Journal of Economic Integration
https://www.e-jei.org/
Online first: April 2026
https://doi.org/10.11130/jei.2025030
ⓒ 2026-Center for Economic Integration, Sejong University, All Rights Reserved.
pISSN: 1225-651X eISSN: 1976-5525

Dynamic Interactions Between Monetary Policy, Real Sector Confidence, Capacity Utilization, and Foreign Trade: Evidence from Türkiye

ELIF MERYEM YURDAKUL ŞİPAL+

Yenipazar Vocational School, Aydın Adnan Menderes University, Aydın, Turkey

Abstract This study examines the dynamic relationships between monetary policy, real sector confidence, capacity utilization, and foreign trade in Türkiye using a Structural Vector Autoregression (SVAR) model based on monthly data from the period 2013:01-2025:08. The findings reveal that monetary policy shocks significantly affect real sector confidence, production capacity, and trade performance through expectation and supply channels. Increases in policy interest rates lead to short-term declines in confidence and capacity utilization, followed by a delayed and weaker impact on trade volume. The effects are short-lived and diminish within nine months, confirming the temporary nature of monetary policy transmission. The study contributes to the literature by combining these key macroeconomic variables within a single analytical framework. Policy recommendations emphasize the importance of developing early warning mechanisms for expectation management, monetary-fiscal coordination, and real sector dynamics.

Keywords: Monetary Policy, Structural VAR, Real Sector Confidence, Capacity Utilization, Foreign Trade, Expectations Channel

JEL Classifications: E52, C32, E32, F14, E44

Received 18 October 2025, Revised 28 November 2025, Accepted 16 December 2025

I. Introduction

Recent financial fluctuations in the global economy, post-pandemic recovery processes, and geopolitical uncertainties have necessitated a reassessment of the effects of monetary policy on the real economy. In particular, changing monetary policy regimes since the 2008 global crisis have made the impact of financial conditions on the real sector more complex. Recent literature (IMF, 2024; OECD, 2025) emphasizes that the interactions between monetary policy and the real sector have regained importance in terms of ensuring economic stability.

In Türkiye specifically, the trajectory over time of the effects of monetary policy decisions on production capacity, real sector expectations, and foreign trade has become a critical area of analysis for policymakers. Indicators such as the real sector confidence index and capacity

+Corresponding Author: ELIF MERYEM YURDAKUL ŞİPAL
Assistant Professor, Yenipazar Vocational School, Aydın Adnan Menderes University, Aydın 09010, Türkiye.
Tel: +90-5324808638, E-mail: eyurdakul@adu.edu.tr

utilization rate provide important information about expectations and production potential, which play a decisive role in the production and investment decisions of economic units. The volume of foreign trade reflects global demand conditions and the degree of openness of the economy, allowing for the measurement of external effects on growth. The interactions between these indicators are of great importance in understanding the effectiveness of monetary policy channels and how transmission mechanisms work. In particular, the impact of the expectations channel on capacity utilization and foreign trade is gaining increasing importance in the literature for understanding production and investment cycles. Over the past two decades, the Turkish economy has undergone significant structural transformations stemming from both the global economic environment and domestic dynamics; the relationships between monetary policy implementation, real sector behavior, and foreign trade performance have become increasingly complex over time. Therefore, analyzing these relationships not only at the simultaneous level but also in terms of their dynamic effects is critical for the design of macroeconomic stability policies.

This study aims to examine the dynamic relationships between monetary policy, real sector expectations, production capacity, and foreign trade in the Turkish economy within the framework of a structural vector autoregression (SVAR) model. Using monthly data from the period 2013: 01-2025:08, the effects of shocks in the policy interest rate on real sector confidence, capacity utilization rate, and foreign trade have been analyzed over time. This approach reveals not only long-term relationships but also the dynamic responses to shocks and the direction of causality between variables.

The motivation for integrating monetary policy, real sector confidence, capacity utilization, and foreign trade into a unified analytical framework stem from the structural characteristics of emerging economies such as Türkiye. These variables are not independent channels but rather components of an interconnected macroeconomic transmission mechanism. Monetary policy decisions influence firms' expectations almost immediately, shaping confidence levels; confidence affects production planning and investment decisions, which in turn determine capacity utilization; and both variables ultimately feed into external trade dynamics through supply conditions and competitiveness. Analyzing these channels separately would overlook these sequential and mutually reinforcing linkages. Therefore, examining them jointly within an SVAR framework provides a more coherent understanding of how monetary policy shocks propagate through the real economy.

The main objective of this study is to determine the magnitude, direction, and duration of the effects of monetary policy shocks on real sector indicators and foreign trade, thereby revealing the role of expectations and production channels in the macroeconomic transmission mechanism. In this respect, the study aims to contribute to the literature and produce findings that guide policymakers by revealing the dynamic nature of the relationship between monetary policy and the real sector in the Turkish economy.

II. Literature Review

The effects of monetary policy on the real economy, its interactions with the expectations channel, capacity utilization, and foreign trade dynamics constitute one of the most important areas of research in macroeconomic analysis. Numerous studies in the literature examine these relationships using different data sets, methods, and country examples.

Bernanke and Blinder (1992) showed that the effects of monetary policy on the real sector emerge through interest rate and credit channels, and that this effect is spread over time. Christiano, Eichenbaum, and Evans (1999) used a structural VAR approach to reveal the delayed and temporary effects of monetary policy shocks on production and investment. Peersman and Smets (2003) similarly showed that monetary policy shocks had significant effects on production and prices in the Eurozone. Specifically for Türkiye, Arısoy (2012) examined the relationship between economic confidence indices and macroeconomic variables using a VAR model and revealed that the real sector confidence index plays an important role as a leading indicator of economic cycles. Durgun (2019) also analyzed the interactions between consumer and real sector confidence indices and selected macroeconomic indicators, pointing to the importance of monetary policy transmission through the expectations channel.

