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The Asymmetric Impacts of Economic, Social, and Political Globalization on Inflation

Ekonomik, Sosyal ve Siyasi Küreselleşmenin Enflasyon Üzerindeki Asimetrik Etkileri

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ABSTRACT

This study aims to investigate the asymmetric effects of globalization on inflation. While theoretical and applied studies emphasize the negative effect of globalization on inflation, they explain this through market mechanisms and efficiency. In an open economy, the need for seigniorage incomes decreases, as the incomes obtained as a result of trade will increase. An economy that increases foreign trade revenues needs less seigniorage revenues. Foreign trade income will result in a decline in inflation if an increase in the money supply is the primary cause of inflation. Romer (1993) emphasizes that the other channel that reveals the negative effect of globalization on inflation is the market mechanism. In this instance, the presence of foreign currencies that can take the place of the national currency in an open economy helps to lower inflation. Also, inflation is reduced by economic openness because it allows for specialization and economies of scale. This study uses the annual data of Turkey's consumer price index, GDP per capita, general government final consumption expenditures (% of GDP), globalization index-KOF (economic, political, and social globalization indexes), and exchange rate variables for 1970-2021. The non-linear autoregressive distributed lags (NARDL) estimation method is used in the analysis of the asymmetric effect of different components of globalization on inflation. The findings reveal that economic and social globalization has an asymmetric effect on inflation; however, also revealed is the non-significance of the asymmetrical effect of political globalization on inflation.

Keywords: Economic Globalization, Social Globalization, Political Globalization, Inflation, Non-Linear ARDL

Jel Code: B23, F6, E31

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ÖZ

Bu çalışma, küreselleşmenin enflasyon üzerindeki asimetrik etkilerini araştırmayı amaçlamaktadır. Teorik ve uygulamalı çalışmalar küreselleşmenin enflasyon üzerindeki olumsuz etkisini vurgulamaktadır. Bu negatif etki, piyasa mekanizması ve verimlilik üzerinden açıklamaktadır. Senyoraj gelirlerine bağımlı olan kapalı bir ekonomi yerine dışa açık bir ekonominin geçmesi, dış ticaret sonucu elde edilen gelirleri artıracağından senyoraj gelirlerine olan ihtiyaç azalmaktadır. Dış ticaret gelirlerini artıran bir ekonomi, daha az senyoraj gelirine ihtiyaç duyar. Enflasyonun ana nedeni para arzındaki artış olarak kabul edilecek olursa, dış ticaret geliri enflasyonda düşüşe neden olacaktır. Romer (1993), küreselleşmenin enflasyon üzerindeki olumsuz etkisini ortaya koyan diğer kanalın piyasa mekanizması olduğunu vurgulamaktadır. Bu durumda açık bir ekonomide ulusal paranın yerini alabilecek yabancı para birimlerinin varlığı enflasyonun düşürülmesine yardımcı olmaktadır. Ayrıca, üretimde uzmanlaşmaya ve ölçek ekonomisine izin verdiği için ekonomik açıklık enflasyonu azaltmaktadır. Bu çalışmada 1970-2021 yılları için Türkiye'nin tüketici fiyatları endeksi, kişi başına düşen GSYİH, Genel Devlet Nihai Tüketim Harcamaları (GSYİH'nin yüzdesi), Küreselleşme Endeksi-KOF (ekonomik, politik ve sosyal küreselleşme endeksleri) ve döviz kuru değişkenlerinin yıllık verileri kullanılmaktadır. Küreselleşmenin farklı bileşenlerinin enflasyon üzerindeki asimetrik etkisinin analizinde Doğrusal Olmayan Otoregresif Dağıtılmış Gecikme (NARDL) modeli tahmin yöntemi kullanılmaktadır. Çalışmanın bulguları, ekonomik ve sosyal küreselleşmenin enflasyon üzerinde asimetrik bir etkiye sahip olduğunu ortaya koymaktadır. Bunun yanı sıra politik küreselleşmenin enflasyon üzerindeki etkisi anlamsızdır.

Anahtar Kelimeler: Ekonomik Küreselleşme, Sosyal Küreselleşme, Siyasi, Küreselleşme, Enflasyon, Doğrusal Olmayan ARDL

