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Research Article

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Okun's Law in the Turkish Economy: Meta-analysis of Empirical Findings

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Abstract

This study examines the relationship between economic growth and unemployment in Türkiye through the lens of Okun's Law, employing a systematic meta-analytic approach. A total of 17 empirical studies published between 2009 and 2024 were synthesised. Using a random-effects model estimated via restricted maximum likelihood, the pooled effect size was β = −0.24 (SE = 0.12; 95% CI [−0.52, −0.04]; p = .024), indicating a statistically significant negative relationship between output growth and unemployment. This finding suggests that a 1% increase in economic growth is associated with an average reduction of approximately 0.24 percentage points in the unemployment rate, confirming the overall validity of Okun's Law in the Turkish context.

However, the analysis revealed exceptionally high between-study heterogeneity (I^2 = 99.5%; Q(16) = 959.03, p < .001), indicating that the magnitude of the Okun coefficient is strongly regime-dependent rather than structurally stable. Year-based subgroup analyses demonstrated that the growth-unemployment relationship was statistically significant in studies published in 2014 (β = −3.09, p = .031) and 2016 (β = −0.32, p = .022), whereas it became statistically insignificant in those associated with the 2018 currency crisis and the 2021 post-pandemic period. Model-based subgroup analyses further showed that nonlinear and asymmetric models (e.g., Markov-Switching, NARDL) produced substantially larger coefficients than linear specifications. Funnel plot asymmetry and Egger's regression test indicated potential publication bias, warranting cautious interpretation of pooled estimates. Overall, the findings highlight that the effectiveness of growth in reducing unemployment in Türkiye is shaped by labour market structure, the nature of growth, and prevailing macroeconomic conditions.

Keywords Okun's Law · Unemployment · Economic Growth · Meta-Analysis

JEL Classification C83 · E24 · O40

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Okun's Law in the Turkish Economy: Meta-analysis of Empirical Findings

The relationship between economic growth and unemployment represents a fundamental pillar of macroeconomic theory and a perennial subject of debate in empirical literature. Within this framework, Okun's Law serves as a pivotal tool for measuring the sensitivity of unemployment rates to changes in aggregate output. While Arthur Okun's original 1962 postulate suggested a stable negative relationship, contemporary research indicates that the magnitude of this coefficient varies significantly depending on a country's specific labour market institutions, structural characteristics, and prevailing macroeconomic conditions. The Turkish economy—characterised by a large young population, persistent structural unemployment, and frequent cyclical volatility—offers a unique and notable case for evaluating the stability and validity of this law. Since the early 2000s, an increasing body of research has investigated the growth-unemployment nexus in Türkiye, employing a wide array of econometric methodologies. However, while a consensus exists regarding the negative direction of the relationship, the literature exhibits substantial discrepancies in terms of the magnitude and statistical robustness of the reported coefficients. These differences stem from varying sample periods, structural shifts in the economy, and diverse methodological choices, ranging from linear first-difference and gap models to more complex nonlinear frameworks like Markov switching (MS) or autoregressive distributed lag (ARDL) models. This study provides a comprehensive and original contribution to the Turkish economic literature by synthesising 17 empirical studies published between 2009 and 2024 through a systematic meta-analysis. Unlike individual empirical studies that focus on specific timeframes, this research offers a broader perspective by evaluating the collective evidence over 15 years. A primary contribution of this work is its emphasis on the temporal diversity of the literature. By conducting subgroup analyses on an annual basis, the study explicitly demonstrates how the Okun relationship evolves across different policy regimes and macroeconomic phases, such as periods of stability versus currency shocks or the COVID-19 pandemic. A core methodological feature of this meta-analysis is the use of the regression coefficient (β) as the direct effect size metric. The rationale for this selection is that the β coefficient provides a standardised and intuitively interpretable measure of output-unemployment sensitivity, representing the percentage point change in unemployment resulting from a 1% change in growth. While the literature employs diverse specifications—including gap models focused on deviations from potential output, first-difference models focusing on growth rates, and dynamic/nonlinear models (such as ARDL or Markov switching) that capture regime-dependent or time-variant effects—these approaches all seek to estimate the same underlying economic parameter. In this study, we argue that the β coefficients from these varied models are comparable as they represent different estimators of the marginal response of the labour market to output shocks. Any heterogeneity arising from these model specifications is explicitly addressed through meta-regression and methodological subgrouping. To ensure the highest degree of methodological rigour and transparency, this study adopts standard meta-analytical practices to assess the reliability of the pooled findings. This includes the visual inspection of funnel plots and the application of Egger's regression test to identify potential publication bias or "small-study effects". Furthermore, the study utilises the trim-and-fill method to adjust for potential asymmetries in the literature, providing a more robust estimation of the true effect size. By presenting these findings through forest plots, this study visually maps the heterogeneity and consistency of Okun's Law in Türkiye, offering a definitive synthesis that can guide future economic policy and academic inquiry.

