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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

THE CAUSALITY BETWEEN THE EXCHANGE RATE AND HEALTH PRICE INDEX: AN ECONOMETRIC ANALYSIS

DÖVİZ KURU İLE SAĞLIK FİYAT ENDEKSİ ARASINDAKİ NEDENSELLİK: EKONOMETRİK BİR ANALİZ

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ABSTRACT

Following the COVID-19 pandemic, there have been significant increases in the prices of health-related goods and services worldwide. In Turkey, the growth rate of the Health Consumer Price Index (HCPI) has been particularly high. For instance, while the health price index was only 112 in January 2006, it rose to 150 in January 2015. Before the pandemic, the HCPI was calculated as 236 in January 2019; however, in the post-pandemic period, it skyrocketed to 718.3 in January 2023, reaching approximately 900 by July, and exceeding 1500 as of November 2024. This article aims to examine the causality relationship between the health price index and the nominal exchange rate index in Turkey using the Toda-Yamamoto time series analysis. The dataset, which focuses on the relationship between changes in the nominal exchange rate and the health price index from the perspective of the Turkish economy, includes the nominal exchange rate (in US dollars) and the domestic health consumer price index (2003=100). The data, spanning from January 2006 to October 2024, were obtained from the Electronic Data Distribution System of the Central Bank of the Republic of Turkey (CBRT). The analysis was conducted using the E-Views 9.0 software package. According to the results of the Toda-Yamamoto analysis, a causality was found running from the nominal exchange rate (NER) to the health consumer price index (HCPI).

Keywords: Health, Health Price, Inflation, Exchange Rate, Toda Yamamato

ÖZET

COVID-19 pandemisinin ardından, dünya genelinde sağlıkla ilgili mal ve hizmetlerin fiyatlarında önemli artışlar yaşanmıştır. Türkiye'de, Sağlık Tüketici Fiyat Endeksi (STFE) artış oranı özellikle yüksektir. Örneğin, Ocak 2006'da sağlık fiyat endeksi sadece 112 iken, Ocak 2015'te 150'ye yükselmiştir. Pandemi öncesi, Ocak 2019'da 236 olarak hesaplanan STFE, pandemi sonrası dönemde, Ocak 2023'te 718,3'e fırlamış, Temmuz ayı itibariyle yaklaşık 900'e ulaşmış, 2024 Kasım itibariyle ise 1500 üzerindedir. Bu makale, Türkiye için sağlık fiyat endeksi ile nominal döviz kuru endeksi arasındaki nedensellik ilişkisini Toda Yamamoto zaman serileri analizini kullanarak incelemeyi

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amaçlamaktadır.Türk ekonomisi açısından nominal döviz kuru değişiklikleri ile sağlık fiyat endeksi arasındaki ilişkiyi inceleyen veri seti, nominal döviz kuru (dolar cinsinden) ve yurtiçi sağlık tüketici fiyat endeksini (2003=100) içermektedir. 2006:01-2024:10 arasında olan veriler, Türkiye Cumhuriyet Merkez Bankası (TCMB) elektronik veri dağıtım sisteminden alınmıştır. Analizde E-views 9.0 paket programı kullanılmıştır. Toda-Yamamoto analizi sonuçlarına göre, (NDK) Nominal Döviz Kuru'ndan (STFE) Sağlık Tüketici Fiyat Endeksi'ne doğru bir nedensellik olduğu bulunmuştur.

Anahtar Kelimeler: Sağlık, Sağlık Fiyatı, Enflasyon, Döviz Kuru, Toda Yamamato

1. INTRODUCTION

Inflation has a significant place in the economic literature. It is a concept frequently examined by economists due to its relationship with many macroeconomic variables it affects and is affected by. Throughout history, various definitions of inflation, which have been accepted in the literature, have been made by analyzing its relationship with many macroeconomic variables in different periods. In its most general definition, Inflation refers to the sustained rise in the prices of goods and services that consumers buy. There are two important points to consider when defining inflation. The first of these points is the general price level, and the second is the concept of continuity (Barca, 2022).