In recent years, more detailed empirical analyses have been conducted on the real sector confidence index. Akkaya (2023) analyzed the macroeconomic variables affecting real sector confidence in Türkiye and found that the exchange rate, industrial production, and interest rates are decisive factors in expectations. Bicil and Başarır (2022) also examined the relationship between the real sector confidence index and industrial production in terms of symmetric and asymmetric effects and showed that the expectation indicator significantly affects production decisions. Confidence indicators are closely related not only to the real sector but also to financial markets. Alagöz (2024) analyzed the interaction between the real sector confidence index and stock returns, revealing that expectations also affect financial markets. Yıldız (2023) examined the long-term relationship between financial development and real sector confidence using ARDL and Toda-Yamamoto Granger causality tests, emphasizing the link between financial sector dynamics and expectation indicators. Tita et al. (2025) addressed the interaction between the stock market and real sector confidence and showed that financial fluctuations can affect real expectations. Similar findings are also noteworthy in examples outside Türkiye. Hardi et al. (2024) revealed that real sector confidence in Indonesia is determined by macroeconomic indicators in the long term. Alif et al. (2025) analyzed the effect of the consumer confidence index on credit growth, demonstrating the relationship between expectation indicators and financial intermediation mechanisms. In Brazil, Marques and Pinto (2024) analyzed the persistence characteristics of economic uncertainty, expectations, and confidence indicators, emphasizing the role of confidence in economic cycles. Suhányiová, Suhányi, and Kočišová (2023) also revealed the relationship

between production, prices, interest rates, and business confidence in the context of sustainable production. Gong (2024) examined the effects of monetary policy shocks on real economic activity through financial market fluctuations and the external trade channel. The study emphasizes that import performance responds asymmetrically to local monetary policy decisions and that financial market instability strengthens this transmission process. These findings show that the effects of monetary policy on foreign trade in open economies vary depending on the country's structure and market depth. The results obtained are similar to the findings of this study regarding the foreign trade channel for the Turkish economy.

The capacity utilization rate (CUR) is an important indicator reflecting production potential, domestic demand pressure, and the cyclical state of the industrial sector. Albayrak (2018) examined the mutual interaction between the real sector confidence index and the capacity utilization rate in Türkiye, revealing a strong relationship between the two indicators. Daver (2023) showed that the relationship between bank loans and the capacity utilization rate is decisive for economic activity. Demir and Özcan (2023) analyzed the asymmetric relationship between industrial production, capacity utilization rate, and producer prices using a nonlinear ARDL model, emphasizing the impact of changes in capacity utilization on production dynamics.

The relationship between the overall structure and key indicators of the industrial sector and economic confidence was examined by Koç, Kaya, and Şenel (2017), who demonstrated that real sector indicators move in tandem with confidence indices. Studies examining the relationship between capacity utilization rate and foreign trade also exist. Aktepe and Yumuş (2023) analyzed the relationship between the manufacturing industry capacity utilization rate and export value in Türkiye, showing that an increase in capacity utilization positively affects foreign trade performance. Salihoğlu (2023) examined the effects of real sector confidence and banking sector variables on foreign trade payment methods, revealing the relationship between real indicators and foreign trade channels.

Recent studies have examined the interactions between real sector confidence indicators and financial markets and foreign trade within a broader framework. Alagöz (2024) and Tita et al. (2025) demonstrate that financial markets have strong links with expectation indicators, and that these links can also influence real sector dynamics. Yıldız (2023) emphasizes that financial development has a two-way relationship with real sector expectations. On the foreign trade side, Aktepe and Yumuş (2023) and Salihoğlu (2023) shed light on the links between production capacity, real sector confidence, and foreign trade performance.

A review of the literature reveals that most studies analyzing the effects of monetary policy shocks on the real sector, production capacity, expectations, and foreign trade either focus on a single channel or address bilateral relationships. Furthermore, research that analyzes the dynamics between real sector confidence, capacity utilization rate, foreign trade, and monetary policy in an integrated manner within the same model is quite limited. This study aims to fill this gap

and analyzes the dynamic relationships between monetary policy, real sector confidence, capacity utilization rate, and foreign trade in Türkiye using monthly data from 2013-2025 within the framework of a structural VAR (SVAR) model. Thus, the short- and long-term effects of monetary policy shocks on the real economy are examined holistically through the channels of expectations, supply, and foreign trade, providing important insights for policymakers.

This study contributes to the existing literature in several distinct ways. First, unlike previous research that typically examines monetary policy, confidence, capacity utilization, or trade dynamics in isolation, this paper integrates these four channels into a unified structural framework, thereby capturing their sequential and mutually reinforcing interactions. Second, the analysis employs a long and updated monthly dataset that spans multiple policy regimes, allowing for a more comprehensive assessment of Türkiye's evolving macroeconomic structure. Third, the paper highlights the role of real sector confidence as an intermediate transmission variable linking monetary policy to both domestic production capacity and foreign trade outcomes—an aspect that has been largely overlooked in the empirical literature. Finally, by focusing on an emerging market economy where expectations and supply constraints are especially influential, the study offers insights that complement findings from advanced-economy SVAR analyses.

III. Theoretical Framework and the Economic Significance of Variables

The primary objective of macroeconomic analysis is to reveal how variables within the economic system interact with each other and how these interactions manifest in economic fluctuations, growth dynamics, and policy effectiveness. In this context, the dynamic relationships between key macroeconomic indicators such as monetary policy, expectations, production capacity, and foreign trade occupy a central position in both theoretical and applied economics literature. In particular, the global crises experienced in recent years, supply and demand shocks, and rapid changes in monetary policy have necessitated a reassessment of these relationships (Coccia & Russo, 2025; Tita et al., 2025).

