial to design both quick-response short-term policies and more structural and sustainable long-term solutions together. A key limitation of this study is the restricted analysis period due to quarterly GDP data for Türkiye only being available from 2005 onwards. Analysis of a longer time series could provide more definitive results regarding the long-term dynamics of the relationship. Furthermore, panel data analyses that examine the validity of Okun's law in greater depth, taking into account sectoral and regional differences using sectoral GDP and unemployment data, could be interesting topics for future studies.

References

Acar, Y. (2018). Türkiye'de Ekonomik Büyüme-İşsizlik Oranı İlişkisi: Bir Nedensellik Analizi. *Sosyal, Beşeri ve İdari Bilimler Alanında Yenilikçi Yaklaşımlar Cilt 2*, 43-56, Gece Kitaplığı: Ankara.

Aguiar-Conraria, L., Azevedo, N., & Soares, M. J. (2008). Using Wavelets to Decompose the Time-Frequency Effects of Monetary Policy. *Physica A: Statistical Mechanics and Its Applications*, *387*(12), 2863-2878. https://doi.org/10.1016/j.physa.2008.01.063

Akcan, A. T., Arık, M., & Azazi, H. (2025). Testing the Validity of Okun's Law in Islamic Cooperation Organization Countries: Panel Data Analysis. *Journal of Economic Cooperation and Development*, *46*(1), 209-240.

Akcan, A. T., Yılmaz, K. Ç., & Alptekin, V. (2019). Analyzing Relationship between Unemployment and Growth for Selected OECD Countries Through Panel Data. *Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *26*(3), 727-744. https://doi.org/10.18657/yonveek.594142

Aksoy, N., & İvrendi, M. (2023). Türkiye'de Ekonomik Büyümenin Cinsiyet ve Eğitim Temelinde İşsizliğe Etkisi. *Journal of Yaşar University*, *18*(69), 172-192. https://doi.org/10.19168/jyasar.1188216

Alper, F. Ö., & Kök, M. (2023). Türkiye'de Enflasyon-İşsizlik-Ekonomik Büyüme İlişkisi: Ekonometrik Bir Analiz. *Niğde Ömer Halisdemir Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *5*(2), 130-141. https://doi.org/10.56574/nohusosbil.1320149

Amankwah, E., Wilson, A., Boahene, M. A., & Osei-Koduah, E. (2021). The Impact of Unemployment on Economic Growth in China. *International Journal of Arts and Social Science*, *4*(1), 262-281.

Apaydın, Ş., & Taşdoğan, C. (2019). Yapısal ve Konjonktürel İşsizlik Çerçevesinde Okun Yasası Üzerine Bir Gözlem. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, *15*(1), 61-76. https://doi.org/10.17130/ijmeb.2019149859

Aydın, A. (2023). Türkiye Ekonomisi İçin 1980 Sonrasında Enflasyon ve Büyümenin İşsizlik Üzerindeki Etkileri: ARDL Yaklaşımı. *Sosyal Bilimlerde Nicel Araştırmalar Dergisi*, *3*(1), 1-22.

Aydın, E. K. (2020). The Relationship between Unemployment and Economic Growth in OECD Countries: Panel Causality Test. *Turkish Studies - Economics, Finance, Politics*, *15*(1), 267-276. https://doi.org/10.29228/TurkishStudies.39258

Bağcı, E., & Börü, M. K. (2018). Ekonomik Büyüme ve İşsizlik Arasındaki İlişki: Türkiye'de Ekonometrik Bir Analiz. *International Journal of Academic Value Studies*, *4*(22), 890-897. https://doi.org/10.23929/javs.816

Bai, J., & Perron, P. (2003). Computation and Analysis of Multiple Structural Change Models. *Journal of Applied Econometrics*, *18*(1), 1-22. https://doi.org/10.1002/jae.659

Baktemur, F. İ. (2021). Türkiye'de İşsizlik ile Ekonomik Büyüme Arasındaki Doğrusal Olmayan Eşbütünleşme ve Nedensel İlişki. *Academic Review of Humanities and Social Sciences*, *4*(2), 169-183. https://doi.org/10.54186/arhuss.975440

Balkı, A. (2023). Unemployment, Inflation, and Economic Growth Nexus in Türkiye: Evidence from the ARDL Method. *2. BİLSEL International World Science and Research Congress*, 184-191, Bilgesina Yayınevi: İstanbul.