Throughout their history, many emerging markets and developing nations have faced moderate to high levels of inflation. This inflation began to climb in the 1950s, accelerated dramatically during the 1970s and early 1980s, and culminated in hyperinflations in the late 1980s and early 1990s. By the second half of the 1990s, the majority of these countries succeeded in reducing their inflation rates, maintaining this reduced inflation at the onset of the 21st century. However, starting in the mid-2000s, inflationary pressures resurfaced, primarily driven by rising food and energy prices. By the mid-1990s, inflation had been brought down to double-digit levels, and by 2000, it had reached single-digit levels. The disinflation success of the 1990s is often attributed to fiscal consolidation. Additionally, external factors such as falling global inflation and oil prices, along with institutional reforms like increased central bank independence, Improved access to global capital markets, along with structural reforms in product, trade, and labor sectors, played significant roles in supporting lower inflation rates (International Monetary Form, 2008; Asfuroğlu, 2021). In countries with a high dependency on imported goods and inputs, the impact of exchange rate-induced inflation is significantly noticeable. Similarly, in economies where production structures are heavily reliant on imported goods, the influence of the exchange rate on inflation manifests as both price and cost inflation. Cost inflation, which arises from the effect of exchange rates on costs, is particularly pronounced in economies with a high proportion of imported inputs (Ünsal et al., 2021). The relationship between inflation and exchange rates, known in the literature as the pass-through effect or exchange rate pass-through, was first explained by Dornbusch. The pass-through effect refers to the impact that a change in the exchange rate has on inflation. According to Dornbusch, when wages are indexed to the exchange rate, nominal wages will rise, leading to an increase in inflation through higher production costs (Dornbusch, 1985). In the Turkish economy, service sectors that hold significant importance, such as tourism, transportation, and health, can be affected by fluctuations in the exchange rate (Pekmezci & Bozkurt, 2016). Therefore, analyzing how exchange rates influence inflation is a vital aspect of economic research in Turkey (Özer et al., 2022).

Healthcare costs and expenditures are increasingly becoming a critical issue for households and governments globally. Driven by factors such as an aging population, the spread of

advanced technologies, growing healthcare demand, rising public expectations, and evolving disease patterns, nations are facing the challenge of a rapid surge in healthcare spending. In their efforts to achieve universal health coverage—ensuring affordable, equitable, and high-quality healthcare without imposing financial strain—countries are not only allocating greater resources to their health systems but also focusing on improving efficiency. Without successfully controlling the inflation of healthcare expenditures, the long-term sustainability of these systems could be at serious risk (Özer et al., 2022). Although there has been considerable research on the trends and determinants of healthcare expenditures in the literature (Xu, 2011; Akca et al., 2017) the number of studies focusing on the health price index is quite limited. Percentage increase in the Consumer Price Index of Health is called health inflation. Health policymakers often mistakenly equate the health inflation rate with health expenditures. However, health expenditures refer to the total spending on healthcare, encompassing both the volume and cost of services, alongside the combined contributions of public and private sectors. These expenditures also include the costs associated with healthcare delivery, nutrition programs, family planning services, and emergency medical aid. As such, health inflation is a distinct concept and should not be confused with the increase in overall health expenditures (Özer et al., 2022). Following the COVID-19 pandemic, there have been significant increases in the prices of goods and services related to healthcare in countries worldwide. In countries like Turkey, this rate of increase is particularly high. For example, while the health price index was only 112 in January 2006, it had risen to only 150 by January 2015. Before the pandemic, in January 2019, it was calculated at 236. However, in January 2023, during the post-pandemic period, the same index soared to 718.3 and by July, it reached approximately 900 and the index is more than 1500 at December 2024 (Turkish Statistical Institute, 2024).

