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Does monetary policy affect automotive demand? An empirical example from Turkey

Para Politikası Otomotiv Talebini Etkiliyor Mu? Türkiye'den Ampirik Bir Örnek

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ÖZ

Otomotiv sektörü gerek tüketici harcamalarının önemli bir bileşeni olması gerekse birçok tedarikçi sektörün temel alıcısı olması ile ekonomik büyümeye kayda değer bir katkı sağlamaktadır. Bu katkının fazla olduğu ülkelerden biri olan Türkiye'de ekonomik birimlerin otomotiv talebinde özellikle son dönemlerde artan bir şekilde servet tutma ve spekülasyon güdüsünün de etkili olduğu düşünülmektedir. Bunun yanı sıra, para politikasının enflasyonu kontrol etmeye yönelik uygulamalarının da dolaylı olarak otomotiv sektörünün performansına etki etmesi beklenmektedir. Sanayileşmiş ülkelerde para politikasının otomotiv talebi üzerindeki etkilerini inceleyen oldukça fazla çalışma bulunmaktadır. Öte yandan hem önemli otomotiv üreticisi olan hem de özellikle son yıllarda yüksek enflasyonla mücadele eden gelişmekte olan ülkelerde bu tarz çalışmalar oldukça sınırlıdır. Literatürdeki bu eksikliğin giderilmesine katkıda bulunmayı hedefleyen bu çalışmanın temel amacı, Türkiye'de para politikası kararları ile yurtiçi otomotiv talebinin ilişkili olup olmadığının araştırılmasıdır. Türkiye'de para politikasının yurtiçi otomotiv satışlarına etkisi Autoregressive Distributed Lag (ARDL) modeli ile test edilmiştir. Ocak 2011 ile Aralık 2023 dönemini kapsayan çalışmada para politikası değişkeni olarak ağırlıklı ortalama fonlama maliyeti (AOFM) incelenmiştir. Çalışmanın bulguları, AOFM'nin hem kısa dönemde hem de uzun dönemde yurtiçi otomotiv satışlarına doğrudan etkisinin olduğu yönündedir. Buna ek olarak sıkı para politikasının hem uzun dönem hem de kısa dönemde otomotiv satışlarını azalttığı sonucuna varılmıştır. Bu sonuçlar, politika yapıcılar ve reel sektör açısından otomotiv sektörünün büyümesini sürdürmek ve desteklemek için para politikasının etkili bir araç olduğu önerisini desteklemektedir.

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ABSTRACT

The automotive sector makes a significant contribution to economic growth both as an important component of consumer spending and as the main buyer of many supplier sectors. In Turkey, which is one of the countries where this contribution is high, it is thought that the motive of holding wealth and speculation is also effective in the automotive demand of economic agents, especially in recent years. In addition, monetary policy actions to control inflation are also expected to indirectly affect the performance of the automotive sector. There is a substantial literature examining the effects of monetary policy on the automotive demand in industrialized countries. Nevertheless, such studies are quite scarce in emerging countries that are both important automotive producers and have been struggling with high inflation especially in recent years. To fill this gap in the literature, the main objective of this study is to investigate whether monetary policy decisions and domestic automotive demand are related or not in Turkey. The effect of monetary policy on domestic automotive sales in Turkey is tested with the Autoregressive Distributed Lag (ARDL) model. Covering the period of January 2011- December 2023, the study analyzes the weighted average funding cost (WAFC) as a monetary policy variable. The findings of the study suggest that WAFC has a direct effect on domestic automotive sales both in the short run and in the long run. In addition, it was concluded that tight monetary policy reduced automotive sales both in the long run and in the short run. These results support the proposition that monetary policy is an effective tool for policymakers and the real sector to sustain and support the growth of the automotive sector.

1. Introduction

The automobile industry is one of the key sectors contributing to economic growth for various reasons. First, the industry is not only an important component of consumer spending, but it is also a main buyer of many

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supplier sectors thanks to its backward and forward linkages. Secondly, the automobile industry is also one of the major investors in R&D and manufacturing. Automobile production and sales are likewise main contributors to tax revenues for governments globally, generating over 430 billion euros in 26 countries alone (OICA, 2024). Hence, the industry influencing the economy from both demand and supply sides, is one of the most important areas of impact regarding monetary and fiscal policies. Therefore, the governments and Central bankers have mostly been concerned about developments in the industry providing considerable insights associated with monetary policy implementations (Ballew et al., 1994).