The role of monetary policy in the real economy has long been interpreted through different theoretical perspectives. While classical and monetarist approaches emphasize the long-run neutrality of money and the predominance of nominal adjustments (e.g., Friedman, 1968; Friedman & Schwartz, 1963), New Keynesian models highlight price rigidities, expectations, and credit conditions as key mechanisms explaining the short-run real effects of monetary policy (Clarida, Galí & Gertler, 1999; Woodford, 2003). In this study, we follow the New Keynesian view that expectations and financial conditions shape firms' short-term behavior and therefore link monetary policy decisions to real sector dynamics (Mishkin, 2007)

Recent studies have revealed that the expectations channel and communication policy play

a decisive role in the effectiveness of monetary policy. Levrero (2021) emphasizes that the transmission mechanism of monetary policy cannot be reduced solely to the interest rate channel; the effects of expectations and financial conditions must also be taken into account. This approach demonstrates that real sector confidence indices and expectation indicators are important tools for understanding the real effects of monetary policy.

The policy interest rate, which is the primary instrument of monetary policy decisions, is the starting point of the transmission mechanism extending from financial markets to the real sector. Changes in interest rates directly affect investment and consumption decisions, while also playing a decisive role in financial conditions and credit supply (Mishkin, 1995). Christiano, Eichenbaum, and Evans (1999) show that interest rate shocks create short-term effects on aggregate demand and output, and that these effects are amplified through the expectations channel. In the Turkish economy, the path of the policy interest rate in the 2013-2025 period was shaped by global liquidity conditions, exchange rate volatility, and domestic demand dynamics. In particular, the currency shock experienced in 2018, the pressures of the COVID-19 pandemic on supply and demand in 2020, and the expansionary monetary policy steps implemented after 2021 have made the effects of monetary policy on the real sector more visible. These developments show that the effects of monetary policy shocks on production, investment, and foreign trade occur through more complex channels in economies exposed to external shocks, such as Türkiye (Salihoğlu, 2023).

The expectations channel plays a key role in explaining the effects of monetary policy on the real economy. The Business Confidence Index (BCI) is one of the most important indicators reflecting firms' perceptions of the current economic situation and their expectations for the future. The direction of expectations directly influences investment and production decisions, thereby determining the course of economic cycles (Petersen, 2015). Empirical findings have revealed that the real sector confidence index is a leading indicator of macroeconomic activity. Arısoy (2012) found that the confidence index has a strong relationship with key variables such as industrial production, interest rates, and exchange rates. Akkaya (2022) showed that monetary policy, exchange rates, and external demand conditions are among the main factors determining real sector confidence. Furthermore, Alagöz (2024) examined the effects of real sector confidence on financial markets and revealed that changes in confidence levels showed significant correlations with stock returns. Yıldız (2023) identified a two-way causality between financial development and real sector confidence.

The capacity utilization rate (CU) is one of the key indicators showing the extent to which an economy's production potential is being utilized. As a supply-side variable, the CU is critical in terms of the efficient use of production factors, the capacity to respond to demand conditions, and the sustainability of growth (Gali, 2015). An increase in the capacity utilization rate enhances the efficiency of production factors, while low rates generally indicate stagnation or insufficient demand.

The capacity utilization rate in Türkiye has shown significant fluctuations, particularly during the 2018 currency crisis and the post-pandemic recovery period in 2020. Albayrak (2018) found a reciprocal causal relationship between real sector confidence and the capacity utilization rate. Demir and Özcan (2023) analyzed the asymmetric relationship between the capacity utilization rate, producer prices, and industrial production using a nonlinear ARDL model. Daver (2023) highlighted the two-way relationship between bank loans and the capacity utilization rate, revealing the impact of financial conditions on production capacity.

The volume of foreign trade (VFT) reflects an economy's degree of openness to the outside world and its level of integration into global production chains. Foreign trade plays an important role because monetary policy affects export and import decisions through the exchange rate and interest rate channels in its transmission mechanism (Dornbusch, 1976; Kim & Roubini, 2000). In Türkiye, foreign trade volume followed a sensitive course during the 2013-2025 period, responding to global demand conditions, exchange rate volatility, and changes in production capacity. Aktepe and Yumuş (2023) identified a positive relationship between the manufacturing industry capacity utilization rate and export value. Salihoğlu (2023) analyzed the effects of real sector confidence and banking sector indicators on foreign trade payment methods, while Koç, Kaya, and Şenel (2017) showed that the relationship between production capacity and economic confidence directly affects foreign trade performance.

From a theoretical standpoint, these four variables constitute a sequential and mutually dependent transmission mechanism that is particularly relevant for emerging markets. Monetary policy operates primarily through expectations, meaning that firms' confidence responds more rapidly than actual production variables. Confidence then shapes production planning and investment decisions, influencing how intensively existing capital stock is utilized. Capacity utilization, in turn, determines short-run supply conditions and marginal production costs, which directly affect external competitiveness and trade volumes. This chain of adjustment implies that monetary policy shocks first affect expectations, then domestic supply capacity, and finally external sector outcomes. Therefore, analyzing these variables within a single structural model is essential for capturing the full trajectory of macroeconomic adjustment triggered by policy changes.

The summarized theoretical framework demonstrates that monetary policy, expectations, production capacity, and foreign trade cannot be considered independently of one another. Economic stability and sustainable growth require these four elements to be evaluated together. The 2013-2025 period in the Turkish economy was shaped by the simultaneous impact of global shocks and domestic policy preferences; the effects of monetary policy decisions on the real sector were redefined through expectations, supply, and external demand channels. Therefore, the integrated analysis of the policy interest rate, real sector confidence index, capacity utilization rate, and foreign trade volume is critical for understanding macroeconomic interactions in the Turkish economy and developing effective policy designs.