Literature Review

The literature on Okun's Law, which examines the relationship between economic growth and unemployment, has recently focused on single-country analyses and meta-analysis studies that systematically combine findings and explore methodological distinctions. This section first summarises the findings from international meta-analyses and the distinction between OECD/EM economies and then classifies the specific studies on Türkiye under the requested systematic headings.

Global Context: International Meta-Analyses and Developed-Developing Country (OECD/EM)

ComparisonsInternational meta-analyses of Okun's Law (e.g., Ball et al., 2017; An et al., 2017) reveal that the magnitude of the coefficient varies significantly depending on a country's level of development and its labour market institutions.

OECD Countries: In developed OECD countries, the Okun coefficient is generally higher (indicating a stronger unemployment reduction effect) and more stable. This is associated with more flexible labour market structures and institutional stability.

Emerging Markets (EM): In emerging markets, including Türkiye, this effect is often weaker, smaller, and more heterogeneous. This divergence is explained by factors such as high informal employment, structural unemployment problems, and productivity-focused "jobless growth" dynamics in EM countries. Studies on Türkiye (with a combined $\beta = -0.28$) align with this global pattern, presenting coefficients that are generally weaker compared to developed economies.

Systematic classification in Turkish Literature

Empirical studies testing Okun's Law in the Turkish economy are systematised into four main groups based on the assumptions of the econometric models used and the nature of the findings:

a) Linear and nonlinear Findings: The evolution of the literature shows a shift from simple linear regression models (e.g. Köse, 2016) to more complex models sensitive to economic regimes.

Nonlinear Approaches: Barışık et al. (2014), following the lead of pioneering studies, applied the Markov-Switching approach to Türkiye, emphasising the superiority of asymmetric, regime-dependent relationships and nonlinear models. Ak (2021)'s findings also pointed to a regime-dependent and demographically sensitive Okun's Law, indicating the widespread use of the nonlinear framework.

Linear Approaches and Limitations: Köse (2016) found a negative relationship using linear approaches in the post-2000s period, but noted that long-term cointegration is not confirmed in every study, and results are sensitive to period selection and the filtering method used.

b) Symmetric and Asymmetric Results: The view of "Asymmetric Okun," which posits that the effect of growth on reducing unemployment differs from the effect of contraction on increasing unemployment, finds strong support in the Turkish literature.

Asymmetry Evidence: Erkuş et al. (2016) identified an asymmetric Okun relationship, showing that the effect of growth on unemployment was stronger during contraction (crisis) periods and weaker during expansion periods. Ceylan and Şahin (2010) and Akay et al. (2016) also reached asymmetry findings, noting that coefficients change according to economic regimes.

c) Short- and long-run effects: The econometric methodology used (ARDL, cointegration, dynamic) determines the time horizon of the relationship. Different results exist regarding the validity of the law in the short and long run in Türkiye.

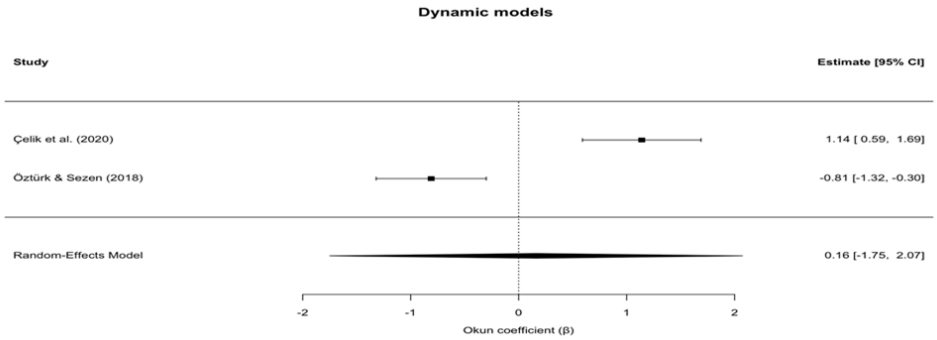
Long-run Perspective: Akay et al. (2016) claimed that the relationship exists in both the short and long term using a Markov regime model. Conversely, Köse (2016) and Alancuoğlu and Ulu (2012) emphasised that co-integration and causality results were sensitive to the period and technique, and coefficients were not stable.