Turkey has long been an integral part of world automotive industry value chain, with its total production capacity exceeding 2 million vehicles and creating employment for more than 500 thousand employees. The country has been ranked as 14th and 4th biggest producer, in the world and in European Union respectively. According to Turkish Exporters Assembly, motor vehicle exports ranked first in the sectoral export rankings of Turkey for the last 16 consecutive years in 2023, with a share of 16 percent ($35 billion value) (OSD, 2024). Turkey exported approximately 70 percent of its automobile production to European market in 2021. As a member of the Customs Union with European Union, Turkey hosts several production bases of foreign manufacturers from Europe, the U.S., Japan, and South Korea (Nikkei Asia, 2022).

Global supply chain disruptions led by both Covid-19 pandemic and chip shortages, exacerbated by port congestions and they had a considerable combined effect on rising inflation all over the world. The logistics of producer companies were once disrupted by factory shutdowns amid the first stage of pandemic. As the mobility restrictions were eased, increased demand for commodities exceeded supply and then transportation congestions put further pressure on world trade (Ramani et al., 2020; Narasimhan, 2021, Root, 2021; Andriantomanga et al., 2023).

The global inflation which was fairly stable during 2010s has risen to 4.7% in 2021 and finally made a peak with 8.7% in 2022 (Statista, 2024). To reduce inflation, major central banks implemented tight monetary policy and raised policy interest rates in most of the countries. As a result of these contractionary monetary policies, world inflation is estimated to be around 6.8% in 2023 (IMF, 2024).

Theoretically, from the demand side, if the price of a commodity is estimated to rise in the future, actual demand for this commodity rises and the demand curve shifts to the right. From the supply side, an increase in the price of factor of production or in transportation costs dampen supply and shift the supply curve to the left. Consequently, coexistence of a decrease in supply and a rise in demand raises the consumer prices further (Pindick & Rubinfeld, 2013; Parkin, 2022). In countries where the expected rise in consumer prices is relatively high, the impact of inflation is becoming even more significant.

Turkey's annual inflation rate averaged 35% for the period 1965-2024. However, following the recent supply shocks, volatility in energy prices, continual changes in the setting of monetary policy (World Bank, 2022) and demand inflation during and after Covid-19 pandemic, this rate has risen to 64.8% in December 2023 compared to previous year. It was the highest level since November 2022 (Trading Economics, 2024). In other words, both cost-push and demand-pull factors and uncertainty triggered the rise in inflation in Turkey for the period 2022 and 2023 (Biçen, 2022).

A substantial body of literature indicate that high rates of inflation might have adverse influences on real economic growth as well as on several economic activities (Ashraf et al., 2013; Chifurira et al., 2014; Ding et al. 2021; Uddin & Anika, 2024). According to World Bank, it is estimated that the number of poor citizens increases by 2 percent due to a 1 percent increase in consumer prices in Turkey (World Bank, 2022). Therefore, in most countries, policymakers target primarily to achieve and maintain price stability and keep inflation under control because rising prices destroy the value of money as an exchange medium and a store of value. To this end, mainstream policy of Central Banks is to perform contractionary policy which can be characterized by rising interest rates to decrease the general price level through dampening the components of aggregate demand including investment and consumption (Blanchard, 2015).

Accordingly, the US Federal Reserve and developing countries have risen their policy rates since the beginning of 2022 to tighten their monetary policy. Unlike this policy, Turkey has intensified monetary easing by decreasing the policy rate by taking the risk of instability of increased exchange rate (Orhangazi & Yeldan, 2023). Although the Central Bank of the Republic of Turkey (CBRT) implemented unorthodox monetary policy and decrease interest rates during post-pandemic period, the Bank returned to Orthodox monetary policy and started to increase policy rates from June 2023 and beyond (BBC, 2023).