IV. SVAR Model, Dataset, and Model Setup

In this study, the Structural Vector Autoregression (SVAR) model was used to analyze the dynamic effects of macroeconomic shocks on the policy rate and real sector indicators in the Turkish economy. The main reason for choosing the SVAR approach is that it allows the effects of monetary policy shocks on the real sector and foreign trade to be separated through the expectation (BCI) and supply (CU) channels. Furthermore, impulse-response and variance decomposition analyses enable a detailed examination of how the mutual relationships and causality directions between variables develop over time. In an economy such as Türkiye's, which is sensitive to external shocks and where the effects of monetary policy on the real sector are multidimensional, the SVAR approach provides significant advantages in understanding structural dynamics. The study uses monthly data for Türkiye covering the period 2013:01-2025:08.

SVAR models are an extension of the classical VAR approach proposed by Sims (1980), enabling the analysis of simultaneous interactions between variables through structural constraints based on economic theory (Blanchard & Quah, 1989; Kilian & Lütkepohl, 2017). This method provides a suitable framework, particularly for assessing the effects of the monetary policy transmission mechanism on the real sector and foreign trade. Classical VAR models assume all variables are endogenous and examine the effects of past values on the present. However, these models provide limited information about causality because they cannot identify simultaneous (same-period) relationships between variables. Developed to address this shortcoming, the SVAR model combines econometric structure with economic theory and applies constraints to directly model the structural relationships between variables.

The general form of the SVAR model can be represented as follows:

$$A_0 Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \epsilon_t$$

Here, Y_t represents the vector of endogenous variables, A_0 represents the coefficient matrix showing structural relationships within the same period, A_i represents the coefficient matrices representing lagged effects, and ϵ_t represents structural shocks. Structural shocks are economically interpretable; for example, a policy interest rate shock represents monetary shocks affecting the real sector and foreign trade.

The SVAR model enables the analysis of the transmission mechanism of monetary policy shocks to the real economy by defining not only lagged relationships but also the simultaneous responses of variables (Christiano, Eichenbaum & Evans (1999); Kim & Roubini (2000). This feature is the model's most important advantage in analyzing how policy changes are reflected in production, confidence, and foreign trade channels.

The variables used in the model were obtained from the Central Bank of the Republic of Türkiye (CBRT) Electronic Data Distribution System (EDDS) database. The analysis period was determined taking into account data availability, and all series are monthly.

The variables included in the study are as follows:

- Policy rate (lpol): This is the logarithm of the Turkish Central Bank's policy interest rate. It represents the short-term direction of monetary policy.
- Real sector confidence index (lbci): This indicates the real sector's economic expectations and perception of production. The confidence index is an important indicator of expectations that influences companies' future investment and production decisions.
- Capacity utilization rate (lcu): Shows the extent to which the industrial sector utilizes its current production capacity. It provides information about demand pressure and production dynamics.
- Foreign trade volume (ltth): The logarithmic value of the total of exports and imports, reflecting the openness of external demand and production activities.

The variances of the series were stabilized by taking the logarithms of the variables, and seasonal effects were eliminated. This strengthened the parametric stability of the model and ensured that the responses to shocks were measured in a stable manner.

In the model, it is assumed that the policy interest rate will affect real sector indicators through the monetary policy channel; conversely, real sector indicators (lbci, lcu, ltth) cannot determine the policy interest rate within the same period. Therefore, the order of variables in the structural model has been determined based on economic theory as follows:

$$\text{lpol} \rightarrow \text{lbci} \rightarrow \text{lcu} \rightarrow \text{ltth} \tag{1}$$

This ranking is based on the assumption that monetary policy is the most exogenous variable and that policy shocks first affect real sector expectations (lbci), then production capacity (lcu), and finally foreign trade (ltth). Real sector confidence can affect the capacity utilization rate, and changes in the capacity utilization rate can be reflected in the volume of foreign trade. The stationarity properties of the series were assessed using unit root tests, and the analysis vector was defined as follows:

$$Y_t = \left[lpol_t \ , \ lbci_t, \ lcu_t ltth_t \ \right] \tag{2}$$

The identification ordering adopted in the SVAR follows standard theoretical arguments regarding the relative speed at which macroeconomic variables respond to shocks. Monetary policy is placed first because interest rate decisions and financial conditions adjust contemporaneously.

Real sector confidence responds more quickly than actual production variables, reflecting the forward-looking nature of survey-based expectations. Capacity utilization adjusts more slowly as it reflects physical production decisions and short-run supply constraints. Foreign trade is positioned last because export and import volumes typically react with the longest delay, being tied to production planning, order cycles, delivery schedules, and external demand. This hierarchical structure—expectations adjusting fastest, production capacity next, and external trade last—has been widely acknowledged in the empirical transmission literature for emerging markets. Robustness checks using alternative plausible orderings confirmed that the qualitative results remain broadly consistent.

The model's lag length was determined using the information criteria (AIC, SIC, HQ) presented in the subsequent findings section; the SVAR estimation was performed based on the optimal number of lags obtained. Estimations were performed using Eviews software. In this context, the structural constraints of the model are based on the assumption that the policy interest rate is exogenous, while other variables are considered endogenous in a stepwise manner. Thus, the model allows for a dynamic examination of the effects of macroeconomic shocks on the real sector and foreign trade channels. At this stage, the theoretical basis of the model, the structure of the variables, and the econometric framework have been defined. The next section will present the empirical findings, unit root tests, lag length selection, and impulse-response analyses in detail.

V. Empirical Findings

In this section, the stationarity properties of the series were examined using the Augmented Dickey-Fuller (ADF) test.