Bayramoğlu, A. T., & Aybudak, H. G. (2023). Türkiye Ekonomisinde Okun Yasası'nın Geçerliliği: Genel İşsizlik ve Tarım Dışı İşsizlik Oranı Üzerinden Karşılaştırmalı Bir Analiz. *Fırat Üniversitesi Sosyal Bilimler Dergisi*, *33*(2), 783-797. https://doi.org/10.18069/firatsbed.1219093

Bozoklu, Ş., Yılancı, V., & Görüş, M. Ş. (2020). Persistence in Per Capita Energy Consumption: A Fractional Integration Approach with a Fourier Function. *Energy Economics*, *91*, 1-12. https://doi.org/10.1016/j.eneco.2020.104926

Çoban, S., & Ulusay, N. (2022). Türkiye'de Bölgesel Düzeyde İşsizlik ve Ekonomik Büyüme Arasındaki İlişkinin Analizi: Yaş ve Cinsiyet Asimetrisi Var Mı? *International Social Mentality and Researcher Thinkers Journal*, *8*(62), 1484-1493. https://doi.org/10.29228/smryj.64028

Diks, C., & Panchenko, V. (2006). A New Statistic and Practical Guidelines for Nonparametric Granger Causality Testing. *Journal of Economic Dynamics and Control*, *30*(9-10), 1647-1669. https://doi.org/10.1016/j.jedc.2005.08.008

Djamal, D., & Brahim, L. O. (2025). Asymmetric Effect of GDP on Unemployment in North African Group Countries According to Okun's Law. *Futurity Economics & Law*, *5*(1), 4-23. https://doi.org/10.57125/FEL.2025.03.25.01

Enders, W., & Lee, W. (2012). The Flexible Fourier Form and Dickey-Fuller Type Unit Root Tests. *Economics Letters*, *117*(1), 196-199. https://doi.org/10.1016/j.econlet.2012.04.081

Erdoğan, S., Yıldırım, D. Ç., Çevik, N. K., & Ünal, Ö. T. (2019). Okun Yasasının Geçerliliği: Türkiye'den Ampirik Bulgular. *Maliye Dergisi*, 177, 70-86.

Güçlü, M. (2018). Türkiye'de Yaş Gruplarına ve Cinsiyete Göre İşsizliğin Ekonomik Büyümeye Etkisi. *Ege Akademiş Bakış*, *18*(3), 399-407. https://doi.org/10.21121/eab.2018339489

Han, A. (2021). Hisse Senedi Fiyatlarının Ortalamaya Dönüşü: Kesirli Frekanslı Fourier ADF Birim Kök Testi. *Düzce İktisat Dergisi*, *2*(1), 49-62.

Kapetanios, G., Shin, Y., & Snell, A. (2006). Testing for Cointegration in Nonlinear Smooth Transition Error Correction Models. *Econometric Theory*, *22*(2), 279-303. https://doi.org/10.1017/S0266466606060129

Kazak, H., Saiti, B., Kılıç, C., Akcan, A. T., & Karataş, A. R. (2024). Impact of Global Risk Factors on the Islamic Stock Market: New Evidence from Wavelet Analysis. *Computational Economics*, *65*(6), 3573-3604. https://doi.org/10.1007/s10614-024-10665-7

Kenny, V. S. (2019). A Causal Relationship between Unemployment and Economic Growth. *MPRA Paper*, No. 93133. https://ideas.repec.org//p/pra/mprapa/93133.html

Kızılkaya, O., & Kuzucu, H. (2022). Kırılgan Beşli Ülkeleri Üzerine Okun Yasasının Geçerliliğinin Sınanması. *Full-Text Book of International Symposium of Economics Finance and Econometrics*, 84-95.

Koçak, N. A. (2021). Karma Frekanslı Veriler ile Okun Kanunu: Türkiye Örneği. *Bankacılar Dergisi*, 117, 156-169.

Kolcu, F., & Yamak, N. (2022). Türkiye'de İşsizlik ve Ekonomik Büyüme İlişkisi. *Journal of Yaşar University*, *17*(65), 134-148. https://doi.org/10.19168/jyasar.931206

Kónya, L. (2006). Exports and Growth: Granger Causality Analysis on OECD Countries with a Panel Data Approach. *Economic Modelling*, *23*(6), 978-992. https://doi.org/10.1016/j.econmod.2006.04.008

López, D. A. C., & Cabrera, J. A. L. (2025). Empirical Evidence for Okun's Law in Colombia: An Analysis of Rural Areas at the Region Level. CEPAL Review No. 145, ECLAC, 107-125.