From households' perspective, Turkish consumers had to take several measures in order to protect the value of their assets and not to be affected by future increases to deal with higher inflation levels. Sales of durable goods including vehicles, consumer electronics, furniture and even home appliances have considerably risen in 2022 and 2023. This situation was similar to the "panic buying" experienced in some other developing countries such as Jordan (Al-Kofahi et al., 2024)

In case of automobile industry, associated with the magnifying impact of postponed demand resulting from supply-side disruptions faced during pandemic period, automobile sales in Turkey have risen significantly in 2022 and 2023. Both high inflation and the expectation that automotive prices will increase in the future raise the question of whether the automobile is treated by consumers as a financial asset in Turkey. If automotive demand acts like a financial asset, automotive demand and monetary policy

should be related. Accordingly, various studies delved into the macroeconomic literature to study the impact of monetary policy actions on car sales especially in developed countries. However, few studies have focused on emerging economies with high inflation. To fill this gap, this study aims to examine the relationship between the monetary policy decisions and automotive sales in Turkey from January 2011 to December 2023. In this study, monetary policy and automotive sales are investigated with the ARDL model bounds test approach. For this purpose, the long-run and short-run relationship between automotive sales and inflation rate, income level, exchange rate and monetary policy is investigated. Within these aims, the study has been structured as follows: literature review is included in section two followed by the underlying research methodology and data in section three. Then, section four put forth the empirical findings of the analysis. Finally, in the last section of the paper, policy implications, and suggestions for future studies are discussed.

2. Literature Review

There is substantial literature investigating the effects of monetary policy actions measured by various macroeconomic indicators on car sales. For instance, Bach et al. (2017) used monetary base, money supply, the GDP, net public sector debt, interest rate, Brazilian currency exchange rate, inflation rate, reserve requirements, open market operations, and the unemployment rate for measuring monetary policy actions. As per the analysis, they found that the automobile sector's performance which is represented by car manufacturing and export levels, is connected to monetary policy parameters in Brazil for the period from 1994 to 2014. Similarly, Fernandes et al. (2020), using Vector Auto Regressive with a Vector Error Correction model, analyzed the impact of monetary policy transmission mechanism on automobile sales in Brazil, from January 1995 to December 2014, after the real plan. The results showed that monetary policy actions have an effect car sale in Brazil. Likewise,

Johan (2020) examined the parameters affecting car sales in five ASEAN countries, namely Indonesia, Thailand, Malaysia, Singapore, and Vietnam from 2005 to 2016 through multilinear regression method. His study showed that car sales were significantly influenced by the previous period inflation, GDP per capita, interest rate and the foreign exchange rate.

Kaya et al. (2019), using Artificial Neural Network, ARIMA, and time series methods, aimed to investigate the determinants affecting car sales in Turkey and explored that the impact of dollar exchange rate, the expectation of financial status of households, industrial production index, and the logarithmic form of car sales of previous month were significant on auto sales.

Monetary policy decisions of Central Banks affect the economy through several transmission channels such as interest rates, exchange rates, asset prices, credit, and expectations. By altering these variables, the decisions of monetary policy makers influence the levels of savings, investment, as well as household and firm expenditures, which in turn affect aggregate demand and finally, the inflation rate (ECB, 2024).

The Central Bank of the Republic of Turkey (CBRT) meet the liquidity needs of the market with the policy interest rate and overnight lending interest rate it has determined. However, the costs of other liquidity instruments used by the CBRT, in addition to the policy rate, also become important when the bank provide liquidity to the market. The underlying reason for this is that the CBRT uses different rates and tools, not a single instrument, therefore the cost rate also has a varying nature. The average interest rate of various liquidity instruments used by the CBRT whilst funding the market is considered as the "Weighted average funding cost" (WAFC) (Ekinci et al., 2016).

According to CBRT, WAFC is the weighted average of the interest rates of the funding provided by the CBRT with several instruments in different terms (nightly, weekly, etc.) to meet the liquidity need in the market (CBRT, 2024). The CBRT has taken WAFC into account during the market funding phase as the base interest rate until the beginning of 2021. Starting from 2021, the Bank considers the policy interest rate it has determined as the weighted average funding cost (Güneş, 2022). Therefore, in our study we used the WAFC as the monetary policy instrument to measure the impact of monetary policy decisions on car sales.

Although studies have examined the relationship between monetary policy and the automotive sector, they have not addressed the issue of whether automotive demand is directly affected by monetary policy or not. While some studies examine the relationship between market interest rates (e.g. loan rates) and automotive exports (Bach et al., 2017) other studies investigate the relationship between credit volume and the automotive sector (Özçelebi & Şafak, 2018). This study investigates whether the automotive as a financial asset is affected or not by the monetary policy actions in Turkey. The findings are expected to provide a clearer understanding of the impact of monetary policy on the real sector.

