

## Research Article / Araştırma Makalesi

# The Effect of Confidence in the Economy on Tax Revenues in Türkiye

*Türkiye’de Ekonomiye Duyulan Güvenin Vergi Gelirleri Üzerindeki Etkisi*

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### ABSTRACT

Economic confidence, reflecting individuals' and firms' economic expectations and perceptions of market conditions, plays a crucial role in economic activity by influencing decisions to consume, invest and save. The expansion or contraction of these activities indirectly affects the level of tax revenues. Objectives of the research to analyze the effect of economic confidence in terms of tax revenue in Türkiye during the period 2007:Q1-2024:Q1. The results of the Johansen cointegration analysis show that there is a long-run relationship between the economic confidence index, GDP, and tax revenues and that there are at least two cointegration vectors. The VECM estimates, changes in GDP smooth the error terms and stabilize the dynamics of the model, while changes in the business confidence index effectively explain the imbalances in the model. In particular, the negative coefficient on the error terms for the previous period (-0.757) indicates a substantial effect on the correction of past errors in the current period. Furthermore, the results of the Granger causality analysis show that changes in the economic confidence index have a unidirectional causal effect on the short-term tax revenue.

### MAKALE BİLGİSİ

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#### Anahtar Kelimeler

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#### Jel Kodları

B23, H27, H30

### ÖZ

Bireylerin ve işletmelerin ekonomik beklentileri ile piyasa koşullarına dair algılarını yansıtan ekonomik güven, tüketim, yatırım ve tasarruf kararlarını ekonomik faaliyetler üzerinde belirleyici bir rol oynamaktadır. Bu faaliyetlerin genişlemesi ya da daralması, dolaylı olarak vergi gelirlerinin seviyesini şekillendirmektedir. Bu çalışma kapsamında da Türkiye’de 2007:Q1-2024:Q1 döneminde ekonomiye duyulan güvenin vergi gelirleri üzerine olan etkisini incelemek amaçlanmaktadır. Johansen eşbütünleşme analizi ile elde edilen sonuçlar, ekonomik güven endeksi, GSYH ve vergi gelirleri arasında uzun dönemli bir ilişki olduğunu ve en az iki eşbütünleşme vektörünün mevcut olduğunu göstermektedir. VECM tahminlerine göre, GSYH’deki görülen değişimlerin hata terimlerini yumuşatarak modelin dinamiklerini dengelediği, ekonomik güven endeksindeki değişimlerin ise modeldeki dengesizlikleri açıklamada etkili olduğu ortaya konmuştur. Özellikle hata terimlerinin önceki dönem negatif katsayısı (-0,757), geçmiş dönem hatalarının cari dönemde düzeltilmesi üzerinde önemli bir etkiye işaret etmektedir. Ayrıca Granger nedensellik analizi ile elde edilen sonuçlar, ekonomik güven endeksindeki değişimlerin kısa vadede vergi gelirleri üzerinde tek yönlü bir nedensellik ilişkisi oluşturduğunu göstermektedir.

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## GENİŞLETİLMİŞ ÖZET

### Giriş ve Araştırmanın Amacı

Bu çalışma, ekonomiye duyulan güvenin Türkiye'deki vergi gelirleri üzerindeki etkilerini incelemeyi amaçlamaktadır. Ekonomik güven, bireylerin ve işletmelerin geleceğe yönelik beklentilerini belirleyerek onların tüketim, tasarruf ve yatırım kararlarını şekillendirmektedir. Güven düzeyi yüksek olduğunda, tüketiciler harcamalarını artırma, işletmeler ise yeni yatırımlar yapma eğilimindedir; bu da vergi tabanını genişletir ve dolayısıyla vergi gelirlerini artırır. Diğer yandan, ekonomiye olan güvenin düşük olduğu dönemlerde ekonomik aktörler harcamalarını kısıtlama ve yatırımlarını erteleme eğilimindedir. Bu durum ekonomik faaliyeti yavaşlatarak vergi gelirlerinde düşüşe yol açabilir. Ekonomiye duyulan güvenin azalması, aynı zamanda yasa dışı ekonomik faaliyetlerin artmasına neden olabilmektedir. Kayıt dışı ekonominin büyümesi ise, vergi tahsilatını zorlaştırarak devletin kamu harcamalarını finanse etme kapasitesini sınırlamaktadır.

Vergi gelirlerinin sürdürülebilirliği ve ekonomik istikrarın sağlanması, özellikle Türkiye gibi gelişmekte olan ekonomiler için büyük önem taşımaktadır. Türkiye'de vergi gelirlerinin dalgalanması, kamu maliyesinde belirsizliklere ve ekonomik büyümenin istikrarını sağlayacak kaynakların yetersiz kalmasına yol açabilmektedir. Bu bağlamda, ekonomiye olan güven düzeyinin vergi gelirlerine etkisini anlamak hem vergi tahsilatını iyileştirmek hem de ekonomik politikaların etkinliğini artırmak için gereklidir. Çalışmanın temel amacı, Türkiye'de 2007Q1-2024Q1 dönemleri arasında ekonomiye duyulan güvenin vergi gelirlerine etkisini incelemektir. Analiz, ekonomik güven ile vergi gelirleri arasındaki ilişkiyi daha iyi anlamak ve güven düzeyinin artırılması durumunda vergi gelirlerinin sürdürülebilirliğini sağlamak için politika yapıcılara yol gösterici öneriler sunmayı hedeflemektedir.

### Metodoloji

2007:Q1-2024 dönemleri arasında Türkiye'deki ekonomiye duyulan güvenin vergi gelirleri üzerindeki etkisini incelemek amacıyla oluşturulan bu çalışmanın modelinde, ekonomik büyüme ve güven endeksi bağımsız değişkenlerinin vergi gelirlerine etkisi analiz edilmiştir. Ekonometrik analizlerde kullanılan zaman serilerinin durağan olup olmadığının tespiti, analizlerin güvenilirliği açısından önem taşımaktadır. Bu kapsamda, ADF ve PP birim kök testleri ile serilerin durağanlık sınaması gerçekleştirilmiştir. Serilerin aynı mertebeden durağan oldukları belirlendikten sonra, uzun dönemli ilişkiler Engle-Granger ve Johansen eşbütünleşme testleri ile analiz edilmiştir. Çalışmada, Johansen eşbütünleşme analizi yapılmadan önce en uygun model belirlenmiş, ardından Granger nedensellik testi ile değişkenler arasındaki kısa dönem dinamikleri ve nedensellikler araştırılmıştır. Durağan olmayan seriler için VECM kullanılarak uzun dönem dengeden sapmalar ele alınmıştır. Bu yöntem, değişkenler arasında uzun dönem denge ilişkisini koruyarak kısa dönem dengesizliklerinin düzeltilmesine olanak sağlamaktadır.