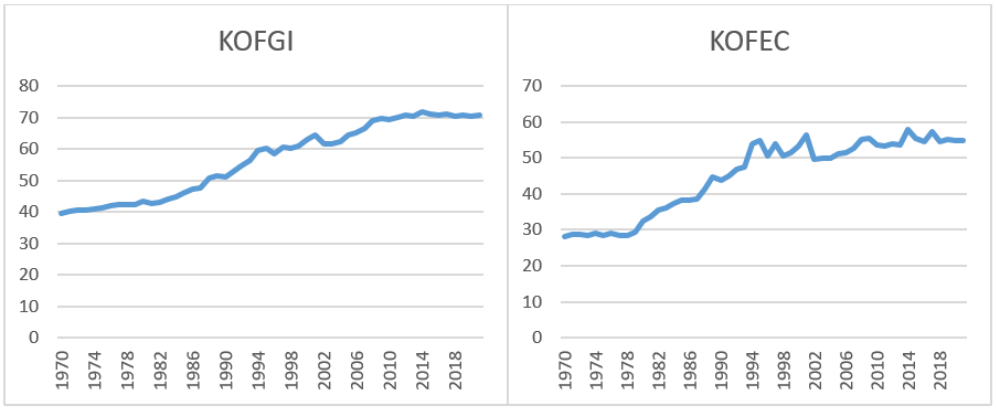
Jel Sınıflaması: B23, F6, E31

1. Introduction

Since the 1970s, policies such as increasing free capital movements and foreign direct investment flows, as well as the establishment of regional economic and trade unions have increased the foreign trade of all countries of the world and accelerated globalization. The extension of commercial globalization into the financial sector has improved economic, social, and political ties between all nations in the world. Globalization, with its narrow definition and in the economic context, expresses the interdependent relations of the countries of the world. In a broad sense, globalization means an increase in the relations of countries with each other in all fields. Similar to the global economic climate, in the 1960s and 1970s Turkey implemented a basic economic development strategy based on import-substitution policies. Due to the fixed exchange rate regime, the overvalued local currency limited Turkey's competition power in exports. While large public investments to produce heavy industry and capital goods aimed to meet domestic demand, there were quantitative restrictions on foreign trade. The emergence of the oil crisis as a result of the reduction of oil supply by the OPEC (Organization of Petroleum Exporting Countries) in 1979 and the low domestic savings and investment environment in Turkey led to a balance of payments crisis. To get out of the crisis, "January 24, 1980 decisions" were implemented, and Turkey's trade liberalization process began. Within the framework of these decisions, export-led growth was encouraged and the Turkish lira was allowed to depreciate in real terms to increase Turkey's competitiveness in exports by providing export subsidies. As a result of these developments, Turkey's level of globalization began an increasing trend after 1980. Economic globalization took a horizontal path between 1985 and 1987. Turkey liberalized its foreign exchange policy in 1989 with Decision No. 32, and the country's economy proceeded to become more globally integrated until 1995. The 1994 crisis was caused by the sharp rise in the domestic debt stock, inflation, and deficits in the budget and current account. After this, a package of economic measures was unveiled on April 5, 1994, and a 14-month stand-by agreement was made with the International Monetary Fund (IMF). Turkey's globalization index rose between 1995 and 2001. Despite the fact that Turkey's financial sector suffered a crisis environment in 2000 and 2001, the globalization index rose after 2003 as a result of economic reforms and a stable political climate.

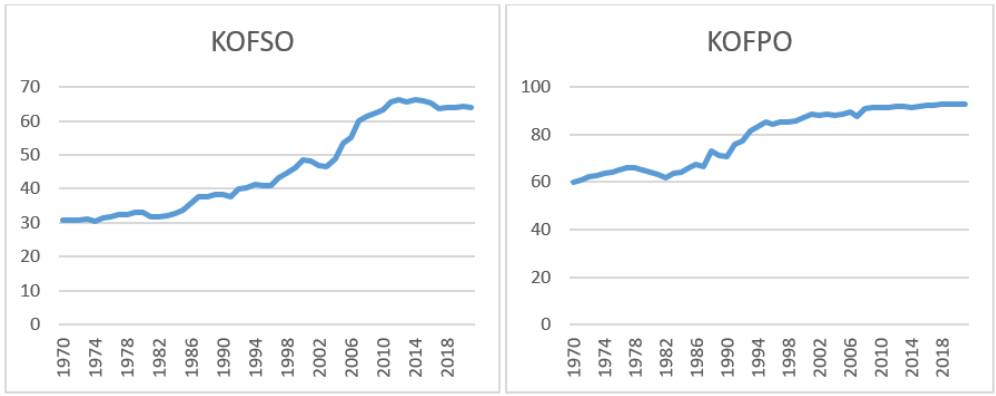
Today, international developments touch every country in the world, even at various levels. Undoubtedly, the phenomenon of globalization affects many macroeconomic variables such as economic development, employment and inflation. The studies of Iyoha (1971), Romer (1993) and Terra (1998) were pioneering studies investigating the effect of openness on the consumer price index, that is, the effect of globalization on inflation. They reached mixed results. The primary reason for these contradictory conclusions is that linked studies depend on linear modeling of the effect of globalization on inflation. The second argument is that the measures of globalization and openness are not exactly the same (Kouton, 2018). While openness is mostly measured by the ratio of the total of exports and imports to national income, the globalization index is calculated by weighting on multi-factor sub-items[1]. While analyzing the

[1] The KOF Globalization Index measures the economic, social and political dimensions of globalization. Globalization in the economic, social and political fields has been on the rise since the 1970s, receiving a particular boost after the end of the Cold War.



Source: KOF index developed by the Swiss Institute of Economics, The terms "general globalization index" and "economic globalization index" stand for KOFGI and KOFEC respectively.

Figure 1. Turkey's Globalization Index and Economic Globalization Index (1970-2021)



Source: KOF index developed by the Swiss Institute of Economics, The terms "social globalization index" and "political globalization index" stand for KOFSO and KOFPO respectively.

Figure 2. Turkey's Social Globalization Index and Economic Political Globalization Index (1970-2021)

effect of globalization on inflation, the preference for linear models can lead to misleading estimation results. Shin, Yu, & Greenwood (2014) introduced the NARDL model, which provides the opportunity to estimate the asymmetric effect of the independent variable on the dependent variable by including the positive and negative changes of the residual variables in the model.