3. Methodology and Data

In this study, whether there is a relationship between monetary policy and automotive demand in Turkey is tested with Autoregressive Distributed Lag Model (ARDL). The ARDL model proposed by Peseran and Shin (1999) and Peseran et al. (2001) combines both short-run and long-run dynamics between the dependent variable and independent variables in the same model. Unlike other cointegration tests in the literature, the ARDL approach does not take into account that the stationarity level of the variables is the same. Therefore, this approach avoids the problems caused by non-stationary series (Esen & Ozata, 2017:48).

To examine the short and long run relationships between the

variables, the following equation developed by Peseran and Shin (1999) is estimated by OLS method (Mert and Caglar, 2019: 279-297):

$$a_t = \delta_0 + \sum_{i=1}^{p} \psi_i \, a_{t-i} + \sum_{j=1}^{k} \sum_{l_j=1}^{q_j} \beta_{j,l_j} \, x_{j,t-l_j} + \varepsilon_t$$

In the above equation, δ_0 is the constant term, ψ_i is the trend coefficient, $\beta_{j,l\ j}$ is the coefficient of lagged values of the dependent variable, ψ_i is the coefficient of independent variables and ε_t is the error term. The appropriate lag length of the model is selected according to Akaike, Schwarz, Hannan Quin information criteria. Without using the deterministic terms of the above equation, the cointegration relationship can be examined by estimating the model developed by Peseran et al. (2001) below:

$$a_t = \delta_0 + b_0 a_{t-1} + \sum_{j=1}^{k} b_j \, x_{j,t-1} + \sum_{i=1}^{p-1} z_{0,i} \, \Delta y_{t-i} + \sum_{j=1}^{k} \sum_{l_j}^{q_{j-1}} z_j l_j \, \Delta x_{j_t,t-l_j} + \sum_{j=1}^{k} d_j \, \Delta x_{j,t} + \varepsilon_t$$

The term Δ represents the difference operator and reflects the short-run dynamics of the equilibrium. Whether there is a long-run relationship between the variables is decided by testing the hypothesis H_0: $b_0=b_j=0$. The null hypothesis is tested by calculating the F test statistic developed by Peseran et al. (2001). If the calculated test statistic is less than the lower bound, the null hypothesis is accepted, and it is concluded that there is no cointegration relationship between the variables. If the test statistic is greater than the upper bound, the null hypothesis is rejected, and it is concluded that there is a long-run relationship between the variables.

The error correction equation of the model derived from the above equation is as follows:

$$EC_t = a_t - \sum_{j=1}^{k} \frac{b_j}{b_0} x_{j,t}$$

Based on this, the following model is estimated to investigate the relationship between automobile sales and monetary policy in Turkey:

$$\begin{aligned} \Delta CAR_t = \delta_0 &+ \sum_{i=1}^{m} \delta_1 \, \Delta CAR_{t-i} + \sum_{i=1}^{m} \delta_2 \, \Delta WAFC_{t-i} \\ &+ \sum_{i=1}^{m} \delta_3 \, \Delta CPI_{t-i} + \sum_{i=1}^{m} \delta_4 \, \Delta SAN_{t-i} \\ &+ \sum_{i=1}^{m} \delta_5 \, \Delta RER_{t-i} + b_1 CAR_{t-i} + b_2 AOFM_{t-i} \\ &+ b_3 CPI_{t-i} + b_4 SAN_{t-i} + b_5 RER_{t-i} \\ &+ b_6 dummy_{t-i} + \varepsilon_t \end{aligned}$$

In the above model, δ_0 stands for the constant term, δ_i stands for the short-run coefficients, b_i stands for the long-run coefficients and ε_t stands for the error term. CAR variable is the monthly automobile sales in Turkey, WAFC is the weighted average cost of funding representing monetary policy, CPI is the monthly consumer price index, SAN is the industrial production index representing income and RER is the real effective exchange rate. The model is estimated using the natural logarithms of all variables except WAFC. The model covers the period from January 2011 to December 2023, when the Central Bank of the Republic of Turkey started to implement the new monetary pooling framework. During this period, a dummy variable is used in the model where the dates of the Covid-19 pandemic take the value 1 and the other dates take the value zero. The Table 1 presents descriptive statistic for the variables used in the model.