### Bulgular

Bu çalışmada sonucunda ulaşılan bulgular, Türkiye'de, vergi gelirlerinin ekonomik büyüme ve ekonomik güven endeksi üzerinde uzun vadeli bir etkisi olduğu ortaya çıkmaktadır. Birim kök testi sonuçlarına göre, serilerin fark alındığında durağan hale geldikleri belirlenmiş ve analiz için uygun hale getirilmiştir. Johansen eşbütünleşme testiyle elde edilen bulgulara göre, vergi gelirleri, ekonomik büyüme ve ekonomik güven endeksi arasında en az iki eşbütünleşme vektörü bulunmuştur. Başka bir ifadeyle değişkenler arasında uzun dönemli bir denge bulunmaktadır. VECM sonuçları, ekonomik büyümedeki bir önceki dönem değişikliklerinin hata terimlerini düzelterek modelin dinamiklerine önemli katkıda bulunduğunu, ekonomik güven endeksindeki değişikliklerin ise modeldeki dengesizlikleri belirlemede etkili olduğunu göstermiştir. Özellikle hata terimlerinin negatif katsayısı (-0.757), geçmiş dönem hatalarının mevcut dönemdeki hataları düzeltecek yönde etkili olduğunu belirtmektedir. Granger nedensellik testi sonuçlarına göre, ekonomik güven endeksindeki değişimlerin vergi gelirleri üzerinde kısa dönemde tek taraflı nedensellik oluşturduğu görülmektedir. Ekonomik güven endeksindeki artışların, tüketim ve yatırım harcamalarını teşvik ederek vergi tabanını genişlettiği ve vergi gelirlerini kısa vadede artırdığı anlaşılmaktadır.

### Sonuç ve Tartışma

Bu çalışmanın bulguları, Türkiye'de ekonomiye duyulan güvenin vergi gelirleri ve dolayısıyla ekonomik istikrar üzerindeki önemli etkilerini gözler önüne sermektedir. Analiz sonuçları, ekonomik güvenin zedelenmesi durumunda kayıt dışı ekonominin büyüdüğünü ve bunun da vergi tahsilatını doğrudan olumsuz etkilediğini ortaya koymaktadır. Vergi tabanının daralması, devletin kamu harcamalarını finanse etme kapasitesini sınırlamakta; bu da devletin ya borçlanmaya başvurmasına ya da kamu yatırımlarını kısıtlamasına yol açabilmektedir. Ayrıca, kayıt dışı ekonominin, düşük katma değerli üretim faaliyetleri ve vasıfsız iş gücü istihdamına odaklanması, ekonomik büyümeyi ve rekabet gücünü sınırlandıran önemli bir yapısal sorun olarak öne çıkmaktadır. Bu bağlamda çalışmada, vergi gelirlerini artırmak ve ekonomik güveni yükseltmek amacıyla kapsamlı politika önerileri sunulmuştur. Öncelikle, şeffaflık, hesap verebilirlik ve yolsuzlukla mücadele politikalarının etkinleştirilmesi; vergi yönetimi ve denetimlerinin güçlendirilmesi gerekmektedir. Dijitalleşme ve veri analitiği gibi teknolojik çözümlerle vergi uyumunun artırılması, vergi kaçakçılığının önlenmesinde önemli katkılar sağlayacaktır. Ek olarak, yatırım ortamının iyileştirilmesi, öngörülebilir iş düzenlemelerinin sağlanması ve vasıflı iş gücünün artırılması, ekonominin verimlilik düzeyini artıracak ve kayıtlı ekonomiye geçişi teşvik edecektir. Sonuç olarak, ekonomiye duyulan güvenin artırılması, vergi gelirlerinin sürdürülebilirliği ve ekonomik istikrarın sağlanması açısından kritik bir gereklilik olarak değerlendirilmektedir. Bu politikaların uygulanması, Türkiye'nin vergi gelirlerini artırarak kamu maliyesini güçlendirmesine ve uzun vadede sürdürülebilir kalkınmayı sağlamasına katkı sunabilir. Bununla birlikte, önerilen tedbirlerin değişen küresel ekonomik koşullar ve ülkenin iç dinamikleri göz önüne alınarak düzenli olarak değerlendirilmesi gerekmektedir. Böylece, ekonomiye duyulan güvenin pekiştirilmesi ve ekonominin uzun vadeli rekabet gücünün artırılması sağlanabilir.

## Introduction

Economic confidence reflects the perceptions and expectations of economic actors, such as consumers, investors, and businesses, regarding current and future economic conditions. This level of confidence plays a critical role in shaping economic decisions and behaviors, thereby having significant effects on tax revenues. High levels of trust in the monetary stability contribute to the revitalization of economic activities, leading to increased government tax revenues, whereas low levels of confidence can heighten economic uncertainty and negatively impact tax revenues (Fan et al., 2023). Economic confidence is assessed through several fundamental components. Key factors influencing confidence levels include macroeconomic stability, inflation rates, interest rates, and the consistency of growth rates (Gremi, 2013). Furthermore, political stability and the predictability of government policies are crucial factors that enhance economic confidence (Farooq et al., 2023). The reliability of financial markets and the banking system also serves as a determinant of economic confidence (Asafo-Adjei et al., 2021). For developing economies like Türkiye, maintaining the stability of these factors is essential for ensuring and sustaining economic confidence.

Tax revenues are a primary determinant of the state's fiscal power and its capacity to finance public services (Gurdal et al., 2021). The level of tax revenues is affected by multiple factors, including economic growth, tax policies, and tax compliance. Economic growth increases incomes and revenues, broadening the tax base, thereby boosting tax revenues (Maganya, 2020). Higher economic growth rates elevate the incomes of both businesses and individuals, leading to increased tax collections. Additionally, tax policies—encompassing tax rates, tax bases, exemptions, and exceptions—play a crucial role in determining tax revenues (Schwab et al., 2022). An effective and equitable tax system ensures that tax revenues are both stable and sustainable. Furthermore, factors such as tax compliance, taxpayers' willingness to pay taxes, and the rates of tax evasion significantly influence the collection of tax revenues (Kassa, 2021). Implementing measures to enhance tax compliance can contribute to increasing tax revenues.