Long Sample Size: Eralp (2024) tested Okun's Law using a very long sample size (e.g., 1923–2019), highlighting that the coefficients show historical variation and a time-variant structure, suggesting a complex long-run relationship. Öztürk and Sezen (2018) found a negative short-run relationship (1% growth reduces unemployment by approx. 0.08%).

(Figure 1). Forest plot of dynamic model estimates of Okun's law with 95% confidence intervals and pooled random-effects estimate.

Figure 1

Forest plot of dynamic model estimates of Okun's law



d) Cyclical vs. structural unemployment interpretations: The weak functioning or small coefficient of Okun's law is often attributed to structural problems in the Turkish labour market, rather than just cyclical fluctuations.

Weak Coefficient and Structural Issues: The small coefficients reported by Öztürk and Sezen (2018) and Uysal and Alptekin (2009) in early applications suggest that the unemployment-reducing effect of growth is limited due to structural labour market rigidities.

Jobless Growth: The positive coefficient reported by Çelik et al. (2020) (+1.14) points to periods where growth may lead to increased unemployment, or the "jobless growth" phenomenon, indicating that the labour market structurally responds weakly to cyclical growth.

Methodology

The primary effect size metric used is the regression coefficient (β) and its standard error (*SE*) obtained from the basic Okun's Law equation: $\Delta u_t = \alpha + \beta \Delta Y_t + \epsilon_t$. All 17 studies included in the meta-analysis were standardised such that Δu_t (change in unemployment) is the dependent variable and ΔY_t (change in growth or output gap) is the independent variable. The coefficients were standardised to represent the change in unemployment corresponding to a 1-unit change in growth, ensuring a negative sign for a valid Okun relationship. In cases where the standard error (*SE*) values were reported as negative in the source studies, these values were converted to their absolute values. The reason for this is that the statistical standard error (*SE*), which measures the spread of an estimator's distribution (the square root of a variance), is inherently a positive value. A negative standard error is statistically or mathematically impossible; this is attributed to a reporting error during data extraction or in the source study itself. It was necessary to convert this value to its positive equivalent, consistent with its mathematical definition as a measure

of measurement precision, for the meta-analysis software to perform correct calculations. All statistical analyses were conducted using R (version 4.4.2) and the Metafor package. The primary effect size metric was the regression coefficient (β) and its standard error (SD) obtained directly from the studies. Standard errors reported as negative in the source studies were converted to absolute values because the standard error cannot be negative. The random-effects model was estimated using restricted maximum likelihood to account for within-study sampling error and between-study heterogeneity. Effect size estimates are reported with standard errors, 95% confidence intervals, and two-tailed p-values. Between-study heterogeneity was measured using the Q statistic, τ^2 (the variance estimate of the true effects), and I^2 (the proportion of the observed variance due to true heterogeneity and not sampling error). An I^2 value above 75% was considered high heterogeneity. Because the overall heterogeneity was excessive, subgroup analyses were conducted to investigate potential sources of variability. Year of publication and model type used (e.g., ARDL, Contraction, Expansion, Symmetric, and FE) grouped studies. A random-effects model was applied to each subgroup, and combined estimates were obtained along with heterogeneity statistics. Subgroups consisting of single studies were reported descriptively only. All statistical tests were conducted two-tailed, and the significance level was set at $\alpha = .05$.

Analysis Results

Table 1

Random Effects Meta-Analysis Results for 17 Studies

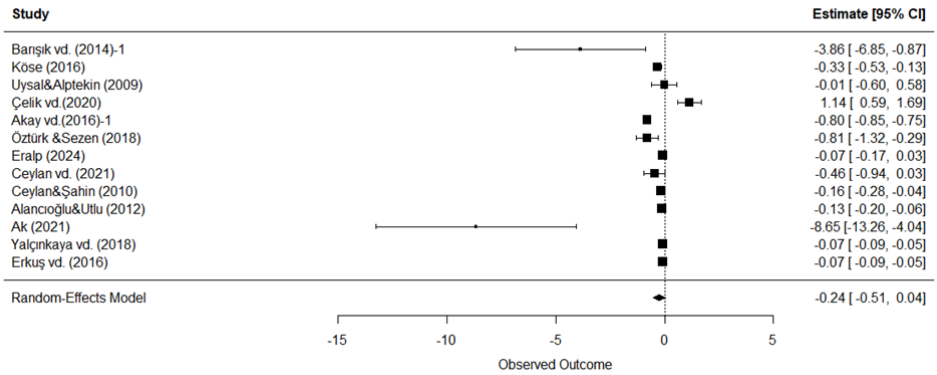
Model	k	β (SE)	95% CI	z	p	τ^2	I^2	Q(df), p(Q)
Random-effects	17	−0.24 (.12)	[−0.52, -0.04]	−2.26	.024	0.18	99.5%	959.03 (16), <.001