This paper aims to examine the causal relationship between the health price index and the real exchange rate index for Turkey using the Toda-Yamamoto time series analysis. Our study is unique in that it analyzes both the healthcare price index and changes in healthcare prices after the COVID-19. We believe that the findings and policy suggestions of this study will be particularly significant for developing countries like Turkey, which rely heavily on external sources for health products. The aim of this study is to understand the impact of exchange rate fluctuations on healthcare prices and to provide important data that can shape health policies. The importance of the study lies in the detailed examination of the interactions between the exchange rate and the healthcare price index, thus contributing to health policies.

The article consists of the following sections: First, the current information on the subject will be presented through a literature review, then the analysis techniques used in the method section will be detailed. The results section follows, where the analysis findings are presented. Finally, in the conclusion section, the research findings will be discussed.

2. LITERATURE REVIEW

This section presents a review of studies from the literature examining the relationships between fluctuations in exchange rates, inflation, and consumer price indices across various sectors and their impact on the health sector. The results of the literature review indicate that there is a paucity of studies examining the relationship between exchange rates and health price indices. It is anticipated that this study will contribute to the filling of this gap in the existing literature. In this context, the results of the studies conducted provide an important

perspective for developing a deeper understanding of the topic. The study, conducted by Celkan (2023), aimed to investigate the effects of exchange rates on domestic markets and inflation in Turkey. It analyzed monthly data from 2013 to 2021 using time series and regression methods. The findings revealed that a 10% increase in exchange rates and prices led to a 1.92% average rise in domestic prices within the same month. This indicates that exchange rate fluctuations are reflected in domestic prices and have an impact on sector-specific prices. In another study examining the relationship between exchange rates, the industrial sector index, and service sector indexes in Turkey using the Granger causality test, monthly data for the period 1997-2004 were used for the service sector index, while monthly data for the period 1991-2004 were used for the other variables. The results of the study revealed that there was a stable relationship between the exchange rate and the industrial sector index in the long term, but no relationship was found between the exchange rate and the service sector index (Ayvaz, 2006).

In the study of Aytekin et al. (2023), which analyses the long and short-run relationships between exchange rate and inflation, the relationships between consumer price index, producer price index and real effective exchange rate were investigated by ARDL bounds test using monthly data between 2004-2021. As a result, it was determined that a 1% increase in producer prices in Turkey in the long run would lead to a 0.40% increase in inflation. The relationship between inflation and real effective exchange rate in the long run was found to be statistically insignificant. The Toda Yamomato test results for the causality relationship between these variables show that there is a bidirectional causality relationship between the exchange rate and producer prices, but there is a unidirectional causality relationship from producer prices to inflation.

In a study aiming to reveal the components affecting the increases in health expenditures and health inflation after the Health Transformation Programme (HTP) in Turkey and the impact of health inflation on general inflation, time series analyses were used on data between 2003-2017. According to the results of the analyses, a 1% increase in the inflation rates of medical products, outpatient services and inpatient services increased health inflation by approximately 0.9%, 0.8% and 0.3%, respectively. It is evident that the primary driver of health inflation over time is the rise in prices of medical products and outpatient services (Ankara & Zeybek, 2021).

During the pandemic period, in a study conducted to determine how exchange rates and gold prices, which are shown as the main causes of inflation, affected this increase, the consumer price index covering the period 2020:01-2023:01 was analysed by time series analysis. As a result, a unidirectional causality relationship was found from the Consumer Price Index (CPI), which is one of the determinants of inflation, to Gold Prices and Exchange Rate variables (Alazoğlu Coşğun, 2023).

In another study examining the causality relationship between the health care price index and the real effective exchange rate index in Turkey, the monthly data of the health care price index and the real effective exchange rate index for the period 2008M02-2020M07, base year 2003, were analysed with the Toda-Yamamoto (T-Y) causality test with structural breaks. As a result of the study, it is found that there is a causality from the real exchange rate index to the health services price index, and the real effective exchange rate temporarily causes the health services price index in the short and medium term. It was concluded that the effect of the real exchange rate index on the health price index lasted between 2 months and 8.37 months (Ozer et al., 2022).