This study aims to investigate the asymmetric effects of globalization on inflation. The objective of this study is to estimate the short- and long-term effects of negative and positive changes in globalization on inflation by using the NARDL model, which reveals nonlinear asymmetric relations. In this study, the NARDL approach follows the model suggested by Shin et al. (2014). For this purpose, we use Turkey's consumer price index, GDP per capita, general government final consumption expenditures (as a percentage of GDP), globalization index-KOF (economic, political, and social globalization indices), and exchange rate data for the period 1970-2021.

2. Literature Review

Market mechanisms and productivity channels are used by theoretical and practical investigations to explain how globalization harms inflation. Romer (1993) focused on the effect of openness in his theory that expresses the trade-off between inflation and output. He emphasized that openness hurt inflation, but he stated that inflation in developed countries was not affected by openness. In an open economy, there is less need for seigniorage incomes because more money is made through foreign trade. It is clear from the context that creating money is the primary cause of inflation. As a result, an open economy generates more money through foreign trade. Lower inflation rates are associated with

economies that generate fewer seigniorage revenues. Romer (1993)[2] highlights that the market mechanism is the other channel that demonstrates the negative impact of globalization on inflation. In this instance, the presence of foreign currencies that can take the place of the national currency in an open economy helps to lower inflation. Additionally, openness reduces inflation by increasing competition.

According to Jin (2000), more foreign investment, better capacity utilization, and more effective resource usage are the major mechanisms via which openness hurts inflation. Thus, it appears that more effective resource allocation with the impact of foreign investments is a factor in lowering inflation in open economies. While Iyoha (1973) reveals the negative effect of openness on inflation for underdeveloped countries, Triffin and Grudel (1962) and Whitman (1969) found results confirming the same effect for developed countries. Iyoha (1973) used the import/income ratio to measure openness. This negative effect is that the increase in openness promotes capital accumulation and thus reduces inflation. Sachsida et al. (2003) determined that openness had a negative effect on inflation in 152 countries using the same clearance formula as Iyoha (1973). Samimi et al. (2012) used a panel data technique to explain the effect of openness on inflation in developed and developing countries by measuring openness as the ratio of the sum of imports and exports to GDP. They show that openness has a positive effect on inflation. When the KOF globalization index—another indicator of openness—is utilized, however, the effect of openness on inflation is negative. On the other hand, using a mechanism similar to that of Philips and employing the KOF index for openness, Syed (2012) reveals that an increase in openness increases output and employment and causes an increase in inflation. Similarly, Syed and Zwick (2015) reached their conclusions by doing a theoretical investigation of the relationship between trade openness and inflation in the framework of a nonlinear convex Philips curve. An increase in openness leads to an increase in economic activity. This has a negative effect on unemployment and inflation, especially for countries with high export potential. The import price channel is also a theoretical channel in which openness affects inflation negatively. In fact, low-cost imports have a significant impact on lowering inflation in high-priced economies.

Using the ARDL model, Afzal et al. (2013) found a negative relationship between inflation and openness in both the short and long run for Pakistan during the period 1970-2009, Ajaz et al. (2016) used the NARDL model to investigate the relationship between openness and inflation in India from 1970 to 2014. They pointed out that there was no long-term asymmetry between the negative and positive components of openness, but there was asymmetry in the short term. The inflation rate was positively and significantly impacted by the long-term negative component. Ozcag and Bolukbas (2018) found that there was a long-term "hidden" cointegration relationship between trade openness and inflation in Turkey during the 1980-2015 period. Demir (2021) used panel cointegration tests with the annual data for the years 2000–2019. He reached the conclusion that trade openness had a statistically significant effect on inflation in the D-8 economies. The studies conducted by Mercan and Gocer (2014) and Çoban (2020) do not support the Romer (1993) hypothesis. According to their findings, openness has a positive effect on inflation.

3. Model and Method

In our study, the NARDL model is used to assess the asymmetric effect of globalization on inflation in Turkey from 1970 to 2021. As such we begin with the following long-run model:

$$lcpi_t = a + blgdp_t + clggfce_t + dlkof_t + elexc_t + \varepsilon_t \quad (1)$$

where cpit is Turkey's consumer price index. It is assumed that the consumer price index depends on the level of economic activity in Turkey (gdp), on general government final consumption expenditures (ggfce), and on the globalization index (kof). Since increased globalization level boosts foreign economic integration and contact, we expect an estimate of "d" to be positive. By way of construction, a increase in the exchange rate signifies a depreciation of Lira and if Lira depreciation is to reduce imports and increase its exports, an estimate of "e" is expected to be positive and negative depending on the import dependency of intermediate goods in production. Estimates of b, c, d and e in equation (1) are long-run estimates. To estimate the short-run effects of all four exogenous variables on the consumer price index, we specify (1) in an error-correction format as follows:

[2] Openness was controlled as an import/GDP ratio. The main finding of the study is that inflation can be reduced as a result of controlled management of expansionary monetary policies of open countries. The cost advantages provided by specialization and economies of scale create disinflationary effects in an economy. When the level of openness of a country increases, the monetary policies implemented are affected by the general trend of global monetary policies. For this reason, in a global economy where inflation is constantly suppressed, individual economies continue their anti-inflationary policies as the level of openness increases.