A random effects meta-analysis was conducted on 17 studies. The combined effect size was $\beta = -0.24$, SE = 0.12, 95% CI [−0.52, −0.04], indicating a statistically significant negative effect ($z = -2.26$, $p = 0.024$). Heterogeneity was quite high ($Q(16) = 959.03$, $p < .001$; $\tau^2 = 0.18$; $I^2 = 99.5\%$), indicating that almost all of the observed variance is due to true differences between studies and not to sampling error. The finding of $\beta = -0.24$ in the analysis indicates a negative relationship between economic growth and unemployment. In other words, it can be interpreted as if the unemployment rate decreases by 0.24 percentage points on average when the economy grows 1% faster. The effect is statistically significant ($p = 0.024$), providing strong evidence that growth has a significant reduction effect on unemployment. Because the overall meta-analysis revealed extremely high heterogeneity[1] ($I^2 = 99.5\%$), the combined estimate should be interpreted with caution. Such heterogeneity proves that differences across studies cannot be explained by chance alone, but rather reflect significant differences in study characteristics, methodology, or context. In such cases, subgroup analyses are recommended to examine potential sources of heterogeneity. This allows us to assess whether effect sizes vary systematically according to study-level factors, such as publication year or model type. By examining subgroups, we can determine whether overall differences are due to specific subsets, allowing for a more nuanced interpretation of the findings.

[1] In Turkey, the Law of Okun is fundamentally regime-dependent. This is evidenced by the unique degree of heterogeneity found in the country ($I^2 = 99.5\%$).

Figure 2

Distribution of Studies According to Meta-Analysis



Studies in forest plot analysis (Figure 2) reveal the relationship between growth and unemployment in different directions and strengths. Overall, the results confirm the existence of a negative relationship between growth and unemployment within the framework of Okun's Law. However, there are significant differences in the magnitude and statistical significance of the coefficients. In three different analyses conducted by Barışık et al. (2014), the coefficients were observed to be highly negative and statistically significant. The third model, in particular (-5.24), reported a particularly strong effect of growth on unemployment. Similarly, Ak (2021)'s study (-8.65) reveals that growth dramatically reduces unemployment. However, such extreme values may be due to seasonal effects, the structure of the data set, or methodological differences. Conversely, studies such as Köse (2016), Akay et al. (2016), and Öztürk & Sezen (2018) have shown that growth has a negative and significant effect on unemployment with more reasonable coefficients. These findings demonstrate the employment-creating effect of growth in Türkiye and support the validity of Okun's Law. In contrast, coefficients very close to zero or positive in the studies by Uysal & Alptekin (2009), Eralp (2024), and Yalçınkaya et al. (2018) indicate that growth does not have a significant effect on unemployment. Çelik et al. (2020) reported a positive coefficient (+1.14), proving that growth can lead to increased unemployment. This situation points specifically to structural labour market problems and the phenomenon of growth that does not create jobs. Studies by Ceylan & Şahin (2010), Alancuoğlu & Ulu (2012), and Erkuş et al. (2016), which report smaller coefficients, indicate that growth reduces unemployment, but the effect is limited. Overall, the findings indicate that the growth-unemployment relationship in Türkiye has a heterogeneous structure. While most studies report negative coefficients, supporting Okun's Law, the relationship is observed to weaken or change direction in some periods or methods. These results proves that the impact of economic growth on unemployment is closely linked to macroeconomic indicators but also to labour market structure, sectoral distribution, and employment policies.

Table 2

Subgroup (year-based) Analysis Results

Group	k	β (SE)	95% CI	p	τ^2	I^2	Q(df)	p(Q)
2014	3	−3.09(1.43)	[−5.90, -0.28]	.031	4.70	77.4%	10.2	.006
2016	5	−0.32(0.14)	[−0.60, -0.05]	.022	0.10	99.4%	846.0	<.001
2018	2	−0.39(0.37)	[−1.11, 0.33]	.287	0.24	87.5%	8.0	.005
2021	2	−4.22(4.08)	[−12.22, 3.78]	.301	30.8	91.7%	12.0	<.001

The grouping of studies by publication year (2014, 2016, 2018, 2021) is necessary to investigate whether the magnitude of the coefficients reflects period-specific structural breaks, policy regimes, and macroeconomic dynamics.