Table 1. Descrpitive Statistic

	LNCAR	WAFC	LNCPI	LNRER	LNSAN
Mean	11.056	11.899	5.911	4.416	4.675
Median	11.084	9.530	5.737	4.508	4.677
Maximum	11.958	41.090	7.499	4.752	5.109
Minimum	9.573	4.520	5.207	3.864	4.227
Std. Dev.	0.420	6.098	0.582	0.2598	0.205
Skewness	-0.715	1.676	1.044	-0.478	0.034
Kurtosis	3.882	6.518	3.244	1.785	2.137
Jarque-Bera	18.260	152.562	28.584	15.445	4.834
Probability of Jarque-Bera	0.000	0.000	0.000	0.000	0.089
Sum	1713.749	1844.35	916.259	684.528	724.641
Sum Sq. Dev.	27.212	5727.917	52.189	10.399	6.490
Observations	155	155	155	155	155

4. Emprical Findings

The first step in time series analysis is to determine whether the variables have a unit root. The table below shows the Phillips-Perron (PP) test statistic results of the series in the model. We utilized the PP test as a unit root test in our study to assess the stationarity properties of the time series data under investigation. The choice of the PP test was motivated by its robustness and suitability for small sample sizes, which are common in econometric studies. Moreover, the PP test allows for the consideration of both deterministic and stochastic trends in the data, providing a comprehensive

analysis of the stationarity properties essential for reliable econometric modeling and inference. Overall, the selection of the PP test was based on its methodological rigor and its ability to provide meaningful insights into the time series properties of the data.

Table 2. PP Unit Root Test Results

Variable	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LNCAR	0.0000***	0.0000***	-	-
WAFC	0.8390	0.6550	0.0000***	0.0000***
LNCPI	1	1	0.0000*	0.0000***
LNSAN	0.0267***	0.0000***	-	-
LNRER	0.9184	0.2817	0.0000***	0.0000***

Note:* and *** indicate that the probability value of the test statistic is less than 5 percent and less than 1 percent, respectively.

According to the PP unit root test results given in the table, while the LNCAR variable does not contain a unit root at the level, the other variables become stationary when the first difference is taken. While the LNSAN variable contains a unit root in the case of constant, it is stationary in the case of trend and constant. Since none of the variables are stationary when the second difference is taken and the variables in the model exhibit different orders of stationarity, it seems possible to estimate the ARDL model.

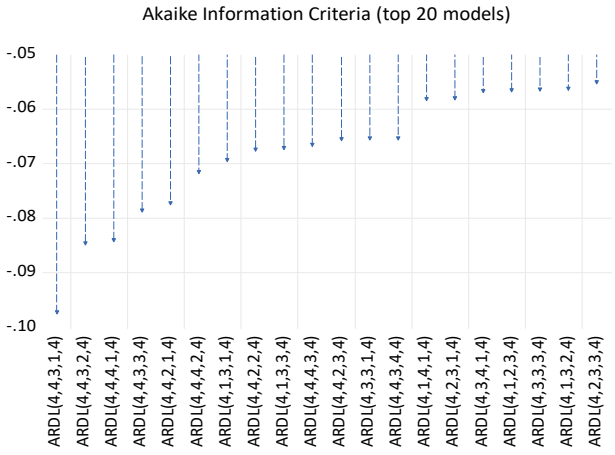


Figure 1. Akaike Information Criteria

As shown in Figure 1, the appropriate model is identified as ARDL (4,4,3,1,4) using the Akaike information criterion (AIC). Accordingly, the fourth lag of the dependent variable, LNSAN and WAFC variables are included in the model, while the first lag of LNRER and the third lag of LNCPI are included in the model.

The results of cointegration test to investigate the relationship between monetary policy and domestic automotive demand are given in the table below.

Table 3. Cointegration Test Results

Calculated test statistic: 11,44787	Critical Value	
	Lower bound *I*(0)	Upper Bond *I (1)*
1% significance level	3.29	4.37
5% significance level	2.56	3.49
10% significance level	2.2	3.09

Since the calculated test statistic is greater than the upper critical values, the null hypothesis that there is no long run cointegration relationship between the variables is rejected. After determining the cointegration relationship between the variables, the long-run coefficients of the model are determined and presented in Table 3.