In a research examining the relationship between health tourism revenues and the real exchange rate in Turkey, Johansen cointegration and Granger causality techniques were used with a quarterly data set for the period Q1 2002 - Q4 2019. As a result of the analysis, it is found that the real exchange rate affects health tourism revenues both in the short and long run. It is estimated that a 1% change in the real exchange rate based on all developed and developing trading partner countries will cause a change of 2.4065%, 2.6108% and 2.1383% in health tourism revenues in the opposite direction, respectively. These findings show that health tourism revenues are highly sensitive to changes in real exchange rates (Ağazade & Ergün, 2022).

With the aim of measuring the impact of the exchange rate on the healthcare CPI (and its components) in Colombia, a database of 131 monthly economic variables from January 2000 to December 2015 was analysed using the Factor-Augmented Vector Autoregressive (FAVAR) method. The Exchange Rate Pass-Through (ERPT) result for healthcare inflation was found to be lower (between 0.7 and 0.3) than the effect on the overall level of inflation in the referenced literature. Evidence suggests the presence of a slightly lower ERPT on consumer healthcare prices. As a result, no indication of an effect on the services or insurance indices was found, but a significant effect on the drugs and devices indices was found, affecting out-of-pocket expenditure (Prada et al., 2019).

Additionally, the paper by Rompas and Tuhatelu (2023) investigates the relationship between exchange rate fluctuations and sector indices in Indonesia, finding a significant unidirectional relationship between the health sector index and exchange rate changes. In contrast, the study by Musandiwa and Ngwakwe (2023) examines the impact of exchange rate fluctuations on the consumer price index in South Africa; however, it does not address the health sector or broader macroeconomic effects. In the study conducted by Dzupire (2020), the reciprocal dependence between inflation and exchange rates, as well as their positive correlation and co-movement, are further supported. The study concludes that increases in exchange rates lead to changes in inflation rates. This relationship highlights the critical role of exchange rate fluctuations in shaping inflation dynamics, particularly in economies that are significantly exposed to international trade and exchange rate volatility. The study conducted by Usupbeyli and Ucak (2020) examines the effects of fluctuations in the exchange rate (ER) in USD terms on the Consumer Price Index (CPI) and the Producer Price Index (PPI) in Turkey during the period from January 2003 to October 2019. The results reveal a long run cointegration relationship between the series, with a bidirectional causality relationship between CPI and ER, and a unidirectional causality from ER to PPI. However, like other studies, the healthcare sector is not addressed in this article. The relationship between exchange rates and the healthcare price index in Turkey is a significant issue, particularly when considering the country's sensitivity to international trade and fluctuations in exchange rates. However, a limited number of studies examining the relationship between exchange rates and the healthcare price index in the literature indicate a gap in knowledge in this area. This situation highlights the need for further research evaluating the effects of exchange rate fluctuations specifically within the healthcare sector.

3. METHODS

The data set, which examines the relationship between the changes in the nominal exchange rate and the health price index, in terms of the Turkish economy are nominal exchange rate (in

dollar terms) and domestic health consumer price index (2003=100) in this study. The data were obtained monthly from the Central Bank of the Republic of Turkey (CBRT) electronic data distribution system (CBRT, 2024). The data is between 2006:01-2024:10. E-views 9.0 econometrics package program was used in the analysis. NER is Nominal Exchange Rate and HCPI is Health Consumer Price Index.