Louail, B., & Benarous, D. (2021). Relationship between Economic Growth and Unemployment Rates in the Algerian Economy: Application of Okun's Law During 1991-2019. *Organizations and Markets in Emerging Economies*, *12*(1), 71-85. https://doi.org/10.15388/omee.2021.12.48

Louail, B., & Riache, S. (2019). Asymmetry Relationship between Economic Growth and Unemployment Rates in the Saudi Economy: Application of Okun's Law During the Period 1991-2017. *International Journal of Advanced and Applied Sciences*, *6*(10), 83-88. https://doi.org/10.21833/ijaas.2019.10.013

Malik, A. A., & Khan, A. U. I. (2025). COVID-19 and the Okun's Law: The Case of Ghana. *Cogent Economics & Finance*, *13*(1), 2460074. https://doi.org/10.1080/23322039.2025.2460074

Nasir, S., Jamaludin, S., Safian, S. S. S., Malek, N. A., & Aziz, M. R. A. (2024). Revisiting Okun's Law: Evidence from Malaysia. *Information Management and Business Review*, *16*(3), 551-561. https://doi.org/10.22610/imbr.v16i3(I)S.4082

Nene, M. M., & Matthieu, M. M. (2024). Okun's Law Using Structural Change with Threshold Approach: Empirical Evidence from the Democratic Republic of Congo (DRC). *Journal of Economics and International Finance*, *16*(2), 16-27. https://doi.org/10.5897/JEIF2024.1215

Okun, A. M. (1962). Potential GNP: Its Measurement and Significance. *American Statistical Association Proceedings of the Business and Economic Statistics Section*, 98-104.

Omay, T. (2015). Fractional Frequency Flexible Fourier Form to Approximate Smooth Breaks in Unit Root Testing. *Economics Letters*, *134*, 123-126. https://doi.org/10.1016/j.econlet.2015.07.010

Özçelik, Ö., & Erdem, C. (2020). İşsizlik ve Ekonomik Çıktı İlişkisi: Türkiye İçin Okun Yasası ile İncelenmesi. *Econder International Academic Journal*, *4*(2), 326-341. https://doi.org/10.35342/econder.739598

Öztürk, S., & Sezen, S. (2018). Ekonomik Büyüme ile İşsizlik Arasındaki İlişkinin Analizi: Türkiye Örneği. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *15*(41), 1-14.

Purnomo, D., Kusumastuti, N., Anas, M., Aisyah, S., & Shaari, M. S. (2020). Evaluating the Economy Growth by Supply Chain Strategies and Testing the Validity of Okun's Laws in Indonesia. *International Journal of Supply Chain Management*, *9*(1), 826-831. https://doi.org/10.59160/ijscm.v9i1.4407

Sahnoun, M., & Abdennadher, C. (2019). Causality between Inflation, Economic Growth and Unemployment in North African Countries. *Economic Alternatives*, 1, 77-92.

Salman, G., & Kılıç, J. (2019). Türkiye'de İşsizlik ve Ekonomik Büyüme Arasındaki İlişki: 1980-2018 Dönemi İçin Ekonometrik Bir Uygulama. *Ekonomi İşletme ve Maliye Araştırmaları Dergisi*, *1*(4), 305-334. https://doi.org/10.38009/ekimad.627198

Tekgün, B., & Eroğlu, İ. (2023). How Okun's Law Works in Fragile Five Countries: Panel Data Analysis. *Uluslararası Ekonomi ve Yenilik Dergisi*, *9*(2), 273-288. https://doi.org/10.20979/ueyd.1338162

Torrence, C., & Compo, G. P. (1998). A Practical Guide to Wavelet Analysis. *Bulletin of the American Meteorological Society*, *79*(1), 61-78. https://doi.org/10.1175/1520-0477(1998)079<0061:APGTWA>2.0.CO;2

Torrence, C., & Webster, P. J. (1999). Interdecadal Changes in the ENSO-Monsoon System. *Journal of Climate*, *12*(8), 2679-2690. https://doi.org/10.1175/1520-0442(1999)012<2679:ICITEM>2.0.CO;2