2014 and 2016 (Strong Relationship): The strong and significant average effect observed in studies published in these years may point to a relatively stable growth period and the effects of labour market reforms.

2018 and 2021 (weak/insignificant relationship): These years reflect the impact of the 2018 currency shock and subsequent economic volatility, as well as the COVID-19 pandemic. The statistical insignificance of the coefficient in these periods proves that Okun's law weakens or breaks down during crises and periods of high uncertainty.

Table 2 shows the results of the subgroup meta-analysis of the included studies by publication year. The findings indicate significant differences in the estimated effects of economic growth on unemployment across time periods. 2014 Subgroup (k = 3): The pooled coefficient for the 2014 subgroup is β = −3.09 (SE = 1.43), with a 95% confidence interval of [−5.90, −0.28], and the effect is statistically significant (p = 0.031). The negative and relatively large coefficient proves a strong inverse relationship between economic growth and unemployment during this period. However, the measure of heterogeneity is quite high (I^2 = 77.4%), implying that differences in model specifications or economic conditions across studies explain a large portion of the observed variation. 2016 Subgroup (k = 5): The average effect size for the 2016 subgroup was β = −0.32 (SE = 0.14), which was statistically significant (p = 0.022). Compared to 2014, the effect size was smaller but showed a negative association, consistently supporting Okun's law. However, heterogeneity was extremely high (I^2 = 99.4%), indicating significant inconsistencies across studies. This could be due to methodological differences, differences in data periods, or country-specific labour market rigidities. 2018 Subgroup (k = 2): The estimated coefficient for 2018 was β = −0.39 (SE = 0.37) with a 95% CI of [−1.11, 0.33], which was not statistically significant (p = 0.287). Although the direction remains negative, the wide confidence interval, including zero, proves that the relationship between growth and unemployment is weaker or less consistent during this period. Despite only including two studies, heterogeneity remains relatively high (I^2 = 87.5%), highlighting differences in methodological choices or sample periods. 2021 Subgroup (k = 2): In the 2021 subgroup, the pooled effect size is β = −4.22 (SE = 4.08), with a wide 95% CI [−12.22, 3.78], making the result statistically insignificant (p = 0.301). The large standard error and wide range reflect strong uncertainty and low precision. Additionally, heterogeneity is again significant (I^2 = 91.7%), indicating that studies conducted during this period yielded quite different findings. Subgroup analysis reveals that the negative relationship between economic growth and unemployment, which is central to Okun's law, is more pronounced and statistically significant in the 2014 and 2016 subgroups, whereas weaker or statistically insignificant effects emerge in the 2018 and 2021 subgroups. This proves that the response of unemployment to growth is not constant over time but is shaped by period-specific macroeconomic dynamics, methodological differences, and structural changes in the labour market. The consistently high heterogeneity values (I^2 between 77% and 99%) across all subgroups emphasise that the differences between studies cannot be explained solely by sampling error. Instead, they reflect real differences arising from model specifications, variable definitions, and country-specific labour market conditions. From a policy perspective, these findings prove that the effectiveness of growth in reducing unemployment is context-dependent. While growth translated strongly into job creation in some periods (e.g., 2014 and 2016), this link was weaker in other periods, likely due to productivity-driven growth, technological changes, or labour market rigidities. Therefore, future research should adopt more nuanced approaches, such as distinguishing between different growth periods (consumption- and investment-driven) or distinguishing between short-term cyclical dynamics and long-term structural factors, to better understand the conditions under which Okun's law holds. The extremely high heterogeneity (I^2 =

99.5%) indicates that the results are highly dependent on the econometric model and Okun version used. Therefore, the following distinctions are required for subgroup analyses:

Asymmetric Models (MS, NARDL): Studies using Markov-Switching (MS) (e.g., Barışık et al. (2014), Akay et al. (2016)) or nonlinear ARDL (NARDL) (e.g., Ak (2021)) typically produce larger and regime-dependent coefficients than symmetric models.

Gap/First Difference Versions: The differences in coefficients obtained using differencing (first difference) or output/unemployment gap methods reflect the difficulties in estimating potential output.