Table 1. *ADF Unit Root Test Results*

Variables	ADF Test at Level		Variables	ADF at first difference	
	C	C& T		C	C& T
lpol	-1.943 (0.311)	-3.083 (0.114)	lpol	-4.834 (0.000)	-4.819 (0.000)
lbci	-4.362 (0.000)	-4.332 (0.000)			
lcu	-3.225 (0.000)	-3.212 (0.089)			
ltth	-1.749 (0.402)	-2.435 (0.388)	ltth	-14.988 (0.000)	-14.932 (0.000)

According to the test results in Table 1, the variables exhibit mixed integration degrees. This supports the applicability of the SVAR approach. The tests were conducted under fixed

and fixed-trend specifications, and the lag lengths were determined using information criteria. The results obtained indicate that the lbci and lcu series are stationary at the level (I(0)), while the lpol and ltth series are stationary at the first difference (I(1)). In line with these findings, non-stationary series were used in the SVAR system after taking their first differences.

The test results indicate mixed degrees of integration among the variables and confirm that the vectorization $[\Delta lpol,\ lbci,\ lcu,\ \Delta ltth]$ is appropriate in the SVAR system. Prior to SVAR estimation, the optimal lag length p was determined in the VAR model, which is the reduced-form counterpart of the structure, using information criteria (Akaike—AIC, Schwarz—SIC, Hannan-Quinn—HQ). Considering the monthly data structure and possible autocorrelation dynamics, the range $p \in [1,6]$ was evaluated. The majority of the criteria suggested p = 3; therefore, the SVAR estimations were performed with a lag of p = 3. The optimal lag length selection results are presented in Table 2.

Table 2. *Selection of VAR Delay Length*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	403.913	NA	2.050	-10.956	-10.831	-10.906
1	506.993	192.039	1.897	-13.342	-12.714*	-13.092*
2	526.252	33.768	1.739	-13.431	-12.302	-12.981
3	**543.310**	**28.040***	**1.702**	**-13.460***	**-11.828**	**-12.810**
4	554.248	16.782	1.991	-13.321	-11.188	-12.471
5	569.930	22.341	2.088	-13.313	-10.677	-12.262
6	576.573	8.73609	2.824	-13.056	-9.9191	-11.806

The selected lag length indicates that there is no longer any significant autocorrelation in the terms and provides a suitable basis for transitioning to the SVAR estimation.

The validity of the estimated VAR model was tested using autocorrelation (LM test), residual normality (Jarque-Bera), heteroskedasticity (ARCH-LM), and model stability (AR roots) tests.

Table 3. *LM Autocorrelation Test Results*

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	24.005	16	0.089	1.542	(16, 171.7)	0.089
2	24.169	16	0.085	1.554	(16, 171.7)	0.086
3	17.787	16	0.336	1.123	(16, 171.7)	0.337
4	24.33	16	0.082	1.565	(16, 171.7)	0.082

The Lagrange multiplier (LM) test was applied to determine whether there was autocorrelation among the error terms in the model. The results presented in Table 3 indicate that there is no autocorrelation among the error terms in the reduced form of the model.

Figure 1. Inverse root AR characteristic polynomial

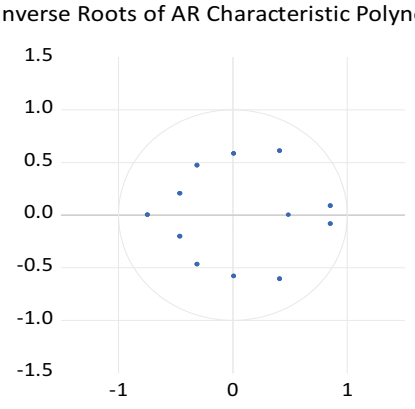


Figure 1 shows the inverse root AR characteristic polynomial. The fact that all roots lie within the unit circle confirms that the system is dynamically stable. The test results indicate that the model specification is statistically acceptable and that the system satisfies the stability conditions.

The evaluation of findings related to the SVAR model is typically conducted through impulse-response functions, which examine the responses of variables to structural shocks. Impulse-response analysis is used to reveal the dynamic effects of an unexpected shock in one variable included in the model on other variables. As a result of the analysis, it is expected that the impact of the shock will diminish over time and disappear in the long term, allowing the system to return to equilibrium. This section presents the impulse response function (IRF) and forecast error variance decomposition (FEVD) results obtained from the SVAR model. For expositional clarity, the impulse-response results are presented by variable; however, the full set of responses to each structural shock is available from the authors upon request.

Figure 2. Graphs of policy interest rate impact-response functions on other variables

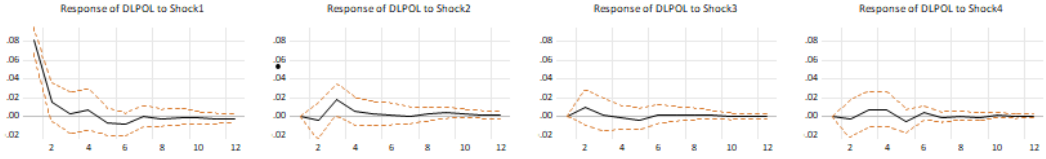
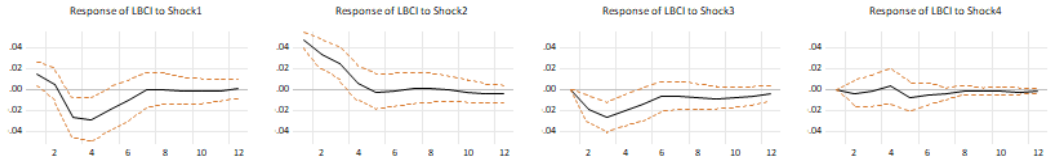