Tüzün, O., Ekinci, R., & Ceylan, F. (2020). Okun Yasasının MIDAS Regresyon ile Analizi: Türkiye Örneği. *İzmir İktisat Dergisi*, *35*(1), 53-60. https://doi.org/10.24988/ije.202035104

Yalçınkaya, Ö., Daştan, M., & Karabulut, K. (2018). Okun Yasası Bağlamında Ekonomik Büyüme ve İşsizlik Arasındaki İlişkinin Ekonometrik Analizi: Türkiye Ekonomisinden Kanıtlar (2000:Q1-2017:Q4). *Uluslararası Ekonomi Siyaset İnsan ve Toplum Bilimleri Dergisi*, *1*(1), 8-27.

Yardımcı, M. C. (2021). Okun Yasasının Geçerliliğinin Sınanması: Türkiye Örneği. *Eurasian Academy of Sciences Social Sciences Journal*, *39*, 80-95. https://doi.org/10.17740/eas.soc.2021.V39-07

Yılancı, V., & Pata, U. K. (2023). COVID-19, Stock Prices, Exchange Rates and Sovereign Bonds: A Wavelet-Based Analysis for Brazil and India. *International Journal of Emerging Markets*, *18*(11), 4968-4986. https://doi.org/10.1108/ijoem-09-2021-1465

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Araştırma Makalesi

Validity of Okun's Law in Türkiye: Wavelet Analysis

Türkiye'de Okun Kanununun Geçerliliği: Dalgacık Analizi

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Genişletilmiş Özet

Okun kanunu, işsizlik oranı ile ekonomik büyüme arasında negatif bir ilişki olduğunu ileri süren temel bir makroekonomik ilkedir. Bu çalışma, Türkiye ekonomisinde 2005:Q1-2024:Q2 dönemini kapsayan genel, erkek ve kadın işsizlik oranları ile üretim, gelir ve harcama yöntemiyle hesaplanan GSYİH değişkenlerini kullanarak bu kanunun geçerliliğini analiz etmeyi amaçlamaktadır. İşsizlik ve ekonomik büyüme, ülkelerin sosyal ve ekonomik yapısını doğrudan etkileyen ve politika yapıcıların öncelikli olarak odaklandığı temel makroekonomik göstergelerdendir. İşsizlik, aktif nüfus içinde yer almasına rağmen iş arayan ancak bulamayanların oluşturduğu iktisadi bir sorun olarak tanımlanırken, büyüme bir ülkedeki toplam üretim miktarındaki artışı ifade eder. Dolayısıyla bu iki temel gösterge, ülkelerin refah düzeyini belirlemede kritik bir rol oynamaktadır. İşsizlik olgusu, sadece ekonomik değil, aynı zamanda bireysel ve toplumsal düzeyde ciddi sosyal, kültürel ve psikolojik problemlere yol açabilmektedir. İstikrarlı bir ekonomik büyüme sayesinde yeni istihdam alanları yaratılarak yaşam kalitesi yükseltilebilir ve işsizlik oranları azaltılabilir. Bu nedenle işsizlik ve büyüme arasındaki ilişki üzerine yapılan ampirik çalışmalar, politika yapıcılara önemli referanslar sunarak karar alma süreçlerine yön verebilmektedir. İşsizlik ve büyüme arasındaki ilişkiyi analiz eden ampirik çalışmalar incelendiğinde, Arthur M. Okun tarafından 1962 yılında gerçekleştirilen çalışma ön plana çıkar ve sonraki araştırmalara temel oluşturur. Bilindiği kadarıyla WTC analiz yöntemini ve analizde kullanılan değişkenlerin tamamını kullanarak güncel verilerle Türkiye ekonomisi için Okun kanununun geçerliliğini bu denli kapsamlı ve ayrı ayrı analiz eden bir çalışma ile literatürde karşılaşılmamıştır. Bu yönüyle çalışmanın mevcut literatüre önemli bir katkı sağlayacağı düşünülmektedir.