The effect of confidence in the economy on tax revenues can be analyzed through the lens of various economic theories. According to Keynesian theory, increased confidence in the economy boosts consumption and investment expenditures, thereby expanding economic activities and the tax base (Cogan et al., 2010). When consumers and investors hold positive expectations about the future, they are more likely to spend and invest. This heightened economic activity results in increased incomes and profits, leading to a broader tax base and higher tax revenues. Consumer confidence indices and business confidence indices are crucial indicators for measuring this relationship. Rational expectations theory posits that economic agents make rational decisions based on their knowledge and expectations about future economic policies and macroeconomic conditions (Visco and Zevi, 2020). From this perspective, a decline in confidence in the economy can increase economic uncertainties, diminish the willingness to pay taxes and elevate tendencies toward tax evasion. Consequently, this scenario results in decreased tax revenues. Tax morale theory examines the moral and ethical attitudes of individuals and firms towards tax payment (Salé et al., 2021). It assumes that when confidence in the economy is high, tax morale will also be high, leading to an increased willingness to pay taxes. Conversely, when confidence levels are low, a decline in tax morale may occur, resulting in tax evasion and a reluctance to pay taxes (Owusu et al., 2022). This decline in tax morale ultimately leads to reduced tax revenues.

In emerging economies such as Türkiye, maintaining economic stability and increasing confidence are important for the sustainable growth of tax revenues. In this framework, this study analyses the impact of economic confidence on Türkiye's tax revenues between 2007:Q1 and 2024:Q1.

The study begins with an introduction that highlights the critical role of economic confidence in shaping tax revenues and outlines the research objectives. The second section presents a comprehensive literature review, summarizing previous studies and emphasizing the distinctions between this research and existing literature. The third section focuses on the study's methodology and analytical techniques, detailing the application of the Johansen cointegration approach to examine long-term relationships between variables and the use of Granger causality analysis to identify causality among them. The findings are thoroughly discussed within this section. The study concludes with a final section that provides recommendations for enhancing Türkiye's tax revenues and strengthening economic stability, based on the insights gained from the analysis. The overall structure follows a logical progression, starting with the theoretical framework and advancing through the methodology to the detailed presentation of findings and practical recommendations.

## 1. Literature Review

In the literature, economic confidence is a major factor of economic growth (Matsusaka and Sbordon, 1995; Knack and Keefer, 1997; Utaka, 2003; Boulila et al., 2008; İbicioğlu et al., 2013; Gürgür and Kılınç, 2015; Chuku et al., 2017; Kasmaqui et al., 2018; Çoban and Balıkcıoğlu, 2020), investment decisions (Korkmaz and Çevik, 2007; Kahyaoğlu, 2011; Phan and Zhou, 2014; Riaz and Iqbal, 2015; Güngör, 2019; Combrink and Lew, 2019; Ul-Abdin et al., 2022), and consumer spending (Fan and Wong, 1998; Ludvigson, 2004; Croushore, 2005; Cotsomitis and Kwan, 2006; Erdoğan, 2007; Arisoy, 2012; Dees and Brinca, 2013; Mohd Haniff and Masih, 2016; Yamak et al., 2019). In addition, there are also studies investigating the effect of GDP on tax revenues (Marsden, 1983; Mendoza et al., 1995; Widmalm, 2001; Mamatzakis, 2005; Temiz, 2008; Taha et al., 2011; Ray et al., 2012; Karamelikli, 2018; Korkmaz et al., 2019; Radulovic, 2020; Arvin et al., 2021; Ho et al., 2023). However, studies examining the effect of confidence in the economy on tax revenues are limited (Fauvelle-Aymar, 1991; Kutbay and Buyrukoğlu, 2019; Yalçın and Güneş, 2023).

One of the most comprehensive studies analyzing the effect of confidence in the economy on tax revenues is by Fauvelle-Aymar (1991). This study, which covers the period from 1980 to 1989, examines the impact of economic, political, and cultural variables on tax revenues using a dataset of 86 developing countries. The outcomes indicate a robust relationship between government

legitimacy, efficiency, credibility, and high tax compliance. The study highlights that an environment characterized by predictability and continuity -essentially, government credibility- is a clear determinant of tax revenue levels. These findings underscore that, in addition to economic factors, indicators of government legitimacy and efficiency play a significant role in explaining the variation in tax revenues.

Kutbay and Buyrukoğlu (2019) analyzed the impact of the economic confidence index on tax revenues in Türkiye using data from 2007 to 2018. The research shows a positive and statistically meaningful long-run connection among economic confidence index and tax revenues. These findings indicate that tax revenues increase during periods of heightened economic confidence, underscoring the critical influence of economic confidence on tax revenues.

Yalçın and Güneş (2023) researched the relationship between economic confidence and income within the Turkish context. Utilizing quarterly data from 2007 to 2022, they applied the Gregory Hansen (1996) cointegration test and found a cointegration relationship between these variables. DOLS, FMOLS and CCR estimation results reveal that income and economic confidence have a positive and statistically significant effect on tax revenues. Specifically, a 1% increase in the economic confidence index was found to raise tax revenues by 0.26% through the DOLS estimator, 0.23% with the FMOLS estimator, and 0.28% with the CCR estimator over the long term. These results highlight the significant role of economic confidence in tax revenues and provide valuable insights for formulating and assessing economic policies. By analyzing the impact of economic confidence on tax revenues, this paper intends to enrich the literature. Studies in the Turkish context have generally focused on economic growth and macroeconomic indicators and have not comprehensively analyzed the connection between tax revenues and economic confidence. The difference between this study and the literature is that it empirically analyzes the impact of confidence in the economy and GDP on tax revenues using Türkiye-specific data and dynamics.

## 2. Methods and Findings

In the period 2007:Q1-2024:Q1, this study examines the impact of confidence in the Turkish economy on tax revenues. The following outlines the model of the study in this context:

$$\ln tax_t = \beta_0 + \beta_1 \ln gdp_t + \beta_2 \ln confidence_t + \varepsilon_t \quad (1)$$

where  $\beta_0$  is the constant term and  $\varepsilon_t$  is the error term. Table 1 presents detailed information about the variables examined in the empirical model:

**Table 1.** Variables and Sources

| Symbol               | Variables                 | Source |
|----------------------|---------------------------|--------|
| <i>ln tax</i>        | Tax Revenues              | EVDS   |
| <i>ln gdp</i>        | Gross Domestic Product    | EVDS   |
| <i>ln confidence</i> | Economic Confidence Index | TUIK   |

The study uses variables in logarithmic form. Using the variables in logarithmic form increases model stability by normalizing the distribution of the data and providing a more accurate interpretation of proportional changes. Table 2 shows descriptive data and a correlation matrix for the variables:

**Table 2.** Overview of Statistics and Correlations

|             | <i>ln tax</i> | <i>ln gdp</i> | <i>ln confidence</i> |
|-------------|---------------|---------------|----------------------|
| Mean        | 18.622        | 20.393        | 4.195                |
| Median      | 18.456        | 20.158        | 4.219                |
| Std. Dev.   | 0.95          | 0.981         | 0.101                |
| Skewness    | 0.965         | 0.925         | -2.147               |
| Kurtosis    | 3.353         | 3.162         | 9.201                |
| Jarque-Bera | 11.056        | 9.922         | 163.579              |

According to the statistics given in Table 2, the standard deviation values calculated for tax revenues and GDP indicate that the levels of variability are significant. In terms of skewness values, positive skewness for tax revenues and GDP indicates a skewed distribution to the right, while negative skewness for the economic confidence index indicates a skewed distribution to the left. In terms of kurtosis values, high values for tax revenues and GDP indicate that their distributions are more pointed than normal, while a more rounded distribution is observed for the economic confidence index. The Jarque-Bera test reveals that all variables are not normally distributed.

For determining the suitable equation to be used in the analysis, assessing the stationarity of the time series is important. It is widely acknowledged that most economic time series display unit roots. This means that economic time series show a stochastic trend and their averages may change over time. Therefore, hypotheses that ignore this problem may not be valid.

Determining the appropriate equation for analysis requires first assessing the stationarity of the time series, as this is a fundamental aspect of time series analysis. Economic time series often exhibit unit roots, meaning they possess a stochastic trend that causes their statistical properties, such as mean and variance, to change over time. This characteristic implies that the averages of these series may not remain constant, and analyses that fail to account for this issue can lead to invalid conclusions.

A stationary time series, on the other hand, has constant statistical properties over time, including a stable mean, variance, and covariance. This property is critical for many econometric models to produce reliable results. Weak stationarity, also known as covariance stationarity or second-order stationarity, refers to a condition where these statistical properties do not change as time progresses. It represents the general and most widely used form of stationarity in applied research. In cases where the joint and conditional probability distributions of the stochastic process remain invariant over time, the series is deemed strictly stationary (Charemza and Deadman, 1993). However, for most practical applications, covariance stationarity is considered sufficient and is typically the primary focus in time series analysis.

To test for stationarity, the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test are the most commonly used methods. The ADF test, developed in 1981, extends the classic Dickey-Fuller (1979) test to address its limitations, particularly its inability to handle autocorrelation in the residuals. In the original Dickey-Fuller test, the presence of autocorrelated error terms could lead to unreliable results. The ADF test resolves this issue by including lagged differences of the dependent variable in the regression equation, thereby effectively removing autocorrelation and improving the robustness of the test (Dickey and Fuller, 1979). In their 1988 study, Phillips and Perron introduced a further generalization of the Dickey-Fuller test by relaxing its strict assumptions regarding error terms. Unlike the ADF test, which explicitly adds lagged terms to address autocorrelation, the Phillips-Perron test employs a nonparametric correction approach. This allows it to account for both autocorrelation and heteroskedasticity in the error terms without modifying the regression equation. As a result, the PP test provides a flexible and robust method for detecting unit roots, making it a valuable tool for evaluating the stationarity of time series data. Together, these tests form a crucial part of time series analysis by helping researchers distinguish between stationary and non-stationary processes, thereby ensuring the validity of econometric models and hypotheses based on the data.

Table 3 shows the results of the ADF and PP unit root tests:

**Table 3.** Results of the Unit Root Tests

| Variables             | ADF     |          | Phillips-Perron |          | Decision |
|-----------------------|---------|----------|-----------------|----------|----------|
|                       | t-Stat. | Prob.    | t-Stat.         | Prob.    |          |
| <i>lntax</i>          | -1.358  | 0.968    | -1.532          | 0.867    | I(1)     |
| $\Delta lntax$        | -7.698  | 0.000*** | -8.471          | 0.000*** |          |
| <i>lngdp</i>          | -2.234  | 0.440    | 0.759           | 0.997*** | I(1)     |
| $\Delta lngdp$        | -8.275  | 0.000*** | -8.482          | 0.000*** |          |
| <i>lnconfidence</i>   | -1.512  | 0.846    | -2.967          | 0.149    | I(1)     |
| $\Delta lnconfidence$ | -6.794  | 0.000*** | -6.919          | 0.000*** |          |

Note: \*\*\*prob. <0.01

In Table 3, which shows the findings of the unit root tests applied to verify the presence of unit roots in the series, in other words, whether they are stationary or not, it is seen that the variables become stationary when they are differenced.

Once the stationarity of the series has been confirmed through appropriate tests, traditional cointegration analyses become applicable to examine the long-term equilibrium relationships between time series. Cointegration reflects a statistical property indicating that even though individual series may be non-stationary, their linear combinations can produce a stationary series, suggesting a stable long-term relationship. For such analyses, all series must be integrated of the same order, typically I(0) or I(1), as this ensures compatibility in their dynamic behavior. Among the available methods, the Engle-Granger (1987) test was the first to be developed, and it operates by estimating a single cointegration equation using ordinary least squares. However, its reliability diminishes in models involving more than two variables because it cannot capture multiple cointegration relationships and is sensitive to the choice of normalization, potentially leading to inconsistent results. To address these limitations, the Johansen (1988) and Johansen-Juselius (1990) approaches were introduced, offering a more robust methodology. These methods employ a maximum likelihood estimation technique within a vector autoregressive framework to identify all possible cointegration vectors in multivariate systems. As a result, the Johansen methodology is widely preferred in empirical research, particularly when dealing with complex systems with multiple interacting variables, as it provides a comprehensive and statistically rigorous analysis of long-term equilibrium dynamics.