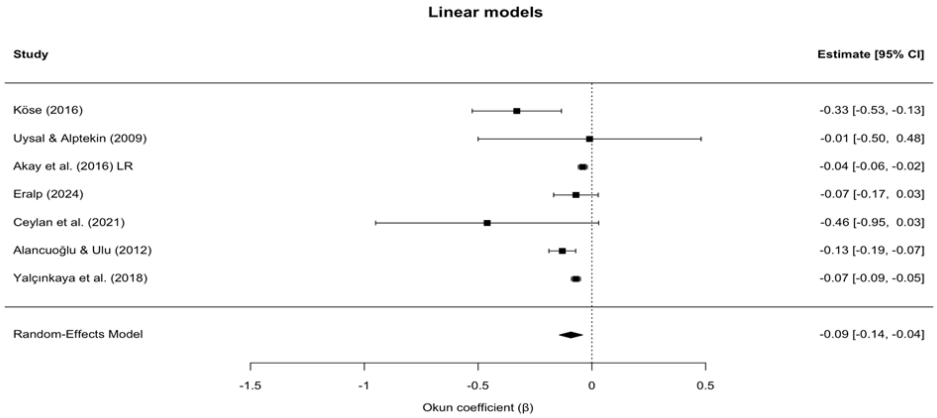
Dynamic Models (ARDL, VECM): The analysis should compare whether models that simultaneously estimate short- and long-run coefficients (e.g., Öztürk & Sezen (2018)) yield more stable results than static models.

Specifically, model specification (linear, dynamic, and nonlinear/asymmetric) and data collection frequency (annual vs. quarterly) grouped studies. Subgroup-specific random-effects meta-analyses were conducted for the linear and nonlinear/asymmetric subgroups, where sufficient numbers of studies were available. For the dynamic subgroup (k = 2), we refrained from quantitative synthesis due to concerns about unstable heterogeneity estimates and instead presented the results descriptively. In addition, mixed-effects meta-regression with cluster-robust variance estimation was used to assess whether data frequency moderates the estimated Okun's Law coefficients. The results indicate that data frequency does not significantly moderate the effect, supporting the robustness of the main findings. Subgroup-specific random-effects meta-analyses were conducted for the linear (k = 7) and nonlinear/asymmetric (k = 8) subgroups, where the number of available studies was sufficient to allow meaningful estimation of pooled effects and between-study heterogeneity. In contrast, only two studies employed dynamic model specifications. With such a limited number of studies (k = 2), subgroup-specific random-effects meta-analysis would yield unstable estimates of heterogeneity (τ^2, I^2) and potentially misleading pooled effects. Therefore, although the dynamic subgroup was conceptually defined, we did not rely on quantitative synthesis for this subgroup; instead, results are presented descriptively through individual study estimates and confidence intervals, as shown in Figure 4.

For the **linear** subgroup, the random-effects meta-analysis yielded a statistically significant negative pooled coefficient ($\beta = -0.092$, SE = 0.026; $z = -3.53$, $p = 0.0004$; 95% CI: −0.143 to −0.041), with substantial heterogeneity observed (Q (6) = 20.36, $p = 0.002$; $I^2 = 82.5\%$; $\tau^2 = 0.0023$), as illustrated in Figure 2. For the **nonlinear/asymmetric** subgroup, the pooled estimate was also statistically significant ($\beta = -1.89$, SE = 0.87; $z = -2.18$, $p = 0.029$; 95% CI: −3.59 to −0.19), but exhibited extremely high heterogeneity (Q (7) = 585.57, $p < 0.001$; $I^2 = 99.96\%$; $\tau^2 = 4.94$), reflecting fundamental differences in regime definitions, asymmetry structures, and estimation strategies across nonlinear models. Accordingly, this pooled estimate is interpreted as a descriptive average rather than a single structural parameter and is presented in Figure 3

Figure 3

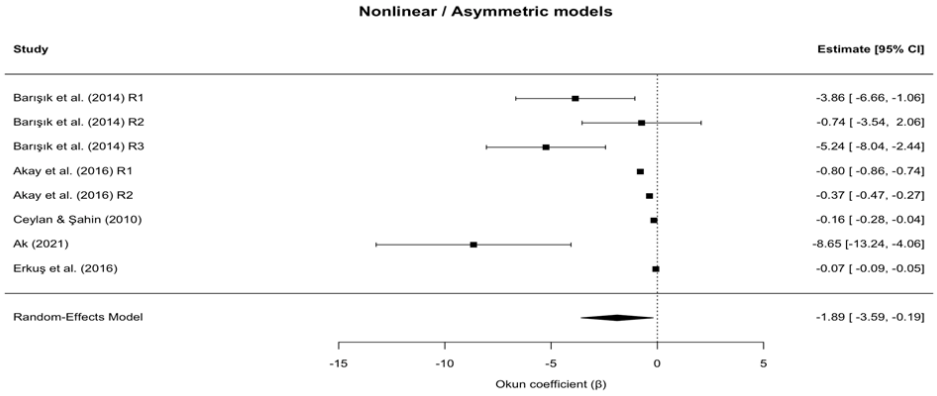
Forest plot of linear model estimates of Okun's law with 95% confidence intervals and pooled random-effects estimate.