Table 4. Long-Run Coefficient of The Model

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
WAFC	-0.027	0.008	-3.285	0.0013
LNCPI	1.003	0.252	3.972	0.0001
LNRER	3.100	0.650	4.763	0.0000
LNSAN	1.364	0.382	3.569	0.0005
C	-1.479	4.523	-3.271	0.0013

According to the information obtained from the long-run coefficients of the model, the coefficient of the LSAN variable included in the model representing income is positive and statistically significant. In the long run, an increase of 1% in the industrial production index rises automotive sales by approximately 1.3%. The coefficient of the LNRER variable representing the real effective exchange rate is also positive and statistically significant. Accordingly, an increase/appreciation of 1% in the real exchange rate/domestic currency increases automotive sales by approximately 3.1%. On the other hand, the coefficient of the LNCPI variable added to the model to represent inflation is positive and statistically significant. The increase in automotive sales when inflation increases is an indication

that the demand for automobiles in Turkey is driven by wealth preservation and inflation hedging. It also reflects the indirect effect of monetary policy on automotive demand. According to the long-run coefficients obtained from the model, an increase of 1% in inflation rises automotive demand by approximately 1%.

The long-run coefficient of the WAFC variable included in the model representing monetary policy is statistically significant and negative. The empirical result suggests that an increase of 1% in interest rates correlates with a roughly 0.02% decline in automotive demand. This result shows that monetary policy decisions directly affect automotive demand in Turkey, albeit weakly.

After obtaining the long-run coefficients of the model, the short-run dynamics of the model is analyzed by calculating the coefficients of the error correction term. Table 4 shows the error correction equation obtained from the ARDL model.

Table 5. Eror Correction Equation

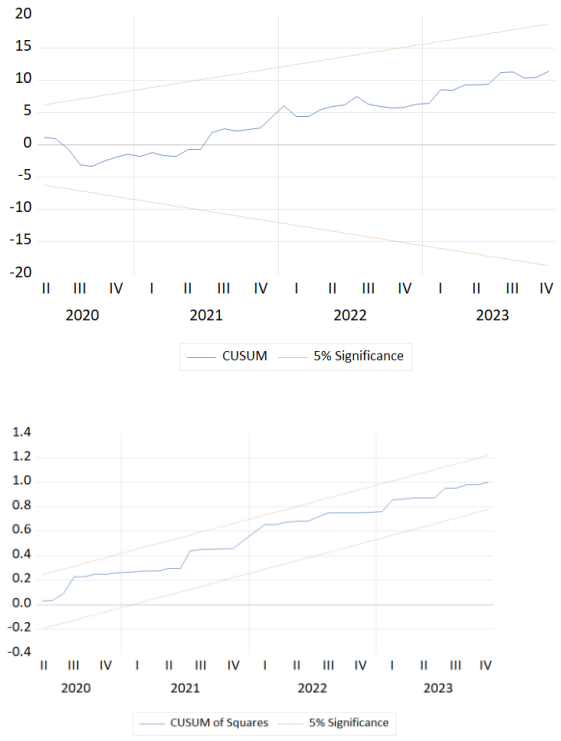
Dependent Variable: LNCAR				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
COINTEQ*	-0.732	0.086	-8.446	0.0000
D(LNCAR(-1))	-0.396	0.080	-4.932	0.0000
D(LNCAR(-2))	-0.414	0.075	-5.457	0.0000
D(LNCAR(-3))	-0.231	0.067	-3.428	0.0008
D(WAFC)	0.014	0.017	0.849	0.3973
D(WAFC(-1))	-0.011	0.017	-0.653	0.5146
D(WAFC(-2))	-0.033	0.018	-1.812	0.0721
D(WAFC(-3))	0.052	0.019	2.741	0.0070
D(LNCPI)	-1.841	1.388	-1.325	0.1872
D(LNCPI(-1))	2.854	1.722	1.657	0.0998
D(LNCPI(-2))	3.139	1.323	2.371	0.0191
D(LNRER)	0.038	0.587	0.065	0.9476
D(LNSAN)	2.522	0.193	1.301	0.0000
D(LNSAN(-1))	2.280	0.281	8.111	0.0000
D(LNSAN(-2))	2.005	0.316	6.331	0.0000
D(LNSAN(-3))	1.043	0.259	4.014	0.0001
DUMMY	0.325	0.066	4.925	0.0000

Note: The letter D at the beginning of the variable names represents the difference operator.

The fact that the error term coefficient lies between -1 and 0 and is statistically significant shows that the error correction model works. Accordingly, approximately 73% of the long-term deviations in automotive sales are corrected in the first period.