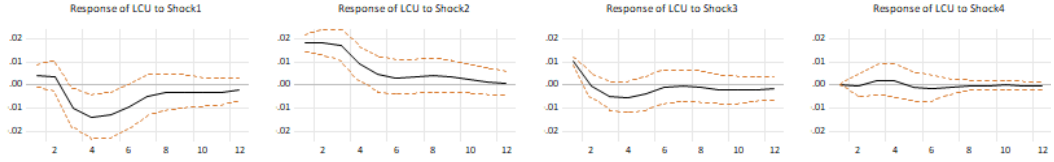
Figure 2 illustrates the effects of a structural shock in the policy interest rate on the real sector confidence index, capacity utilization rate, and foreign trade volume. According to the shown impact-response functions, the policy interest rate shock (Δlpol) produced a sharp positive response in the first period of the series, which gradually decreased from the second period onwards and approached equilibrium after the fifth month. This finding indicates that interest rate shocks create rapid effects in the short term through the monetary policy channel.

Figure 3. Graphs of the impact-response functions of the real sector confidence index on other variables



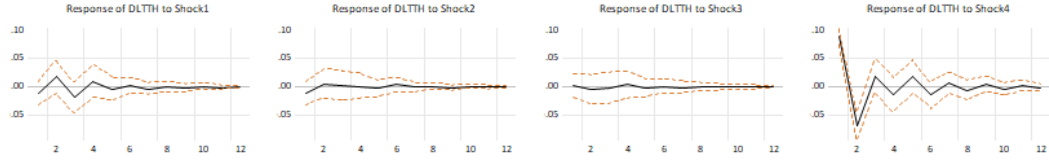
The responses of the real sector confidence index are presented in Figure 3. The real sector confidence index (lbci) reacts negatively in the short term to increases in the policy interest rate. A significant decline in the confidence indicator is observed within the first three months, while the effects weaken and approach zero from the sixth month onwards. This result indicates that the tightening of monetary policy negatively affects firms' expectations in the short term, but the effect is not permanent.

Figure 4. Graphs of the capacity utilization rate's effect-response functions on other variables



The responses of capacity utilization are shown in Figure 4. The capacity utilization rate (CUR) also reacts similarly to an interest rate shock. A limited decline is observed in the first two months, the effect becomes more pronounced in a negative direction from the third month onwards, and continues until approximately the ninth month. This situation indicates that interest rate increases create pressure on production potential in the short to medium term.

Figure 5. Graphs of the impact-response functions of foreign trade volume on other variables



The responses of foreign trade volume are presented in Figure 5. The volume of foreign trade (Δltth) exhibits the most delayed and fluctuating response to interest rate shocks. In the first two months, the foreign trade volume shows a slight decrease, and after the fourth month, the effects weaken and become statistically insignificant. This result indicates that the foreign trade channel responds more slowly and to a limited extent to monetary policy, and therefore,

real sector indicators are more sensitive to short-term policy changes.

Table 4. *Policy Interest Rate Variance Decomposition*

Variance Decomposition of DLPOL:					
Period	S.E.	DLPOL	LBCI	LCU	DLTTH
1	0.0815	100.000	0.000	0.000	0.000
2	0.0835	98.555	0.179	1.193	0.071
3	0.0856	93.853	4.316	1.172	0.657
4	0.0864	92.876	4.586	1.159	1.377
5	0.0869	92.310	4.603	1.310	1.775
6	0.0875	92.160	4.584	1.337	1.918
7	0.0875	92.075	4.581	1.385	1.957
8	0.0876	91.966	4.641	1.431	1.960
9	0.0877	91.793	4.794	1.449	1.963
10	0.0877	91.702	4.873	1.447	1.977
11	0.0878	91.659	4.919	1.445	1.975
12	0.0879	91.647	4.932	1.444	1.975

As reported in Table 4, the variance of the policy rate (ㅏlpol) is largely explained by its own internal dynamics (around 91–92%), while the contributions of other variables remain limited. This finding confirms the assumption that the policy rate behaves as the most exogenous variable in the model.

Table 5. *Real Sector Confidence Index Variance Decomposition*

Variance Decomposition of LBCI:					
Period	S.E.	DLPOL	LBCI	LCU	DLTTH
1	0.0507	8.990	91.009	0.000	0.000
2	0.064	6.209	85.458	8.092	0.239
3	0.078	15.595	67.503	16.735	0.165
4	0.086	24.089	56.715	18.860	0.334
5	0.089	26.464	52.795	19.823	0.915
6	0.090	27.137	51.789	19.956	1.116
7	0.090	26.984	51.531	20.207	1.275
8	0.090	26.813	51.252	20.664	1.269
9	0.090	26.612	50.870	21.236	1.281
10	0.091	26.449	50.553	21.719	1.277
11	0.091	26.309	50.430	21.960	1.300
12	0.091	26.226	50.415	22.049	1.308

As reported in Table 5, approximately 26% of the variance in the real sector confidence index (lbci) is explained by policy interest rate shocks, while 22% stems from the capacity

utilization rate. As the time horizon lengthens, the explanatory power of interest rate shocks increases, demonstrating the sensitivity of the expectations channel to monetary policy.