Çalışmada, Türkiye ekonomisine ait 2005:Q1-2024:Q2 dönemini kapsayan çeyreklik veriler kullanılmıştır. Veri seti, TÜİK veri tabanlarından temin edilen genel, erkek ve kadın işsizlik oranları ile üretim, gelir ve harcama yöntemleriyle hesaplanmış GSYİH serilerini içermektedir. Analiz kısmında değişkenlerin birim kök içerme durumları FFFADF birim kök testi kullanılarak test edilmiş, ardından büyüme ile işsizlik oranı arasındaki ilişkinin zaman ve frekans boyutundaki dinamiklerini ortaya koymak için WTC analizi uygulanmıştır. WTC analizi, geleneksel zaman serisi yöntemlerinin aksine zaman ve frekans boyutunda dinamik ilişkileri inceleme olanağı sunmasıyla çalışmanın metodolojik özgünlüğünü ve literatüre katkısını sağlamaktadır. Analiz sonuçları genel olarak değerlendirildiğinde; genel, erkek ve kadın işsizlik oranları ile GSYİH'nin farklı hesaplama yöntemlerine ait değişkenler arasında anlamlı ilişkilerle karşılaşılmış ve Okun kanununun büyük ölçüde geçerli olduğu tespit edilmiştir. Elde edilen anlamlı ilişkiler incelendiğinde, erkek işsizlik oranı ile GSYİH kalemleri arasında diğer işsizlik kategorilerine göre daha yoğun ve tutarlı bir negatif ilişki söz konusu olduğu görülmektedir. Çalışmanın genelinde Okun kanununun geçerli olduğuna dair güçlü kanıtlar tespit edilse de ekonomik büyümeye katkı potansiyeli açısından erkek işsizlik oranındaki değişimlerin GSYİH üzerindeki etkisinin daha belirgin olduğu bulgulanmıştır. Bulgular, Okun kanununun en fazla geçerli olduğu ilişkinin üretim yöntemiyle hesaplanan GSYİH ile olduğu sonucunu ortaya koyarken, en az geçerli olduğu işsizlik oranının ise kadın işsizlik oranı olduğu tespit edilmiştir. Bu sonuçlar, Türkiye ekonomisinde büyüme ile istihdam arasındaki dinamiklerin, kullanılan GSYİH hesaplama yöntemine ve işsizlik türüne göre farklılıklar gösterdiğini işaret etmektedir.

Bu bulgular ışığında, Türkiye'de istihdam ve işsizlik politikalarının belirlenmesinde bazı stratejik öneriler sunulabilir. Öncelikle, Okun kanununun genel geçerliliği, sürdürülebilir ve kapsayıcı ekonomik büyümenin işsizliği azaltmada temel bir araç olduğunu teyit etmektedir. Bu doğrultuda, üretimi, yatırımları ve ihracatı teşvik eden makroekonomik politikaların kararlılıkla sürdürülmesi büyük önem taşımaktadır. İkinci olarak, bulgular, erkek işsizlik oranının azaltılmasına yönelik uygulanacak politikaların GSYİH üzerinde daha belirgin bir pozitif etki yaratabileceğini göstermektedir. Bu bağlamda, özellikle erkek işgücünün yoğun olduğu sektörlere yönelik teşvikler, mesleki eğitim ve beceri geliştirme programları, işgücü piyasası esnekliğini artırıcı düzenlemeler ve küçük ve orta büyüklükteki işletmelerin desteklenmesi gibi hedefe yönelik istihdam politikaları önceliklendirilmelidir. Üçüncüsü, toplumun her kesimine yönelik istihdam ve işsizlik politikalarının uygulanması gerekliliği devam etmekle birlikte, elde edilen bulgular, ekonomik büyümeye daha yoğun katkı sağlama potansiyeli nedeniyle erkeklere yönelik istihdam ve işsizlik politikalarının stratejik olarak daha hassas ve detaylı bir şekilde ele alınması gerektiğini ortaya koymaktadır. Son olarak, dalgacık analizinin sağladığı zaman-frekans bilgisi, politika etkilerinin kısa veya uzun vadede farklılaşabileceğini göstermektedir. Bu nedenle işsizlik ve büyüme arasındaki ilişkinin dönemsel dinamikleri ve farklı frekanslardaki tepkileri dikkate alınarak, hızlı tepki veren ve duruma özel kısa dönemli politikalar ile daha yapısal ve sürdürülebilir uzun dönemli çözümler sunan politikaların bir arada tasarlanması faydalı olacaktır.