The figure below shows the results of the CUSUM and CUSUMQ tests, in which the stability of the model is tested. Since the test statistics fall between the critical values drawn at the 5% significance level, all coefficients of the error correction model are stable.

Figure 2. CUSUM and CUSUMQ Tests



5. Conclusion

From the aspect of monetary policymakers, the automotive sector is one of the key barometer sectors providing substantial insights associated with its overall micro and macro effects. This sector is interconnected its backward and forward linkages with many other sectors. Besides, the industry is also an important economic indicator as automobile demand reflects the impacts of cyclical adjustments and short-term developments of economy and. In addition, autos are one of the durable goods that economic agents resort to in order to avoid price increases particularly during inflationary periods.

General level of prices has risen in most of the countries due to the internal and external supply shocks with the intensive spread of Covid-19 globally, and thus contributed to inflationary economic pressures. Turkey was not an exception, and the country is one of the economies with highest inflation level during post-pandemic period specifically in 2022 and 2023. Besides, compared to other manufacturing countries, Turkey is an importer of energy and intermediate commodities. Thus, rising level of inflation resulted in a boost in durable goods, somehow similar to Jordan case as stated by Al-Kofahi et al. (2024).

In this study, we are testing whether the automotive sector sales in Turkey is affected by monetary policy. For this purpose, the relationship between domestic automotive sales and the real exchange rate, income, inflation rate and monetary policy variables is analyzed using the ARDL model bounds test approach. As a result of the ARDL

bounds test, a long-run relationship was found between automotive sales and the variables; consumer price index (LNCPI), industrial production index representing income (LNSAN), real effective exchange rate (LNRER) and weighted average cost of funding representing monetary policy WAFC. The fact that the variable representing monetary policy (WAFC) is negative and significant indicates that monetary policy decisions directly affect automotive demand. Accordingly, an expansionary (contractionary) monetary policy implementation results in an increase (decrease) in the automotive demand of economic agents. This is because, as we initially assumed, automobiles in Turkey are not only considered as a durable consumer good but also as a financial asset. Based on our findings, the monetary policy variables provide effects in car sales in Turkey. The results of the study are consistent with the studies of Bach et al. (2017), Fernandes et al. (2020), Johan et al. (2020).

The contribution of this study to the literature is that it uses the Central Bank interest rate instead of the market interest rate and money supply. The purpose of using the WAFC variable, which reflects the monetary policy stance, instead of the credit loan rates that directly reflects automotive demand, is to test whether monetary policy decisions signal economic agents whether to invest in automotive or not. The results obtained from the ARDL bounds test show that automotive demand works in Turkey in the same way as financial assets. On the other hand, the positive effect of inflation on automotive demand implies that automobiles are also demanded for wealth preservation in Turkey. Such a finding suggests that monetary policy also affects automotive demand indirectly through inflation.

The findings of the study have implications for both the automotive sector and public and private policymakers. These results enable the automotive sector to more accurately predict how the market will shape in the future by following the monetary policy stance. Identifying the impact of monetary policy on the automotive sector provides a clearer understanding of the impact of monetary policy on the real sector considering the linkages of the sector with its interrelated industries. Thus, policymakers can more clearly identify the overall impact of their decisions when designing their monetary policy actions.

According to findings, the monetary policy actions have a significant effect on Turkey's automotive demand both in the short run and in the long run. For instance, it was concluded that contractionary monetary policy reduced automotive sales both in the long run and in the short run, confirming the impact of macroeconomic policies on aggregates demand. At this stage, another important point is that automotive industry has a multiplier effect thanks to its above-mentioned linkages. In this context, the reflections of the designed policies may emerge even stronger depending on the multiplier effect. These results support the proposition that monetary policy is an effective tool for policymakers and the real sector to sustain and support the growth of the automotive sector.

The paper has several limitations. It is limited to WAFC as monetary policy mechanisms variable on car sales in Turkey and it is not considering other endogenous or exogenous variables, or fiscal policy measures. Thus, future studies may take into account other variables of monetary and fiscal policies for different countries as well as for different periods. In this regard, this study can be expanded to comparative analysis of developing countries with high inflation on a larger scale. In addition, it may provide insights for future studies to examine the effects of monetary and fiscal policy mechanisms on vehicle sales jointly.

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