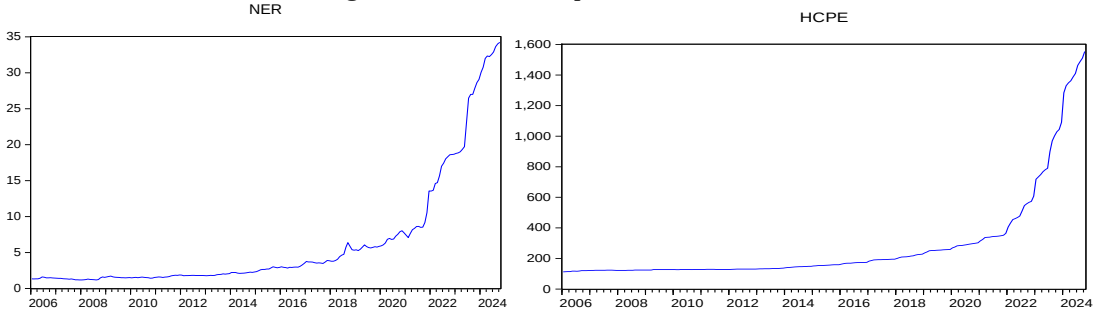
First we obtained the descriptive statistics for the both variables. The results are in the Table 1.

Table 1. The descriptive statistics for the variables.

Statistics	Nominal Exchange Rate	Health Consumer Price Index
Mean	6.256067	283.1354
Median	2.676192	154.7200
Maximum	34.23258	1553.970
Minimum	1.176086	112.4700
Standard Deviation	8.142475	306.6027

The summary statistics for the Nominal Exchange Rate and the Health Consumer Price Index reveal notable patterns. The Nominal Exchange Rate has a mean of 6.256 and a median of 2.676, indicating a right-skewed distribution with higher values pulling the mean upward. Its wide range (1.176 to 34.233) and high standard deviation (8.142) reflect significant volatility over the observed period. Similarly, the Health Consumer Price Index exhibits a mean of 283.135 and a median of 154.720, again suggesting a right-skewed distribution due to the influence of extreme values. Its range (112.470 to 1553.970) and high standard deviation (306.603) underscore considerable variability. These findings suggest substantial fluctuations in both variables, with potential implications for economic analysis, particularly concerning the interplay between exchange rate movements and health-related costs.

Figure 1. The Line Graph for the Variables



According to this, the Equation (1) is below;

$$HCPE_t = \gamma_0 + \sum_{i=1}^{k}(\alpha_{1i} HCPE_{t-1}) + \sum_{j=k+1}^{dmax}(\alpha_{2j} HCPE_{t-j}) + \sum_{i=1}^{k}(\mu_{1i} NER_{t-1}) + \sum_{j=k+1}^{dmax}(\mu_{2i} NER_{t-1}) + \varepsilon_{1t} \quad (1)$$

Based on the VAR($_{p+dmax}$) model in Equation (1), one can search test the existence of causal relationships between variables by testing the following hypotheses:
H_0:There is no causality from NER to HCPI
H_1:There is causality from NER to HCPI

The Toda and Yamamoto causality approach was used to obtain robust results on dual causality relationships between NER and HCPI. The Toda and Yamamoto causality test has several advantages compared to alternative methods. One of its key strengths is that it does not require pre-testing for stationarity or cointegration, making it robust against issues of mixed integration orders among variables (e.g., I(0), I(1)). This flexibility allows researchers to analyze causality without the risk of misspecification due to incorrect unit root or cointegration test results. Additionally, the method ensures that the Wald test for Granger causality is valid by augmenting the model with additional lags based on the maximum integration order, reducing the likelihood of bias or incorrect inferences. This feature makes it particularly useful for economic and financial time series, which often exhibit complex integration properties. Overall, the Toda-Yamamoto approach offers a straightforward yet powerful alternative for causality analysis in settings with potential model uncertainties (Toda & Yamamoto, 2005).