Table 6. *Capacity Utilization Rate Variance Decomposition*

Variance Decomposition of LCU:					
Period	S.E.	DLPOL	LBCI	LCU	DLTTH
1	0.0212	3.638	71.907	24.454	0.000
2	0.0282	3.756	82.415	13.813	0.015
3	0.0349	10.57	78.200	10.893	0.333
4	0.0391	21.111	67.630	10.768	0.489
5	0.0417	28.416	60.695	10.387	0.501
6	0.0429	31.540	57.961	9.907	0.590
7	0.0433	32.098	57.515	9.725	0.661
8	0.0436	32.134	57.561	9.645	0.658
9	0.0439	32.172	57.459	9.716	0.652
10	0.0442	32.379	57.093	9.880	0.646
11	0.0443	32.597	56.739	10.010	0.650
12	0.0444	32.711	56.543	10.086	0.657

As reported in Table 6, the results for the capacity utilization rate (CUR) indicate that a substantial portion of its variance is explained by real sector confidence and policy interest rate shocks. This finding indicates that the capacity utilization rate is highly dependent on confidence indicators, thus demonstrating that production capacity is closely related to expectations.

Table 7. *Variance Decomposition of Foreign Trade Volume*

Variance Decomposition of DLTTH:					
Period	S.E.	DLPOL	LBCI	LCU	DLTTH
1	0.091	1.554	1.684	0.142	96.618
2	0.115	3.350	1.327	0.263	95.058
3	0.118	5.473	1.287	0.260	92.979
4	0.119	6.154	1.275	0.374	92.195
5	0.121	6.137	1.298	0.381	92.182
6	0.122	6.082	1.412	0.381	92.122
7	0.122	6.122	1.408	0.396	92.072
8	0.122	6.114	1.411	0.397	92.077
9	0.122	6.137	1.412	0.397	92.052
10	0.122	6.136	1.416	0.397	92.049
11	0.122	6.140	1.415	0.398	92.045
12	0.122	6.140	1.417	0.398	92.043

As reported in Table 7, the variance of the foreign trade volume (ㅏltth) is largely explained by its own internal dynamics, indicating limited sensitivity to monetary policy shocks. However, the explanatory power of policy rate shocks is around 6%; this ratio indicates that foreign trade's sensitivity to monetary policy is limited but present.

VI. Conclusions and Policy Recommendations

This study examines the dynamic effects of monetary policy on real sector confidence, capacity utilization, and foreign trade volume in the Turkish economy using the Structural Vector Autoregression (SVAR) model. Using monthly data from the period 2013:01-2025:08, the study analyzes through which channels and to what extent monetary policy shocks are transmitted to the real sector. The main objective of the study is to measure the effects of monetary policy applications on real sector behavior and to reveal the persistence of these effects over time.

The analysis results show that increases in the policy interest rate reduce real sector confidence in the short term, weakening economic expectations and leading to a decline in the capacity utilization rate. Impact-response functions indicate that this effect lasts until approximately the ninth month, after which it gradually disappears. Therefore, monetary policy shocks create a short-term slowdown in the real sector, but their impact on production dynamics is temporary in the long run. Real sector confidence emerges as the most prominent channel transmitting the effects of monetary policy during this process. The capacity utilization rate is largely explained by changes in the confidence index; thus, the deterioration in expectations directly affects production plans. This finding reveals that the expectations channel plays a key role in monetary policy transmission and is consistent with similar results in the literature (Christiano et al., 1999; Peersman & Smets, 2003; Levrero, 2021; Coccia & Russo, 2025). The impact on foreign trade volume is relatively limited. Increases in the policy interest rate cause a short-term slowdown in export and import volumes, but the magnitude of this effect remains low compared to other variables. This indicates that foreign trade responds indirectly and with a lag to interest rate policy. Similarly, a study by Kim & Shin (2024) concluded that monetary policy affects production and trade behavior through household balance sheet and expectation channels. The results of the study reveal that the effectiveness of monetary policy is high in the short term but limited in the long term. The most important factor in the transmission of monetary policy decisions to the real sector is the management of expectations and the reliability of communication policies. The central bank's implementation of a predictable and consistent communication strategy will stabilize both the confidence index and capacity utilization.

Based on the findings, the following recommendations can be developed to increase the effectiveness of monetary policy in the Turkish economy and strengthen predictability in the

real sector:

- Expectation Management and Transparent Communication: Market guidance and forward guidance should be strengthened prior to monetary policy decisions. Transparency has a direct impact on real sector confidence.
- Real Sector Supportive Investment Policies: To mitigate the negative short-run effects of interest rate hikes on production, policy measures that support firms' access to finance and help sustain capacity utilization during tightening episodes should be considered.
- Monetary-Fiscal Coordination: A balance should be established between monetary and fiscal policies. The price stability target should be supported by production and employment-friendly fiscal policies (OECD, 2025; IMF, 2024).
- Data-Driven Early Warning Systems: SVAR-like early warning systems should be established for leading indicators such as real sector confidence, capacity utilization, and foreign trade; policymakers should make proactive decisions based on these systems.
- Enhancing External Trade Resilience: Export financing, foreign exchange risk management, and insurance mechanisms should be strengthened to reduce the sensitivity of external trade to interest rate shocks.

In conclusion, this study comprehensively assesses the effects of monetary policy on the real economy in terms of both expectations and production channels; it demonstrates the existence of strong short-term effects but limited long-term effects. For sustainable macroeconomic balance in the Turkish economy, monetary policy must be conducted within a confidence-focused, data-driven, and coordinated framework.

References

Akkaya, M. (2022). Analysis of the factors affecting real sector confidence: Evidence from Turkey. *Anadolu University Journal of Social Sciences, 23*(2), 463-480.

Aktepe, C., & Yumuş, F. (2023). The relationship between capacity utilization rate and export value in the manufacturing industry: Evidence from Turkey. *Journal of Business Research-Turk, 15*(4), 3113-3120.

Alagöz, G. Ç. M. (2024). An econometric analysis of the relationship between real sector confidence index and stock returns. *International Journal of Disciplines in Economics & Administrative Sciences Studies, 6*(24), 957-972.

Albayrak, Ş. G. (2018). An empirical study on the relationship between real sector confidence index and capacity utilization rate in Turkish manufacturing industry (2007-2017). *Journal of Academy of Social Sciences, 5*(15), 18-27.