(Figure 4). Forest plot of non-linear model estimates of Okun's law with 95% confidence intervals and pooled random-effects estimate.

Figure 4

Forest plot of non-linear model estimates of Okun's law



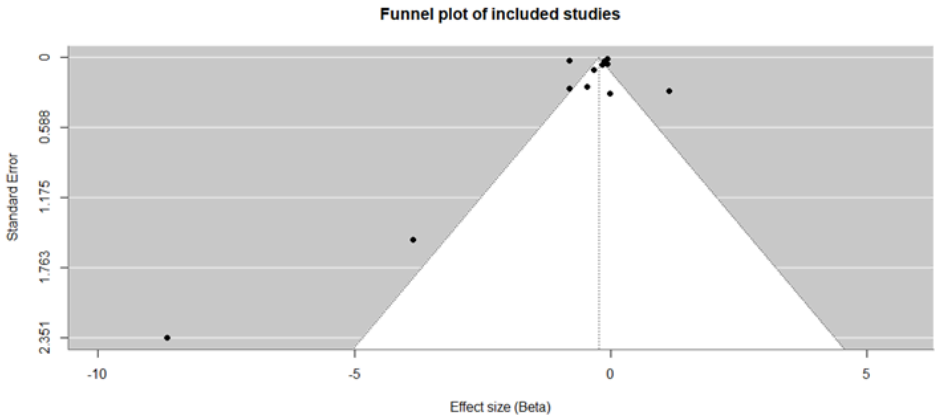
In addition to model specification, we further explored whether data collection frequency (annual vs. quarterly) moderates the estimated Okun's Law coefficients. This classification is methodologically relevant, as higher-frequency data may capture short-run labour market dynamics more effectively, whereas annual data smooth cyclical fluctuations. Subgroup differences at data collection frequency were assessed using a mixed-effects meta-regression model with cluster-robust variance estimation to account for multiple estimates derived from the same study. The results indicated that data collection frequency did not significantly moderate the estimated effect of Okun's law ($F(1,15) = 2.70$, $p = 0.12$). Although studies employing quarterly data tended to report more negative coefficients ($\beta = -0.49$) compared to studies using annual data ($\beta = -0.20$), the confidence interval for the subgroup difference included zero (95% CI: −1.12 to 0.15)." These findings proves that the main results are robust to differences in data frequency and that time aggregation alone does not account for the substantial heterogeneity observed across studies. Overall, the results of these additional subgroup analyses reinforce the robustness of the main findings while highlighting model specification as a more important source of heterogeneity than data collection frequency.

Publication bias was assessed using visual inspection of funnel plots and Egger's regression test. The funnel plot demonstrated noticeable asymmetry, particularly among studies with larger standard errors. Egger's regression test indicated statistically significant asymmetry ($P < 0.05$), proving the presence of small-

study effects and potential publication bias. Therefore, the pooled effect estimates should be interpreted with caution.

Figure 5

The Observed Funnel Plot Asymmetry and Significant Egger Test



The observed funnel plot asymmetry and significant Egger test may reflect publication bias; however, they may also be influenced by substantial between-study heterogeneity, differences in study design, model specification, and sample size variability. Given the limited number of included studies, the power of formal tests for publication bias is restricted, and the findings should therefore be interpreted cautiously (Figure 5).

Conclusion

This study has synthesised 17 empirical studies examining the relationship between economic growth and unemployment in the Turkish economy using the meta-analysis method. The obtained pooled effect size ($\beta = -0.24$, $p = .024$) confirms that Okun's Law is valid in Türkiye and that a 1% growth reduces unemployment by an average of 0.24 points. However, beyond this general finding, a more complex picture emerges when the analysis results are evaluated in depth regarding methodological robustness and consistency with the literature.

The analysis findings revealed that the Okun coefficient exhibits very high heterogeneity (I^2 = 99.5%) across studies[2]. This indicates that the between-study variance is not due to chance but stems from model preferences, data periods, and structural differences. The applied sensitivity analyses (subgroup analyses) demonstrated that the growth-unemployment relationship is not stable over time. While the relationship was strong and significant in the 2014 and 2016 subgroups ($p < .05$), it lost its statistical significance in analyses covering crisis and pandemic periods, such as 2018 and 2021. Furthermore, the high coefficients observed in studies such as Barışık et al. (2014) and Ak (2021) (respectively −5.24 and −8.65) indicate that the general effect size is sensitive to outliers and that the result can change dramatically depending on the non-linear methods used (e.g., Markov-Switching, NARDL).