In the study, firstly, the results of the unit root test analysis, in which the stationarity of the variables were tested with Augmented Dickey–Fuller (ADF) test. ADF unit root test results are interpreted considering the ADF test value and probability value. As a result of the test, if the absolute value of the ADF value is less than the critical value, the hypothesis is accepted and it is decided that it is not stationary because there is a unit root in the series. As a result of the unit root test, if the absolute value of the ADF value is greater than the critical value, it is accepted and it is determined that the series becomes stationary because it does not contain a unit root. With the Augmented Dickey-Fuller unit root test, a probability value greater than 0.05 indicates that the series contains a unit root and that the series is not stationary. If the probability value is less than 0.05, it shows that the series does not contain a unit root and is stationary (Aral, 2015, p. 71). ADF test consists of adding constant and/or constant and trend to the following regression equation. (Gujarati, 2004, p. 817).

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \, \Delta Y_{t-1} + \varepsilon_i \quad (2)$$

In the equation ε_i represents the error term, ΔY_{t-1} shows differences such as $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$.

4. RESULTS

In this section, we begin by examining the results of the unit root tests to determine the "dmax" in the data. To achieve this, we applied the traditional Augmented Dickey-Fuller (ADF) test, which includes both a constant term and a trend in the test equations, following a visual inspection of the time series plots. Table 2 presents the results of these conventional unit root tests.

Table 2. ADF Unit Root Test Results of Variables

Method-Constant and Trend	Time Series	Statistic	p	%1*	%5*	%10*	Result
ADF test-I_0	NER	-2.82	1.000	-3.99	-3.43	-3.13	unit root exists, not stationary
ADF test-I_1	ΔNER	-6.90	0.000	-3.99	-3.43	-3.13	No unit root, stationary

ADF test-I_0	HCPI	-1.71	0.741	-4.00	-3.43	-3.13	unit root exists, not stationary
ADF test-I_1	ΔHCPI	-0.261	0.999	-4.00	-3.43	-3.13	unit root exists, not stationary
ADF test-I_2	ΔΔHCPI	-6.59	0.000	-4.00	-3.43	-3.13	No unit root, stationary
Method-Intercept	**Time Series**	**Statistic**	**p**	**%1**	**%5**	**%10**	**Result**
ADF test-I_0	NER	-5.16	1.000	-3.45	-2.87	-2.57	unit root exists, not stationary
ADF test-I_1	ΔNER	-5.71	0.000	-3.45	-2.87	-2.57	No unit root, stationary
ADF test-I_0	HCPI	1.03	0.999	-3.46	-2.87	-2.57	unit root exists, not stationary
ADF test-I_1	ΔHCPI	1.42	0.999	-3.46	-2.87	-2.57	unit root exists, not stationary
ADF test-I_2	ΔΔHCPI	-3.94	0.020	-3.46	-2.87	-2.57	No unit root, stationary

* MacKinnon (1996) one-sided p-values. * Indicates that the variable was stationary. The optimal lag length was selected based on the Modified Akaike Information Criterion (MAIC).

ADF test results are presented for NER and HCPI series by testing both constant and constant-intercept models. In the ADF unit root test, the one-way probability values of the level analysis results of all series were greater than 0.05. Therefore, the series are not $I_{(0)}$ and must be made stationary by taking their differences. As seen in the table, the first differences of the series were taken. At the first difference, the probability values of the NER series were less than 0.05 in both the trend and constant and trend models. Therefore, the NER series is $I_{(1)}$ in both the constant and constant-trend models. On the other hand, in the HCPI series, when the second difference was taken instead of the first difference, the probability values were less than 0.05 in both the trend and constant and trend models. Therefore, the HCPI series is $I_{(2)}$ in both the constant and constant-trend models. Thus, we use maximum degree of integration (dmax) as 2 to avoid the loss of long-run information.

After identifying the maximum degree of integration, we first determined the optimal lag length for the VAR(p) model. Then, we included the "dmax" value as an exogenous variable in the VAR(p) model. The optimal lag length for the VAR model was selected as 5, based on the Akaike Information Criterion (AIC), ensuring that the underlying assumptions of the VAR model were met. Table 3 shows the results of the Toda-Yamamoto causality test based on Equation (1).