$$\Delta lcpi_t = a^{'} + \Sigma_{k=1}^{n} b_k^{'} \Delta lcpi_{t-k} + \Sigma_{k=0}^{n} c_k^{'} \Delta lgdp_{t-k} + \Sigma_{k=0}^{n} d_k^{'} \Delta lggfce_{t-k} + \Sigma_{k=0}^{n} e_k^{'} \Delta lkof_{t-k} + \Sigma_{k=0}^{n} f_k^{'} \Delta lexc_{t-k} + \lambda_0 lcpi_{t-1} + \lambda_1 lgdp_{t-1} + \lambda_2 lggfce_{t-1} + \lambda_3 lkof_{t-1} + \lambda_4 lexc_{t-1} + \varepsilon_t \quad (2)$$

Depending on the positive and negative changes, the effect of globalization on inflation is effective at different levels and in different directions.

$$\begin{aligned} POSITIVE_t &= \Sigma_{i=1}^{t} \Delta lkof_i^{+} = \Sigma_{i=1}^{t} max(\Delta lkof_i, 0) \\ NEGATIVE_t &= \Sigma_{i=1}^{t} \Delta lkof_i^{-} = \Sigma_{i=1}^{t} min(\Delta lkof_i, 0) \end{aligned} \quad (3)$$

Following the approach and asymmetric cointegration and error-correction approach of Shin et al. (2014), we modify (4) so that we can also evaluate the short-run and long-run asymmetric effects of globalization index changes. The revised model takes the following form::

$$\Delta lcpi_t = a^{'} + \Sigma_{k=1}^{n1} b_k^{'} \Delta lcpi_{t-k} + \Sigma_{k=0}^{n2} c_k^{'} \Delta lgdp_{t-k} + \Sigma_{k=0}^{n3} d_k^{'} \Delta lggfce_{t-k} + \Sigma_{k=0}^{n4} e_k^{'} \Delta lkofpos_{t-k} + \Sigma_{k=0}^{n5} f_k^{'} \Delta lkofneg_{t-k} + \Sigma_{k=0}^{n6} g_k^{'} \Delta lexc_{t-k} + \delta_0 lcpi_{t-1} + \delta_1 lgdp_{t-1} + \delta_2 lggfce_{t-1} + \delta_3 lkofpos_{t-1} + \delta_4 lkofneg_{t-1} + \delta_5 lexc_{t-1} + \varepsilon_t \quad (4)$$

The NARDL model was developed to explain the effect of negative and positive globalization changes on inflation. The significant effect of both the positive and negative changes of globalization on inflation demonstrates the asymmetries of this influence. To determine whether the asymmetric effect is valid, it is crucial to assess the validity of both short- and long-term asymmetry. $\Sigma e_k^{'} \neq \Sigma f_k^{'}$ condition is required for short-term asymmetry to be valid and $\delta_3 \neq \delta_3$ for the long-term asymmetry. The Wald statistic tests the short and long-term validity of asymmetric effects.

3.1. Data Definition and Sources

In this study, we used annual data from Turkey's KOF index (economic, political, and social globalization indices), consumer price index, GDP per capita, general government final consumption expenditures, and exchange rate variables from 1970 to 2021.

The consumer price index is used to measure inflation, and the data is obtained from the IMF database. The KOF, also known as the globalization index, is one of the variables that measures a country's openness. Although the ratio of a country's total imports and exports to its national GDP is frequently used to measure openness, the KOF index, which was developed by the Swiss Institute of Economics, is considered as a more comprehensive indicator of globalization (Samimi et al., 2012; Syed, 2012). Information regarding a country's economic, social, and political globalization is included in the KOF index, which was created by accounting for the many aspects of globalization. Economic globalization comprises trade and financial globalization; social globalization considers interpersonal, informational, and cultural globalization. Political globalization is concerned with the interaction of local and foreign governments, as well as the extent to which governments can access foreign resources. The value range for the KOF index is between 1 and 100. 1 value indicates a closed country with no globalization, whereas the KOF index of the nation with the maximum amount of globalization is stated with 100 value. GDP per capita, general government final consumption expenditure (as a percentage of GDP), and exchange rate are additional control variables utilized in the NARDL model. These aforementioned control variables have been widely preferred in studies dealing with the relationship between openness and inflation. The World Bank database provided the information for these variables. The model includes each variable in its natural logarithmic form.

3.2. Unit Root Test

The stationarity levels of the series must be established before estimating the NARDL model. The variables must not be second-order integrated for the NARDL model to be valid. Also, the dependent variable must be first order integrated I(1) and the independent variables must be level I(0) or first-order integrated I(1). Unit root testing, which especially takes into consideration structural break, should be employed to be compatible with the nonlinear characteristics of the NARDL model. Thus, when there is considered to be a structural break in the data, consistent results are obtained regarding the stochastic characteristics of the data. The unit root test proposed by Zivot and Andrews (1992) is used in