To carry out the Johansen cointegration analysis, it is crucial to identify the correct model in several stages. In the beginning, the VAR model should be established and the lag length should be estimated. In the next phase, the VAR model should be re-established by considering the lag length found. In the third step, the appropriate model for cointegration analysis should be found, and in the final step, the cointegration analysis should be carried out. Consequently, Table 4 presents the lag length of the VAR model:

**Table 4.** Lag Length Estimation with VAR Model

| Lag | LogL    | LR             | FPE              | AIC            | SC             | HQ             |
|-----|---------|----------------|------------------|----------------|----------------|----------------|
| 0   | 191.390 | NA             | 4.61e-07         | -6.077         | -5.974         | -6.037         |
| 1   | 199.044 | 14.321         | 4.81e-07         | -6.034         | -5.622         | -5.872         |
| 2   | 210.950 | 21.122         | 4.39e-07         | -6.127         | -5.407         | -5.845         |
| 3   | 240.299 | 49.230         | 2.29e-07         | -6.784         | -5.755         | -6.380         |
| 4   | 284.562 | <b>69.965*</b> | <b>7.42e-08*</b> | <b>-7.921*</b> | <b>-6.583*</b> | <b>-7.396*</b> |
| 5   | 290.430 | 8.707          | 8.35e-08         | -7.820         | -6.174         | -7.174         |
| 6   | 302.501 | 16.743         | 7.76e-08         | -7.919         | -5.964         | -7.152         |

**Note:** \* indicates the optimal lag length chosen based on the information criterion.

According to this table, lag=4 is the most appropriate lag length, because all statistical criteria (AIC, SC, HQ, FPE, LR) show that this lag number provides the best fit and best predictive power of the model. Therefore, lag=4 should be preferred for the model to be used in the analysis.

After determining the lag length, the null hypothesis, stated as “no cointegration relationship exists between the dependent and independent variables” was tested. The Trace test findings obtained in this context are given in Table 5:

**Table 5.** Findings from the Johansen Cointegration Analysis

|              | Eigenvalue | Trace Statistic | %5 Critical Value | Prob. |
|--------------|------------|-----------------|-------------------|-------|
| $r = 0^*$    | 0.494      | 66.147          | 24.276            | 0.000 |
| $r \leq 1^*$ | 0.297      | 22.526          | 12.321            | 0.001 |
| $r \leq 2$   | 0.000      | 0.000           | 4.130             | 0.998 |

Based on the results of the Trace test shown in Table 5, given that the test statistic values are higher than the critical values at the 5% significance level, the hypothesis  $H_0$  ( $r = 0$ ), which states that there is no cointegration relationship between tax revenues, GDP and the economic confidence index, is rejected. Likewise, the hypothesis suggesting that there is a maximum of 1 cointegration relationship between tax revenues, GDP, and the economic confidence index ( $r \leq 1$ ) is also rejected. As a result, it is revealed that there are at least 2 cointegration vectors between tax revenues, GDP, and the economic confidence index over the long term

Once the cointegration relationship was established, the short-term dynamics and direction of the variables were examined through causality analysis. Granger (1988) stated that if cointegration is detected between variables, at least one causal relationship will exist between them. Granger causality analysis is estimated based on the VAR model. The condition of VAR model estimation is that the analysis should be performed with stationary data. In other words, to apply the Granger (1969) causality test, the series should be stationary, i.e., they should not be  $I(1)$  or their stationarity degrees should not be of different orders. In this case, non-stationary series are stationaryized by taking differences, and after the cointegration test, it is recommended to use the Vector Error Correction Model (VECM) for causality analysis. VECM is included in the VAR (Vector Autoregressive) framework and is intended to correct the error shifts arising from the differencing process in non-stationary series, thus preventing the loss of long-run relationships (Erdil Şahin, 2019: 70). It is stated that VECM estimation is more appropriate for non-stationary (differenced) series in the presence of cointegration between the series (Akkuş, 2021). While stationarity is achieved with the difference operation, some losses in long-run information may occur. Therefore, error-correction models are used to eliminate these imbalances. Error correction models express the deviation from the long-run relationship by returning to the long-term balance between the series.

Before interpreting the results of the VECM estimation, several diagnostic tests were conducted to validate the adequacy of the model. These include the Lagrange Multiplier (LM) test for autocorrelation, Jarque-Bera test for normality, and the ARCH-LM test for heteroskedasticity. All test results are reported in Appendix A. The LM test results indicated no significant autocorrelation in the residuals, while the Jarque-Bera test confirmed the normal distribution of residuals. Additionally, the ARCH-LM test showed no evidence of conditional heteroskedasticity. These results confirm that the VECM model is well-specified and the statistical inference drawn from the model is reliable.

Table 6 presents the estimation results of the VECM:

**Table 6.** VECM Estimation Findings

| Variable        | Coefficient | Std. Error | t-Statistic       | Prob.    |
|-----------------|-------------|------------|-------------------|----------|
| D(LNGSYIH)      | 0.752       | 0.071      | 10.630            | 0.000*** |
| D(LNCONFIDENCE) | 0.144       | 0.117      | 11.236            | 0.000*** |
| ERRORTERMS(-1)  | -0.757      | 0.123      | -6.129            | 0.000*** |
| C               | 0.012       | 0.009      | 1.415             | 0.162    |
| $R^2$           |             | 0.664      | F-statistic       | 42.182   |
| Adj. $R^2$      |             | 0.648      | Prob(F-statistic) | 0.000*** |

Note: \*\*\*prob. <0.01

When the VECM estimation results given in Table 6 are analyzed, it is seen that the effect of the changes in GDP in the previous period correcting the error terms has an important role in the dynamics of the model. The explanatory power of the changes in the economic confidence index in the previous period, on the other hand, shows that it is effective in determining the imbalances of the model. In particular, the negative coefficient (-0.757) obtained for the previous period value of the error terms emphasizes that the past period errors have a significant effect on correcting the error terms in the current period.

To identify the causality relationships between the variables, Granger causality analysis was applied, and the findings are presented in Table 7:

**Table 7.** Results of the Granger Causality Analysis

| Hypothesis $H_0$                                                  | Test Stat. | df | Prob.  | Decision |
|-------------------------------------------------------------------|------------|----|--------|----------|
| GDP is not a Granger cause of tax revenues.                       | 2.698      | 2  | 0.259  | Accept   |
| Economic confidence index is not a Granger cause of tax revenues. | 4.646      | 2  | 0.098* | Reject   |

Note: \* prob. <0.10

The outcomes of the Granger causality analysis concerning tax revenues, the economic confidence index, and GDP variables reported in Table 7 reveal only the outcomes of the Granger causality analysis concerning tax revenues. A relationship of causality among the economic confidence index and tax revenues. These findings illustrate that changes in the economic confidence index can impact tax revenues in the short run. A sudden increase in the economic confidence index may support the confidence of consumers and businesses in the economy, leading consumers to spend more and businesses to invest. Increased consumption and investment activities can lead to a rise in tax revenues in the short term by boosting incomes and expanding the tax base.