Table 3. Toda-Yamamoto Causality Test Results

Null Hypotheses	**Calculated Statistics**	**Prob.**	**(p+dmax)**
There is no causality from NER to HCPI	47.12*	0.000	2+5
The reverse causality (From HCPI to NER) Equation	13.23	0.970	2+5

* The causality is shown at a 5% significance level. The p-value corresponds to the optimal number of lags determined using the VAR model, with all conditions for the VAR model being met in the VAR(p) specification. The dmax value represents the maximum degree of integration obtained through the unit root tests.

According to the results in Table 3, using the Toda-Yamamoto approach, the results show that the null hypotheses, which is NER is not the cause of HCPI, have been rejected. Thus, from data between 2006:01-2024:10, there was a causality from (NER) Nominal Exchange Rate to (HCPI) Health Consumer Price Index. On the other hand, the reverse relationship was also examined, but the causality from HCPI to NER was not found to be significant.

5. CONCLUSION

This study investigates the existence of a causality relationship between nominal exchange rate changes and the health price index in the context of the Turkish economy. Analyses were conducted using Toda and Yamamoto causality tests on data from the period 2006:01 to 2024:10 for the nominal exchange rate (in dollar terms) and the domestic health consumer price index. As a result of the analysis, the null hypothesis H0, which states "there is no causality from NER to HCPI," was rejected. Therefore, it was concluded that there is a causality relationship from NER to HCPI. This result indicates that changes in the Nominal Exchange Rate have a significant impact on the Health Consumer Price Index and that exchange rate changes affect health prices. Such a causality relationship provides important insights for policymakers and economists to understand the effects of exchange rate movements on health costs. Considering the impact of exchange rate fluctuations on healthcare costs is critical in forming health policies, especially in economies dependent on foreign currencies. Increases in exchange rates can raise the costs of imported health products, thereby increasing overall health expenditures. This situation can make access to healthcare services more difficult for consumers and threaten the sustainability of healthcare systems. Particularly during the COVID-19 pandemic, countries worldwide have faced similar challenges. In economies like Turkey, the increased demand for healthcare services due to the COVID-19 pandemic and the rising costs of imported health products due to exchange rate fluctuations have significantly impacted healthcare costs. From this perspective, several policy recommendations can be made to control cost increases in the healthcare sector and mitigate the adverse effects of exchange rate fluctuations. Firstly, promoting the production of domestic health products and investing in this area can reduce countries' dependence on imported products, thereby alleviating the impact of exchange rate movements. Additionally, updating the prices of medical supplies and pharmaceuticals is crucial to mitigate the effects of exchange rate fluctuations. When the exchange rate increases, the costs of imported health products also rise, ultimately affecting consumers. This situation can particularly increase the costs of essential drugs and medical devices used in treating diseases, potentially leading to significant financial problems for patients and their families. In Turkey, the Ministry of Health generally utilizes a reference price system when determining drug prices. This system is based on averaging the prices of a particular drug across European countries where it is sold at the lowest cost (Republic of Turkey Ministry of Health, Decision No. 2015/7752 on Pricing of

Human Medicinal Products). However, fluctuations in exchange rates often lead to mismatches between these reference prices and the actual costs in Turkey. Therefore, the existence of a price updating system that can rapidly respond to exchange rate fluctuations is necessary. Additionally, it is a significant issue that price increases for medications that must be purchased without reimbursement directly impact citizens, as the Ministry of Health does not provide payment support. This situation can impose a serious financial burden on patients or their families. Considering potential inequalities in access to healthcare services, it is essential to develop policies addressing this issue. In this context, expanding the coverage of health insurance through the Social Security Institution (SGK) could include medications and health products particularly affected by exchange rate fluctuations under insurance coverage. This could potentially alleviate financial inequalities in accessing healthcare services. As a result, this article that elucidates the causality relationship between exchange rate changes and health prices is particularly significant for policymakers in understanding the effects of exchange rate movements on healthcare costs. Moreover, it provides informative insights and policy recommendations to prompt action in this regard.

DECLARATION OF THE AUTHORS

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