Table 1. Zivot-Andrews Unit Root Test Results

Variable	Intercept				Trend				Intercept and Trend			
	Breakpoint	Lag	Min. t value	5% Critical Value	Breakpoint	Lag	Min. t value	%5 Critical Value	Breakpoint	Lag	Min. t value	5% Critical Value
lcpi	2010	1	-7.47	-4.93	2005	1	-7.60	-4.42	2003	1	-7.88	-5.08
lkof^{+}	1992	0	-2.41	-4.93	2008	0	-3.17	-4.42	1996	1	-4.31	-5.08
lkof^{-}	2002	0	-4.55	-4.93	2003	1	-8.04	-4.42	1996	0	-4.56	-5.08
lkofec^{+}	1988	0	-2.59	-4.93	1981	1	-8.18	-4.42	1994	0	-5.32	-5.08
lkofec^{-}	2002	0	-3.43	-4.93	2003	1	-8.27	-4.42	1996	1	-9.21	-5.08
lkofpo^{+}	1988	0	-3.92	-4.93	2001	0	-3.39	-4.42	1991	0	-3.91	-5.08
lkofpo^{-}	1979	0	-3.98	-4.93	1990	0	-4.03	-4.42	1983	1	-5.20	-5.08
lkofso^{+}	2004	0	-3.77	-4.93	2013	0	-2.58	-4.42	2004	1	-6.95	-5.08
lkofso^{-}	1981	0	-4.50	-4.93	1982	0	-3.84	-4.42	1983	1	-7.04	-5.08
lgdp	1979	0	-3.62	-4.93	2002	0	-3.26	-4.42	2011	1	-7.08	-5.08
lggfce	1989	1	-7.50	-4.93	1991	1	-6.75	-4.42	1986	1	-7.65	-5.08
lexc	1991	0	-3.32	-4.93	2001	0	-4.38	-4.42	1994	0	-5.13	-5.08

this investigation. While the alternative hypothesis states that the series does not have unit roots with a structural break, the null hypothesis expresses the existence of a unit root with a breakpoint.

The results of the unit root test by Zivot and Andrews (1991) are presented in specifications including Intercept, Trend, and Intercept-Trend in Table 1. The specification with intercept should be preferable when examining at the serial graphs of the variables. Also, while lcpi and lggfce are stationary in first-order I(1), other variables are stationary in level I(0).

Table 2. Breakpoint Unit Root Test (Perron and Vogelsang, 1992; Vogelsang and Perron, 1998)

Variable	Level	First deference
Lcpi	-4.31	-7.90*
lkof^{+}	-4.02	-6.74*
lkof^{-}	-3.34	-11.18*
lkofec^{+}	-3.02	-7.70*
lkofec^{-}	-3.04	-10.46*
lkofpo^{+}	-5.62*	-8.02
lkofpo^{-}	-5.23*	-7.30
lkofso^{+}	-2.28	-6.21*
lkofso^{-}	-1.86	-8.84*
Lgdp	-2.12	-7.24*
Lggfce	-3.60	-7.31*
Lexc	-4.58**	-4.66

The unit root test results of the specification with intercept are shown in Table 2. While lkofpo+ , lkofpo- and lexc are stationary in I(0), other variables are stationary in I(1).

3.3. Results and Findings

Table 3. NARDL Model Results

Variable	Model-1 Globalization	Model-2 Economic Globalization	Model-3 Social Globalization	Model-4 Political Globalization
$lcpi_{t-1}$	-0.70***	-0.27***	-1.01***	-0.54***
	(0.12)	(0.10)	(0.13)	(0.09)
$lkof^{-}_{t-1}$	30.31***	9.31***	-8.94*	3.88
	(6.43)	(1.45)	(4.46)	(3.21)
$lkof^{+}_{t-1}$	-10.70***	-7.83***	-7.72***	-2.10
	(2.55)	(1.68)	(1.53)	(1.67)
$lexc_{t-1}$	-0.45***	-0.35***	-0.10*	0.01
	(0.12)	(0.12)	(0.05)	(0.08)
$lgdp_{t-1}$	4.07***	7.32***	2.74***	1.43***
	(0.71)	(0.99)	(0.67)	(0.35)
$lggfce_{t-1}$	0.96***	-0.10	0.63**	-0.09
	(0.33)	(0.27)	(0.29)	(0.30)
$\Delta lexc$	-0.95***		-1.04***	-0.96***
	(0.26)		(0.20)	(0.28)
$\Delta lexc_{t-2}$	0.38		-0.41*	-0.53**
	(0.24)		(0.22)	(0.23)
$\Delta lexc_{t-3}$			-0.66***	
			(0.22)	
$\Delta lexc_{t-4}$				-0.48**
				(0.22)
$\Delta lcpi_{t-1}$		-0.45***	0.28*	
		(0.15)	(0.11)	
$\Delta lcpi_{t-2}$		-0.49***		-0.32***
		(0.13)		(0.10)
$\Delta lcpi_{t-3}$	-0.36***	-0.46***		-0.37***
	(0.10)	(0.13)		(0.10)
$\Delta lcpi_{t-4}$		-0.30**		
		(0.13)		
$\Delta lggfce_{t-1}$				1.45***
				(0.44)
$\Delta lggfce_{t-3}$			1.20***	
			(0.42)	
$\Delta lgdp$				-2.94***
				(1.05)
$\Delta lgdp_{t-1}$	-1.88**	-6.88***		-2.01**
	(0.97)	(1.52)		(0.93)