## Conclusion

In the literature on economics, the effect of confidence in the economy on tax revenues is regarded as a critical issue. When confidence is lost, an increase in informal economic activities is often inevitable. Informality undermines the state's total tax revenue by negatively affecting tax collection, resulting in fewer resources for public expenditures. This situation may force the state to either increase borrowing to finance investments or restrict its investments. Additionally, the informal economy typically centers on low-value-added and low-profit-margin production activities, which often rely on unskilled labor. This can hamper the economy's efficiency and effectiveness, limiting long-term economic growth. Conversely, efficient tax systems and reduced informality can enhance the economy's competitiveness by promoting quality production and innovation and supporting a more equitable distribution of welfare. By providing competitive advantages, these measures can foster sustainable economic growth. Therefore, increasing confidence in the economy is crucial for boosting tax revenues and ensuring sustainable economic development.

The sustainability of tax revenues and the maintenance of economic stability are crucial for developing economies such as Türkiye. The objective of this study is to examine the effect of economic confidence on tax revenues in Türkiye. Utilizing Johansen cointegration analysis, the long-term correlations among tax revenues, GDP, and the economic confidence index were examined for the period between 2007:Q1 and 2024:Q1. The findings revealed the existence of at least two cointegration vectors, suggesting long-term relationships between the variables. Subsequently, the short-term dynamics and causal direction between the variables were analyzed using Granger causality analysis, and a VECM was estimated, given that the first differences of the variables became stationary. The VECM estimation results highlighted the significant role of changes in GDP from the previous period in correcting error terms, influencing the dynamics of the model. The changes in the economic confidence index from the previous period also effectively explained the imbalances within the model. Notably, the negative coefficient for the error terms from the past period indicates a significant effect in correcting these errors in the current period. The Granger causality analysis results reveal that the economic confidence index can affect changes in the short-term impact on tax revenues.

These findings are consistent with earlier studies showing that economic confidence plays a key role in economic activity. For example, previous research has confirmed that economic confidence supports economic growth (Matsusaka and Sbordone, 1995; Knack and Keefer, 1997; Utaka, 2003; Boulila et al., 2008; Gürgür and Kılınç, 2015), investment decisions (Korkmaz and Çevik, 2007; Phan and Zhou, 2014; Ul-Abdin et al., 2022), and consumer behavior (Fan and Wong, 1998; Ludvigson, 2004; Cotsomitis and Kwan, 2006; Yamak et al., 2019). In addition, there is evidence that GDP is an important determinant of tax revenues (Marsden, 1983; Mendoza et al., 1995; Taha et al., 2011; Radulovic, 2020). More directly, this study aligns with findings from Fauvelle-Aymar (1991), who emphasized that government credibility and legitimacy significantly influence tax compliance and revenue levels in developing countries. Similarly, Kutbay and Buyrukoğlu (2019) and Yalçın and Güneş (2023) provided empirical evidence for Türkiye showing that economic confidence has a long-term, statistically significant, and positive impact on tax revenues.

This study further contributes to the literature by confirming, with recent data and updated econometric techniques, that economic confidence is not only important for macroeconomic stability but also for maintaining a sustainable tax revenue structure. Therefore, the results reaffirm the idea that policymakers must foster a stable and trustworthy economic environment to ensure sustainable public finances.

The findings of this study enable the development of various policy recommendations to increase tax revenues and ensure economic stability in Türkiye. However, it should be noted that the Granger causality test results indicate a causal relationship from the economic confidence index to tax revenues at the 10% significance level. This implies a relatively weak short-term causal effect. Therefore, the policy recommendations should be interpreted with caution and viewed as complementary measures within a broader economic strategy. Firstly, the need to increase confidence in the economy is emphasized. In this context, policymakers need to take steps to increase transparency and strengthen accountability and anti-corruption policies. Strengthening tax administration and audits is also a critical requirement. Strict audits should be conducted to prevent tax evasion and reduce the informal economy, and tax compliance should be increased through technological solutions such as digitalization and data analytics. Improving the investment climate, facilitating business regulations, and ensuring a predictable business environment will also encourage the transition to the formal economy. Moreover, strengthening education policies and increasing the skilled labor force should be aimed at producing products and services with high added value. Sustainable development and innovation should be encouraged, and the introduction of high-value products and services into the economy should be supported. Finally, the efficiency of public financial management should be increased, and efficient use of public expenditures should be ensured through performance-based budgeting and fiscal discipline principles. Implementation of these policy recommendations can help Türkiye strengthen economic stability and contribute to long-term sustainable growth by increasing tax revenues. However, the effectiveness of the recommendations should be regularly evaluated in light of changing economic conditions and international developments.

#### Additional Information/Author Declarations

|                                                     |                                                                                                       |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Statement of Research and Publication Ethics</b> | This study does not require the approval of an ethics committee.                                      |
| <b>Conflict of Interest</b>                         | There is no conflict of interest arising from this study either for the authors or for third parties. |
| <b>Acknowledgment or Funding Statement</b>          | No support is taken from any institution or organization.                                             |
| <b>Author Contributions</b>                         | The contribution of Author 1 to the article is 100%.                                                  |

#### Kaynakça

- Akkuş, H. T. (2021). Kısa dönemli ilişki analizi. *Finansal Zaman Serisi Analizleri (Temel Yaklaşımlar)* içinde Çelik, İ. ve Bozkuş Kayhaoğlu, S. (Ed.), s. 254-298. Gazi Kitabevi.
- Arısoy, İ., (2012). Türkiye ekonomisinde iktisadi güven endeksleri ve seçilmiş makro değişkenler arasındaki ilişkilerin VAR analizi. *Maliye Dergisi*, 162, 304-315.
- Arvin, M. B., Pradhan, R. P., & Nair, M. S. (2021). Are there links between institutional quality, government expenditure, tax revenue and economic growth? Evidence from low-income and lower middle-income countries. *Economic Analysis and Policy*, (70), 468-489. <https://doi.org/10.1016/j.eap.2021.03.011>
- Asafo-Adjei, E., Boateng, E., Isshaq, Z., Idun, A. A. A., Owusu Junior, P., & Adam, A. M. (2021). Financial sector and economic growth amid external uncertainty shocks: Insights into emerging economies. *Plos One*, 16(11), e0259303. <https://doi.org/10.1371/journal.pone.0259303>
- Boulila, G., Bousrih, L., & Trabelsi, M. (2008). Social capital and economic growth: empirical investigations on the transmission channels. *International Economic Journal*, 22(3), 399-417. <https://doi.org/10.1080/10168730802287994>
- Charemza, W. W., & Deadman, D. F. (1993). *New direction in econometric practice*. Edward Elgar Publishing Limited.
- Chuku, C., Oduor, J., & Simpasa, A. (2017). Intelligent forecasting of economic growth for African economies: Artificial neural networks versus time series and structural econometric models. *Washington Research Program on Forecasting*, 1-28. <https://doi.org/10.1016/j.inteco.2019.06.001>