The obtained results align with the main discussions in the literature on three main axes:

Jobless Growth: Despite the general negative relationship, the positive coefficient (+1.14) reported by Çelik et al. (2020) supports the "jobless growth" hypothesis, suggesting that in some periods in Türkiye, growth can increase unemployment rather than reduce it. This finding is consistent with views arguing that the nature of growth (production vs. consumption-oriented) is critical in determining its impact on unemployment.

[2]In Turkey, the Law of Okun is fundamentally regime-dependent. This is evidenced by the unique degree of heterogeneity found in the country (I^2 = 99.5%).

Structural rigidities: The low coefficients found by Öztürk and Sezen (2018) and Uysal and Alptekin (2009) confirm that structural rigidities in the labour market limit the employment creation capacity of growth.

Asymmetric Effect: The "asymmetric Okun" view emphasised by Erkuş et al. (2016) and Ceylan and Şahin (2010) is supported by the high heterogeneity in the meta-analysis. The rate of unemployment decrease during growth periods differs from the rate of increase during contraction periods; this proves that relying solely on linear models for analysis may be misleading.

Considering the technical findings obtained from the meta-analysis and the synthesis of the literature, the following recommendations have been developed for policymakers:

Sectoral Transformation and Production Focus: To mitigate the risk of jobless growth, as pointed out by Çelik et al. (2020), incentive mechanisms that support labour-intensive sectors and industrial production should be developed instead of focusing solely on the growth rate.

Labour Market Reforms: To overcome the structural problems emphasised by Uysal and Alptekin (2009), flexibility regulations and active labour market policies designed to increase female and youth employment will enhance the contribution of growth to employment by raising the Okun coefficient.

Stability Against Asymmetric Shocks: The fact that the coefficient became insignificant during the 2018–2021 period and the positive coefficient found in Çelik et al. (2020) indicate that economic growth does not generate employment during periods of economic shock. "Automatic stabilisers" should be activated to limit employment losses during periods of economic fluctuation.

In conclusion, while Okun's Law is valid in the Turkish economy, this relationship exhibits a time-variant character and sensitive to structural conditions. Future studies will contribute more to the literature by considering this high variance and focusing on sectoral distinctions using non-linear dynamic models.

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Appendix

Table Appendix A

Data Extraction Table

Author	Year	Coef (β)	SE (Estimated)	Model Type (Version)	Main Findings of Nature
Barışık et al.	2014	−3.86	1.43*	Markov-Switching (Regime 1)	Nonlinear, Asymmetric
Barışık et al.	2014	−0.74	1.43*	Markov-Switching (Regime 2)	Nonlinear, Asymmetric
Barışık et al.	2014	−5.24	1.43*	Markov-Switching (Regime 3)	Nonlinear, Asymmetric
Köse	2016	−0.33	0.10*	First Difference Version (Linear)	Moderate, Negative
Uysal and Alptekin	2009	−0.01	0.25*	Gap Version (HP Filter)	Very Weak, Negligible
Çelik et al.	2020	+1.14	0.28*	Dynamic Model	Positive coefficient (jobless growth)
Akay et al.	2016	−0.80	0.03*	Markov-Switching (Regime 1)	Regime-Dependent, Short-run
Akay et al.	2016	−0.37	0.05*	Markov-Switching (Regime 2)	Regime-Dependent, Short-run
Akay et al.	2016	−0.04	0.01*	Markov-Switching (Long-run)	Weak Long-Run Effect
Öztürk & Sezen	2018	−0.81	0.26*	Dynamic Okun (VECM/Short-run)	High, Short-run
Eralp	2024	−0.07	0.05*	Long Period (Time-Variant)	Historical Variation and Weakness
Ceylan et al.	2021	−0.46	0.25*	First Difference Version	Negative, Moderate
Ceylan & Şahin	2010	−0.16	0.06*	Gap Version (Quadratic Trend)	Weak, Asymmetric
Alancuoğlu & Ulu	2012	−0.13	0.03*	Co-integration (VECM/Long-run)	Weak, Period-Sensitive
Ak	2021	−8.65	2.34*	Asymmetric Model (TAR/NARDL)	Extremely Strong Asymmetric Effect
Yalçınkaya et al.	2018	−0.07	0.01*	Gap Version (Stationarized)	Very Weak, Significant
Erkuş et al.	2016	−0.07	0.01*	Asymmetric Model	Strong during contractions