Table 3. Continued

$\Delta lgdp_{t-2}$		-3.54***		
		(1.18)		
$\Delta lgdp_{t-3}$		-2.69**		
		(1.02)		
$\Delta lkof^{-}$			6.88	
			(4.04)	
$\Delta lkof^{-}_{t-1}$	-12.18**	-4.95***	18.37***	
	(6.07)	(1.72)	(5.27)	
$\Delta lkof^{-}_{t-2}$			26.94***	13.73**
			(5.94)	(5.69)
$\Delta lkof^{-}_{t-3}$	-8.73**		18.75***	
	(4.91)		(5.66)	
$\Delta lkof^{-}_{t-4}$			15.26***	
			(5.38)	
$\Delta lkof^{+}$	-8.56**		-8.58***	
	(3.82)		(1.97)	
$\Delta lkof^{+}_{t-2}$				6.94**
				(2.62)
$\Delta lkof^{+}_{t-3}$	9.86***		6.19***	7.47***
	(3.47)		(1.65)	(2.46)
$\Delta lkof^{+}_{t-4}$		3.76**	-2.98*	6.43**
		(1.52)	(1.65)	(2.44)
Constant	-28.30***	-54.18***	-19.23***	-9.97***
	(5.09)	(7.24)	(5.21)	(2.97)
R^2	0.76	0.76	0.87	0.84
Adj. R^2	0.66	0.65	0.77	0.74
F-stat.	11.05***	15.19***	19.47***	10.63***
$Wald_{long}$	6.89***	3.04***	-0.31	1.60
$Wald_{short}$	-2.88***	-3.21***	-4.08***	-0.74
$lkof^{-}_{long}$	43.3	34.48	-8.85	7.18
$lkof^{+}_{long}$	-15.28	-29.00	-7.64	-3.88
Ramsey	0.47	0.01	0.0006	0.72
B.G. LM test	0.98	1.38	4.19**	2.98*
B.P.G. test	0.84	1.29	2.21**	1.02
Jarque-Bera Normality test	0.45	0.97	0.38	1.17

Note: 10%, 5%, 1% and standard errors are represented as significance levels by ***, **, *, and ( ) respectively. The critical values of Pesaran et al. (2001) in case III are 4.29 and 5.61 for I(0) and I(1), respectively. Long-term coefficients of globalization variables are $lkof^{-}_{long}$ and $lkof^{+}_{long}$; the $Wald_{long}$ and $Wald_{short}$ which inform as to whether long and short-term coefficients are asymmetrical.

The NARDL model estimates four diferent models, including general globalization (model 1), economic globalization (model 2), social globalization (model 3), and political globalization (model 4), to evaluate the impact of globalization on inflation. A maximum of four lags are imposed to the variables because the series are utilized annually in the model, and the Akaike Information Criterion (AIC) is also used to determine the optimal lags. Table 3 shows short-term coefficient estimates, long-term coefficient estimates, and diagnostic test results. If we look at the short-term estimations in Table 3, we can see that there are significant effects of general globalization, economic globalization, social globalization, and political globalization on inflation in models 1, 2, 3, and 4. The results of the long-term coefficient estimation is used to determine whether or not this relationship continues long-term. The long-term coefficient is calculated by dividing the coefficients of the positive and negative globalization variables to the negative coefficient of the dependent variable. While the long-term effects of general globalization, economic globalization and social globalization on inflation are significant in Turkey, the effect of political globalization on inflation is not significant. The variables may be cointegrated because at least one of the long-term coefficients is significant (there is a long-term relationship). The F test result is used to determine whether cointegration exists, and the conclusion was reached that cointegration exists because the calculated test statistical value is larger than the critical value. The effects of positive and negative globalization on inflation are not equal in magnitude and direction when regarded as sub-items of globalization. The interpretation of the coefficients provides a better understanding of the non-linear effects of globalization on inflation. First, it is concluded that a 1% increase in general globalization decreases inflation by 15.28%, and a 1% decrease in general globalization reduces inflation by 43.3% in model 1. According to these findings, globalization's negative effects result in a greater reduction in inflation. Model-2 estimation results, which explain the effect of positive and negative changes in economic globalization on inflation, show that a 1% decrease in economic globalization reduces inflation by 34.48%; a 1% increase in economic globalization reduces inflation by 29%. The negative effects of economic globalization have a greater impact on inflation. The results of Model-3 show that when social globalization decreases by 1%, the inflation rate increases by 8.85%, and when it increases by 1%, it decreases by 7.64%. The Walt test is used to determine whether the short- and long-term asymmetric effects are valid (Shin et al., 2014). Only the short-term asymmetry is valid in Model 3, but long and short term asymmetry are both valid in Models 1 and 2. Both long term and short term asymmetry are invalid in Model 4. An examination of the serial correlation between the residues of the NARDL model shows that there is no autocorrelation except in model 3. Again, the constant variance assumption is valid for all models except model 3. The series reveals a normal distribution in all models when we examine the data distribution of the variables. The result of the reset test demonstrates the validity of the specified NARDL model specification. For the stability of the short-term and long-term coefficient estimates, Pesaran et al. (2001) suggest the well-known CUSUM (stated by CUSM) and CUSUMSQ (stated by CUSM2). The coefficient estimates are found to be within the stability limit when the CUSUM and CUSMQ tests provided in Figures 3, 4, 5, and 6 are reviewed. Finally, the strength of model fit is determined by the adjusted R2. The adjusted R2 value indicates how much of the variation in the dependent variable can be explained by all independent variables, and it is 0.66, 0.65, 0.77, and 0.74 for models 1–4, respectively.