Alif, P. F. K., Ajija, S. R., Fitriyana, Z., & Setyorini, W. (2025). How the consumer confidence index

affects credit growth in Indonesia? *Jurnal Ilmu Ekonomi Terapan, 10*(1), 193-210.

Arısoy, İ. (2012). The relationship between economic confidence indices and selected macroeconomic variables in the Turkish economy: A VAR analysis. *Journal of Finance (Maliye Dergisi), 162*, 304-315.

Bernanke, B. S., & Blinder, A. S. (1992). The federal funds rate and the channels of monetary transmission. *American Economic Review, 82*(4), 901-921.

Bicil, İ., & Başarır, Y. (2022). Symmetric and asymmetric relationship between real sector confidence index and industrial production index. *BILTURK Journal of Economics and Related Studies, 4*(1), 46-58.

Blanchard, O. J., & Quah, D. (1989). The dynamic effects of aggregate demand and supply disturbances. *American Economic Review, 79*(4), 655-673.

Christiano, L. J., Eichenbaum, M., & Evans, C. L. (1999). Monetary policy shocks: What have we learned and to what end? In J. B. Taylor & M. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1A, pp. 65-148). Amsterdam: Elsevier.

Clarida, R., Galí, J., & Gertler, M. (1999). The science of monetary policy: A New Keynesian perspective. *Journal of Economic Literature, 37*(4), 1661-1707.

Coccia, M., & Russo, M. (2025). Monetary policy, structural changes and economic growth: A dynamic framework. *Structural Change and Economic Dynamics, 72*, 102493. https://doi.org/10.1016/j.strueco.2025.102493

Daver, G. (2023). The relationship between bank loans and capacity utilization rate in the manufacturing industry: Interaction of economic activity. *Istanbul Gelisim University Journal of Social Sciences, 10*(2), 533-554.

Demir, C., & Özcan, S. E. (2023). Asymmetric relationship between industrial production, capacity utilization rate, and producer prices in Turkey: A nonlinear ARDL approach. *Journal of Economic Policy Researches, 10*(2), 525-543.

Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy, 84*(6), 1161-1176.

Durgun, A. (2019). The relationship between consumer and real sector confidence indices and selected macroeconomic variables in Turkey (2010-2018). *Journal of Management and Economics Research, 17*(1), 314-332.

Friedman, M. (1968). The role of monetary policy. *American Economic Review, 58*(1), 1-17.

Galí, J. (2015). *Monetary policy, inflation, and the business cycle* (2nd ed.). Princeton, NJ: Princeton University Press.

Gong, X. (2024). The impacts of financial market, trade and economic shocks. *Journal of Economic Integration, 39*(1), 93-120. https://doi.org/10.11130/jei.2024.39.1.93

Hardi, I., Ali, N., Duwal, N., Devi, N. C., Mardayanti, U., & Idroes, G. M. (2024). Business confidence in Indonesia: Which macroeconomic factors have long-term impact? *Indatu Journal of Management and Accounting, 2*(1), 40-54.

International Monetary Fund (IMF). (2024). *Monetary policy and real sector dynamics in emerging economies.* Washington, DC: IMF.

Kilian, L., & Lütkepohl, H. (2017). *Structural vector autoregressive analysis.* Cambridge: Cambridge University Press.

Kim, S., & Roubini, N. (2000). Exchange rate anomalies in the industrial countries: A solution with a structural VAR approach. *Journal of Monetary Economics, 45*(3), 561-586.

Koç, E., Kaya, K., & Şenel, M. C. (2017). Industrial indicators and economic confidence in the Turkish manufacturing sector. *Engineer and Machinery (Mühendis ve Makina), 58*(688), 15-37.

Levrero, E. S. (2021). Interest rates and monetary policy: A critical assessment of New Keynesian and post-Keynesian approaches. *Review of Political Economy, 33*(5), 691-713.

Marques, G. D. O. L. C., & de Freitas Pinto, M. G. (2024). Dynamics of persistence in Brazilian economic uncertainty, expectation, and confidence indexes. *Finance Research Letters, 70*, 106270.

Mishkin, F. S. (1995). Symposium on the monetary transmission mechanism. *Journal of Economic Perspectives, 9*(4), 3-10.

Organisation for Economic Co-operation and Development (OECD). (2025). *Economic outlook 2025: Policy coordination and structural resilience.* Paris: OECD Publishing.

Peersman, G., & Smets, F. (2003). The monetary transmission mechanism in the euro area: Evidence from VAR analysis. *Cambridge University Press, 36*(2), 7-34.

Petersen, J. H. (2015). Business confidence and macroeconomic dynamics: Evidence from OECD economies. *Economic Modelling, 51*, 310-322.

Salihoğlu, E. (2023). The effects of real sector confidence index and banking sector on letter of credit as a payment method in international trade: The case of Turkey. *International Journal of Current Social Science, 2*(1), 1-9.

Sims, C. A. (1980). Macroeconomics and reality. *Econometrica, 48*(1), 1-48.

Suhányiová, A., Suhányi, L., & Kočišová, M. (2023). Business confidence in the sustainable manufacturing sector in the context of production, production prices, and interest rates. *Sustainability, 16*(1), 173.

Tita, A. F., French, J. J., Gurdgiev, C., & Obalade, A. (2025). Does the tail of finance wag the dog of the real economy? Dynamic connectedness of the stock market and business confidence. *International Review of Economics & Finance, 98*, 103856.

Yıldız, B. (2023). Investigating the relationship between financial development and real sector confidence index in Turkey using ARDL bounds test and Toda-Yamamoto causality analysis. *International Journal of Academic Accumulation, 6*(2), 219-235.