- Cogan, J. F., Cwik, T., Taylor, J. B., & Wieland, V. (2010). New Keynesian versus old Keynesian government spending multipliers. *Journal of Economic Dynamics and Control*, 34(3), 281-295. <https://doi.org/10.1016/j.jedc.2010.01.010>
- Combrink, S., & Lew, C. (2020). Potential underdog bias, overconfidence and risk propensity in investor decision-making behavior. *Journal of Behavioral Finance*, 21(4), 337-351. <https://doi.org/10.1080/15427560.2019.1692843>
- Cotsomitis, J. A., & Kwan, A. C., (2006). Can consumer confidence forecast household spending? Evidence from the European Commission business and consumer surveys. *Southern Economic Journal*, 72(3), 597-610. <https://doi.org/10.2307/20111835>
- Croushore, D., (2005). Do consumer confidence indexes help forecast consumer spending in real time? *The North American Journal of Economics and Finance*, 16(3), 435-450. <https://doi.org/10.1016/j.najef.2005.05.002>
- Çoban, H., & Balıkcıoğlu, E. (2020). Güven, inovasyon ve ekonomik büyüme ilişkisi. *Maliye Araştırmaları Dergisi*, 6(3), 1-16.
- Darnell, A. C. (1994). *A dictionary of econometrics*. Printed and Bound in Great Britain by Hartnolls Limited, Bodmin-Cornwall, England.
- Dees, S., & Brinca, P. S., (2013). Consumer confidence as a predictor of consumption spending: Evidence for the United States and the Euro Area. *International Economics*, 134, 1-14. <https://doi.org/10.1016/j.inteco.2013.05.001>
- Dickey, D., & Fuller, W. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366), 427-431. <https://doi.org/10.2307/2286348>
- Engle, R. F., & Granger, C. J. W. (1987). Cointegration and error correction representation, estimation, and testing. *Econometrica*, 55, 251-276. <https://doi.org/10.2307/1913236>
- Erdil Şahin, B. (2019). Türkiye’de enflasyon ve işsizlik arasındaki ilişkinin vektör hata düzeltme modeli ile analizi. *Mali Çözüm*, 29(152), 63-75.
- Erdoğan, O., (2007). Tüketim harcamaları ve güven. *Ekonomik Yaklaşım*, 18(64), 93-102.
- Fan, C. S., & Wong, P., (1998). Does consumer sentiment forecast household spending? The Hong Kong case. *Economics Letters*, 58(1), 77-84. [https://doi.org/10.1016/S0165-1765\(97\)00247-4](https://doi.org/10.1016/S0165-1765(97)00247-4)
- Fan, W., Anser, M. K., Nasir, M. H., & Nazar, R. (2023). Uncertainty in firm innovation scheme and impact of green fiscal policy; economic recovery of Chinese Firms in the post-covid-19 era. *Economic Analysis and Policy*, 78, 1424-1439. <https://doi.org/10.1016/j.eap.2023.04.002>
- Farooq, U., Gillani, S., Subhani, B. H., & Shafiq, M. N. (2023). Economic policy uncertainty and environmental degradation: The moderating role of political stability. *Environmental Science and Pollution Research*, 30(7), 18785-18797. <https://doi.org/10.1007/s11356-022-23479-7>
- Fauvelle-Aymar, C. (1999). The political and tax capacity of government in developing countries. *Kyklos*, 52(3), 391-413. <https://doi.org/10.1111/j.1467-6435.1999.tb00224.x>
- Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross spectral methods. *Econometrica*, 37(3), 424-438. <https://doi.org/10.2307/1912791>
- Gremi, E. (2013). Macroeconomic factors that affect the quality of lending in Albania. *Research Journal of Finance and Accounting*, 4(9), 50-57.
- Gurdal, T., Aydin, M., & Inal, V. (2021). The relationship between tax revenue, government expenditure, and economic growth in G7 countries: New evidence from time and frequency domain approaches. *Economic Change and Restructuring*, 54, 305-337. <https://doi.org/10.1007/s10644-020-09280-x>
- Güngör, S. (2019). Ekonomik güven endeksi ve finansal yatırım araçları getirileri arasındaki nedensellik ilişkisi: 2007-2017 döneminde ABD doları ve altın getirileri örneği. *Journal of Management and Economics Research*, 17(1), 22-39. <https://doi.org/10.11611/yea.463214>
- Gürgür, T., & Kılınç, Z. (2015). What drives the consumer confidence in Turkey? *Research Notes in Economics*, 17, 1-13.
- Ho, T. T., Tran, X. H., & Nguyen, Q. K. (2023). Tax revenue-economic growth relationship and the role of trade openness in developing countries. *Cogent Business & Management*, 10(2), 1-14. <https://doi.org/10.1080/23311975.2023.2213959>
- İbicioğlu, M., Kapusuzoğlu, A., & Karan, M. (2013). Türkiye’deki tüketici güven endeksi ile döviz kuru arasındaki ilişkinin ampirik analizi. *İşletme Araştırmaları Dergisi*, 5(1), 5-16.
- Johansen, S. (1988). Statistical analysis of cointegrated vectors. *Journal of Economic Dynamics and Control*, 12, 231-54. [https://doi.org/10.1016/0165-1889\(88\)90041-3](https://doi.org/10.1016/0165-1889(88)90041-3)

- Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration: With application to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210. <https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x>
- Kahyaoglu, M. B. (2011). Yatırım kararlarına etki eden çeşitli duygusal ve psikolojik faktörlere maruz kalma düzeyi üzerinde cinsiyetin rolü: İMKB bireysel hisse senedi yatırımcıları üzerine bir uygulama. *Ekonomik ve Sosyal Araştırmalar Dergisi*, 7(1), 29-51.
- Karamelikli, H., (2018). Dolaylı ve dolaysız vergilerin ekonomik aktiviteler üzerindeki simetrik ve asimetrik etkileri. *Maliye ve Finans Yazıları*, 110, 95-110. <https://doi.org/10.33203/mfy.372284>
- Kasmaqui, K., Mughal, M. & Bouoiyour, J. (2018). Does trust influence economic growth? Evidence from the Arab World. *Economics Bulletin*, 38(2), 880-891.
- Kassa, E. T. (2021). Factors influencing taxpayers to engage in tax evasion: Evidence from Woldia City administration micro, small, and large enterprise taxpayers. *Journal of Innovation and Entrepreneurship*, 10(1), 8. <https://doi.org/10.1186/s13731-020-00142-4>
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? *Quarterly Journal of Economics*, 112, 1251-1288.
- Korkmaz, S., Yılgor, M., & Aksoy, F., (2019). The impact of direct and indirect taxes on the growth of the Turkish economy. *Public Sector Economics*, 43(3), 311-323. <https://doi.org/10.3326/pse.43.3.5>
- Korkmaz, T., & Çevik, E. İ. (2007). Davranışsal finans modellerinden aşırı güven hipotezinin geçerliliği: İMKB’de bir uygulama. *İktisat İşletme ve Finans Dergisi*, 22(261), 137-154. <https://doi.org/10.3848/iif.2007.261.5640>.
- Kutbay, H., & Buyrukoğlu, S. (2019). Ekonomideki güven artışı vergi gelirlerine yansır mı? *Vergi Dünyası*, 10(26), 35-47.
- Ludvigson, S. C., (2004). Consumer confidence and consumer spending. *Journal of Economic Perspectives*, 18(2), 29-50. <https://doi.org/10.1257/0895330041371222>
- Maganya, M. H. (2020). Tax revenue and economic growth in developing country: An autoregressive distribution lags approach. *Central European Economic Journal*, 7(54), 205-217. <https://doi.org/10.2478/ceej-2020-0018>
- Mamatzakis, E. C. (2005). The dynamic responses of growth to tax structure for Greece. *Applied Economics Letters*, 12(3), 177-180. <https://doi.org/10.1080/1350485042000318420>
- Marsden, K., (1984). Links between taxes and economic growth. World Bank Staff, *Working Papers*, No. 605.
- Matsusaka, J., & Sbordone, A. (1995). Consumer confidence and economic fluctuations. *Economic Inquiry*, 33(2), 296-318. <https://doi.org/10.1111/j.1465-7295.1995.tb01864.x>
- Mendoza, E. G., Milesi-Ferretti, G. M., & Patrick, A., (1996). On the ineffectiveness of tax policy to alter long-run growth: Harberger’s superneutrality conjecture. *Federal Reserve Board of Governors*. [https://doi.org/10.1016/S0047-2727\(97\)00011-X](https://doi.org/10.1016/S0047-2727(97)00011-X)
- Mohd Haniff, N., & Masih, M., (2016). Does consumer sentiment predict consumer spending in Malaysia? An autoregressive distributed lag (ARDL) approach. *MPRA Paper*, No. 69769.
- Owusu, G. M. Y., Bart-Plange, M.-A., Koomson, T. A. A., & Arthur, M. (2022). The effect of personality traits and tax morale on tax evasion intention. *Journal of Financial Crime*, 29(1), 272-292. <https://doi.org/10.1108/JFC-02-2021-0026>
- Phan, K. C., & Zhou, J. (2014). Factors influencing individual investor behavior: An empirical study of the Vietnamese stock market. *American Journal of Business and Management*, 3(2), 77-94. <https://doi.org/10.11634/216796061706527>
- Radulović, M. (2020). The impact of institutional quality on economic growth: A comparative analysis of the EU and non-EU Countries of Southeast Europe. *Economic Annals*, 65(225), 163-181. <https://doi.org/10.2298/EKA2025163R>
- Ray, S., Pal, M. K., & Ray, I. A. (2012). A causality analysis on tax growth nexus in India:1950-51 to 2011-12. *Journal of Expert Systems*, 1(4), 104-114.
- Riaz, T., & Iqbal, H. (2015). Impact of overconfidence, illusion of control, self-control and optimism bias on investors decision making; evidence from developing markets. *Research Journal of Finance and Accounting*, 6(11), 110-116.
- Salé, M. J., Muharremi, O., & Hoxhaj, M. (2021). Albanian individual taxpayers perceptions and determinants on ethical behavior regarding tax compliance. *Business Ethics and Leadership*, 5(1), 66-80. [https://doi.org/10.21272/bel.5\(1\).66-80.2021](https://doi.org/10.21272/bel.5(1).66-80.2021)
- Schwab, C. M., Stomberg, B., & Xia, J. (2022). What determines effective tax rates? The relative influence of tax and other factors. *Contemporary Accounting Research*, 39(1), 459-497. <https://doi.org/10.1111/1911-3846.12720>
- Taha, R., Nanthakumar, L., & Colombage, S. (2011). The effect of economic growth on taxation revenue: The case of a newly industrialized country. *International Review of Business Research Papers*, 7(1), 319-329.
- Temiz, D. (2008). Türkiye’de vergi gelirleri ve ekonomik büyüme ilişkisi: 1960-2006 dönemi. 2. *Ulusal İktisat Kongresi*, 1-18.

- Ul Abdin, S. Z., Qureshi, F., Iqbal, J., & Sultana, S. (2022). Overconfidence bias and investment performance: A mediating effect of risk propensity. *Borsa Istanbul Review*, 24(2), 780-793. <https://doi.org/10.1016/j.bir.2022.03.001>
- Utaka, A. (2003). Confidence and real economy-The Japanese case. *Applied Economics*, 35(3), 337-342. <https://doi.org/10.1080/00036840210135205>
- Visco, I., & Zevi, G. (2020). Bounded rationality and expectations in economics. In *Routledge Handbook of Bounded Rationality* (pp. 459-470). Routledge. <https://doi.org/10.2139/ssrn.3680762>
- Widmalm, F., (2001). Tax structure and growth: Are some taxes better than others? *Public Choice*, 107, 199-219. <https://doi.org/10.1023/A:1010340017288>
- Yalçın, E., & Güneş, S. (2023). Vergi gelirleri ve ekonomiye duyulan güven arasındaki ilişki: Türkiye analizi. *Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 10(1), 32-42. <https://doi.org/10.30803/adusobed.1202302>
- Yamak, R., Yamak, N., & Erkan E. (2019). Tüketim fonksiyonu ve tüketici güven endeksi. *Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 10(19), 511-532.

## APPENDIX

### Appendix A. VECM Diagnostic Test Results

| Test            | Null Hypothesis                    | Test Statistic | p-value | Decision                     |
|-----------------|------------------------------------|----------------|---------|------------------------------|
| LM Test (Lag 1) | No autocorrelation                 | 3.638          | 0.412   | Do not reject H <sub>0</sub> |
| Jarque-Bera     | Residuals are normally distributed | 1.966          | 0.374   | Do not reject H <sub>0</sub> |
| ARCH-LM (Lag 1) | No ARCH effects                    | 2.123          | 0.149   | Do not reject H <sub>0</sub> |