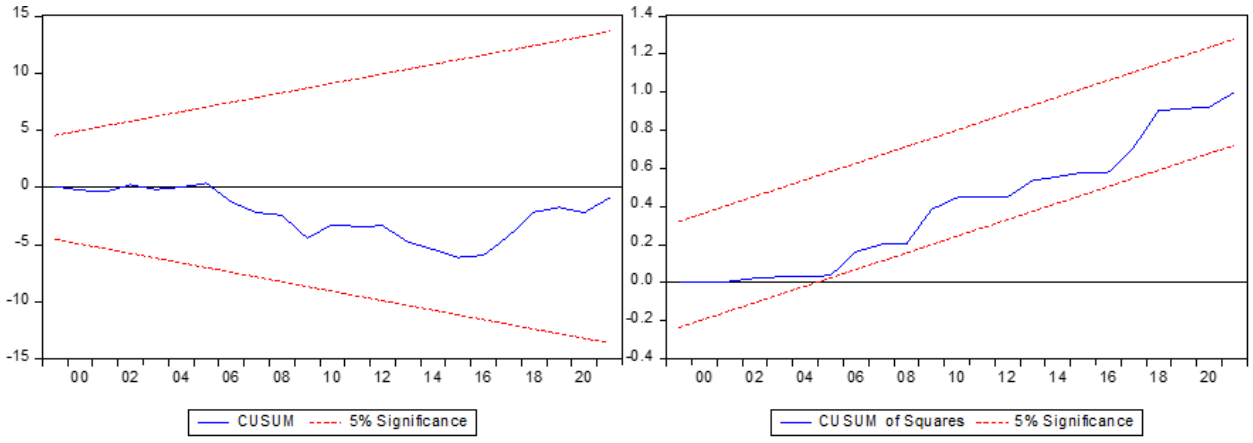


Figure 3. Model-1 CUSUM ve CUSMQ Results

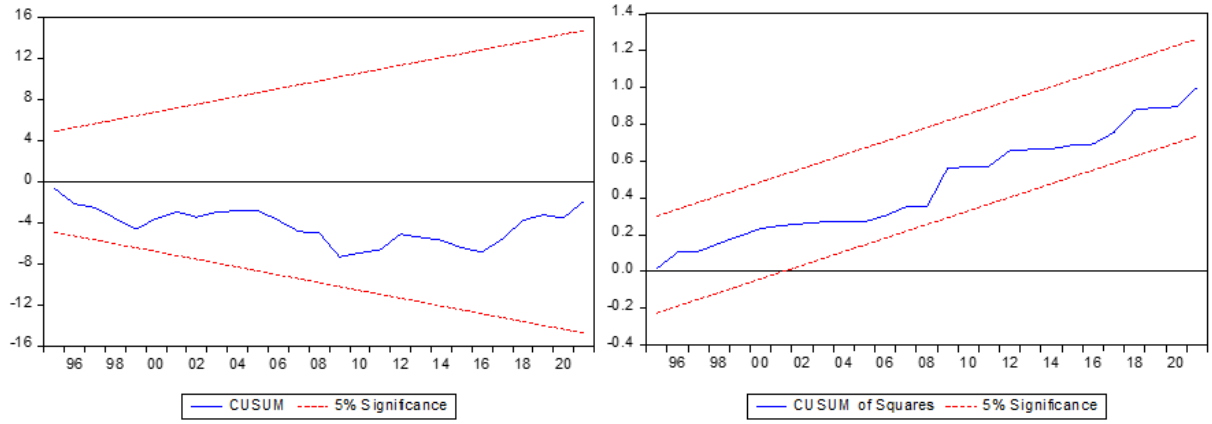


Figure 4. Model-2 CUSUM ve CUSMQ Results

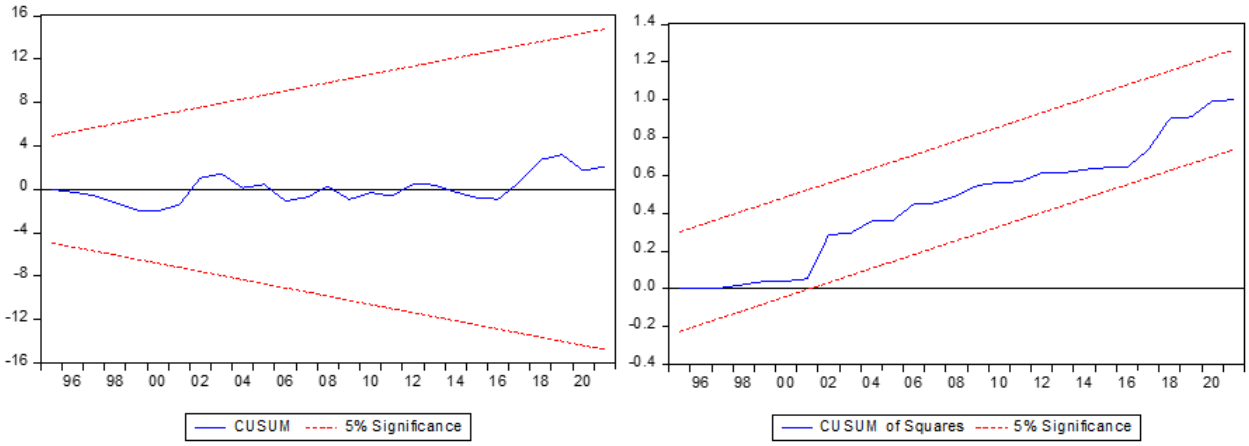


Figure 5. Model-3 CUSUM ve CUSMQ Results

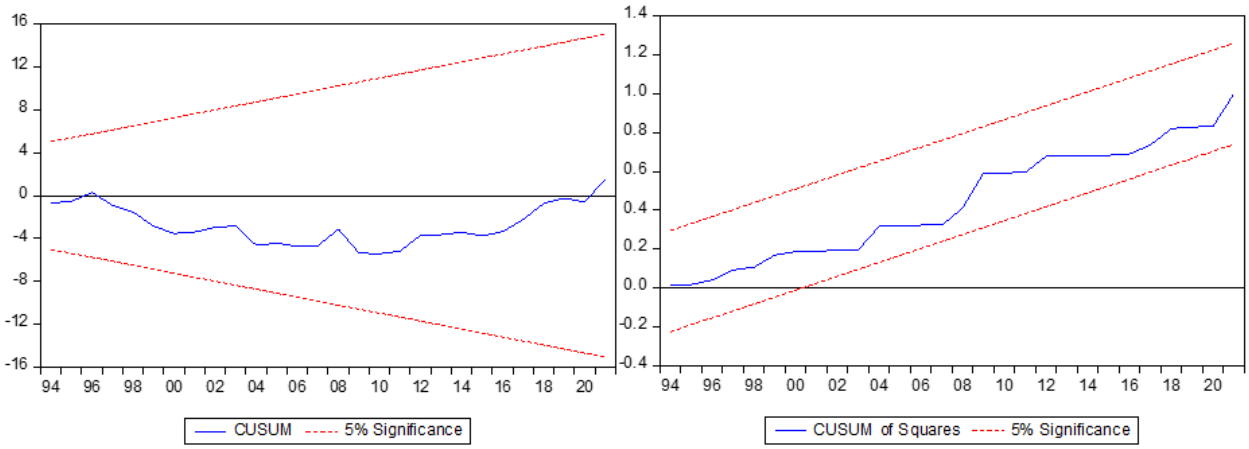


Figure 6. Model-4 CUSUM ve CUSMQ Results

4. Conclusion

The impact of globalization on inflation varies depending on the degrees of economic growth, openness, monetary policies, and production systems of the various countries. In developed countries, increased openness either does not affect inflation or reduces it. Openness has a growing impact on inflation in developing economies that rely largely on imports of intermediate products for production. Also, the use of seigniorage revenues to raise government revenues and pay debts is one of the major sources of inflation in undeveloped countries. In these economies, seigniorage income

is less necessary because of the rise in production brought on by exports and the rise in customs revenues brought on by opening up and globalization. If seigniorage revenues are the major motivation of inflation, economic openness mostly lowers inflation in underdeveloped countries. As a result, both developed and developing economies may experience a decrease in inflation as a result of globalization. However globalization and openness in the economy have different effects on inflation through several mechanisms. On one hand, economic openness decreases inflation as a result of monetary policies used in developed countries. On the other hand, economic openness decreases inflation in developing countries because it increases government revenues and decreases emission volume. Romer (1993) noted that monetary policies implemented to control inflation have a declining impact on inflation as a result of the effects of globalization and economic openness.

In general, openness is measured as the ratio of the sum of imports and exports to GDP when analyzing the relationship between inflation and openness. Samim et al. (2012), Syed (2012), and Kouton (2018) considered the globalization index to be a better measure of openness because it included several characteristics. In actuality, although foreign trade is an important measure of a country's openness, taking into account the social and political processes carried out with other countries provides comprehensive information about globalization. Based on the aforementioned considerations, the globalization index was utilized in our investigation.

Using a non-linear model, the asymmetric effects of globalization on inflation are estimated. To reveal the asymmetric effects, we considered negative and positive changes of globalization. In this study, with the help of the NARDL model, we estimated the effect on inflation when globalization is negative and positive. In Turkey, inflation responds strongly to a decrease in globalization rather than an increase in the long-term. In Turkey, where dependency on imported intermediate goods is high, a decrease in globalization reduces inflation. Due to foreign dependence on intermediate goods, one of the main outcomes of the rise in production is an increase in the import rate. Therefore, it is observed that production slows down and inflation declines in a period where imports decline. Globalization decreases by 1%, which lowers inflation by 43.3%. Again, 1% decreased economic globalization results in a 34% decrease in inflation. The findings of Kouton (2018), which control openness using the globalization index and assess its impact on inflation using the NARDL model, are consistent with the finding that the negative change of globalization is effective in reducing inflation.

After 2000, the Turkish economy put up an effective fight against inflation by implementing the Transition to Strong Economy Program and the IMF-stand-by agreement. While the Customs Union Agreement signed with the EU in 1995 led to an increase in commercial integration and economic globalization, the start of EU membership negotiations in the post-2000 period caused globalization to accelerate in social and political areas. The general feature of this period is that it is a period in which globalization increased but in which the effective struggle against inflation also continued. The study's findings demonstrate that the positive impact of globalization on inflation is consistent with Romer's findings (1993). It has been concluded that a 1% increase in globalization and economic globalization reduces inflation by 15% and 29% respectively while a 1% increase in social globalization reduces inflation by 7.6%. A 1% decrease in social globalization increases the inflation rate by 8.85%. In addition to all this, our study found that political globalization bears no significance on inflation. The growth in economic globalization has the biggest impact on lowering inflation when all aspects of globalization are considered.

As it demonstrates asymmetrical links, it is anticipated that this study will provide perspective to earlier studies that have considered the symmetrical relationships between openness/globalization and inflation. The study's findings, however, indicate that to fully analyze this relationship, it is important to take into account implemented monetary policies. In the light of the conclusions acquired from this study, our intention for subsequent studies is to construct a model in which monetary policies are included.

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