Journal of Economics and Administrative Sciences, 25(1): 27-38, 2024
DOI: 10.37880/cumuiibf.1293144

Journal of Economics and Administrative Sciences

| esjournal.cumhuriyet.edu.tr | Founded: 2000 Available online, ISSN: 1303-1279 Publisher: Sivas Cumhuriyet Üniversitesi

The Effect of Inflation on Fund Supply of Participation Banks: An Application to Türkiye with ARDL Approach

Caner Dilber[1,a,*], Mercan Hatipoğlu[2,b]

[1] *Çankırı Karatekin University, Vocational School of Social Sciences, Çankırı/Türkiye*
[2] *Çankırı Karatekin University, Faculty of Economics and Administrative Sciences, Department of Management, Çankırı/Türkiye*
**Corresponding author*

Research Article

History

Received: 05/05/2023
Accepted: 13/10/2023

JEL Codes: G21, E44, C22

ABSTRACT

The primary economic variable that threatens price stability is inflation. Since inflation directly affects the quality of life standards of every individual living in a country, it is one of the most important problems for economies. The aim of this study is to investigate the effect of inflation on the fund supply of participation banks. The relationship between the amounts of funds offered to the market by participation banks operating in Türkiye and the Consumer Price İndex (CPI) values were analyzed at monthly frequency for the period between of 2012-2022. In order to determine the stationary of the series, the structural break ADF unit root test is used and ARDL is preferred as the estimation model. According to the results of the analysis, inflation affects negatively the fund supply of participation banks in the short term. On the other hand, a positive significant relationship between inflation and participation banks fund supply emerges in the long run. To conclude in an inflationary environment, the loans offered by the participation banks to the markets follow a U-shaped trend, first decreasing and then increasing and increases in inflation rates threaten the credit growth of participation banks. In addition, we point out that it is a necessity to bring inflation rates to a moderate level so that participation banks are not excluded from financial markets in Türkiye.

Keywords: Participation Banks, Inflation, Fund Supply, ARDL Model

Enflasyonun Katılım Bankalarının Fon Arzı Üzerindeki Etkisi: ARDL Yaklaşımı ile Türkiye Üzerine Bir Uygulama

ÖZ

Fiyat istikrarını tehdit eden temel ekonomik değişken enflasyondur. Enflasyon, bir ülkede yaşayan her bireyin yaşam standartlarının kalitesini doğrudan etkilediği için ekonomiler için en önemli sorunlardan biridir. Bu çalışmanın amacı, enflasyonun katılım bankalarının fon arzı üzerindeki etkisini araştırmaktır. Türkiye'de faaliyet gösteren katılım bankalarının piyasaya arz ettikleri fon tutarları ile TÜFE değerleri arasındaki ilişki 2012-2022 dönemi için aylık frekansta incelenmiştir. Serilerin durağanlığını belirlemek için yapısal kırılmalı ADF birim kök testi kullanılmış ve tahmin modeli olarak ARDL tercih edilmiştir. Analiz sonuçlarına göre enflasyon kısa vadede katılım bankalarının fon arzını olumsuz etkilemektedir. Diğer taraftan, enflasyon ile katılım bankaları fon arzı arasında uzun dönemde pozitif yönde anlamlı bir ilişki bulunmuştur. Sonuç olarak, enflasyonist bir ortamda katılım bankalarının piyasalara kullandırdıkları krediler U-şeklinde önce azalan, sonra artan bir seyir izlemekte ve enflasyon oranlarındaki artışlar katılım bankalarının kredi büyümesini tehdit etmektedir. Bütün bunlara ek olarak çalışmanın sonuçları Türkiye'de katılım bankalarının finansal piyasaların dışında kalmaması için enflasyon oranlarının ılımlı bir düzeye getirilmesinin gerekliliğine işaret etmektedir.

Süreç

Geliş: 05/05/2023
Kabul: 13/10/2023

JEL Kodları: G21, E44, C22

Anahtar Kelimeler: Katılım Bankaları, Enflasyon, Fon Arzı, ARDL Model

[a] *canerdilber@karatekin.edu.tr* *0000-0002-2648-925X* | [b] *mercanhatipoglu@gmail.com* *0000-0003-3307-5458*

How to Cite: Dilber C, Hatipoğlu M (2024) The Effect of Inflation on Fund Supply of Participation Banks: An Application to Türkiye with ARDL Approach, Journal of Economics and Administrative Sciences, 25(1): 27-38, DOI: 10.37880/cumuiibf.1293144

Introduction

Price stability is a prerequisite for the efficient use of resources in an economy. If firms and banks can predict the future price movements correctly, the financial market can maintain a balance supply on the funds and demand. The primary economic variable that threatens price stability is inflation. Because inflation reduces the purchasing power of the local currency, residents tend to invest their savings in foreign currency. In this case, local currency deposits in banks both decrease in amount and shorten in terms of maturity. Therefore, as banks cannot collect enough deposits, there is a shortage in the credit market. In addition, problems are experienced in the repayment of loans, as high inflation brings high uncertainties. Non-performing loans of banks accumulate and debts that cannot be collected in due time increase the resource costs of banks (Dogan & Sarsel,1996; İnan, 2000). According to Boyd *et al.,* (2001) increases in inflation rates erode the returns of not only money but all assets in the economy. Hence, banks involuntarily turn to credit rationing and make fewer loans so that the financial intermediation function is lost.

The disappearance of bank managers ability to accurately evaluate projects in the lack of price stability also contributes to this process (Tinoco-Zermeno *et al.,* 2014). In case of interest rates are not adjusted for inflation, credit supply will be adversely affected as bank costs will exceed revenues (Tan & Floros, 2012). When markets face whit extremely high inflation, the application of ceiling prices on loans or interest rates as a result of governments resorting to price controls adversely affects the banking sector (Boyd & Champ, 2006). Since the prices of goods and services are not made independently of speculation in a high inflation environment, both corporate and individual traders avoid long-run financial contracts. This makes it difficult for banks to lend and directs them to hold short-term liquid instruments on their balance sheets (Rousseau & Wachtel, 2001). Santoni (1986) claims that inflation reduces bank profitability and causes maturity mismatch problem in bank balance sheets. Demirgüç-Kunt & Detragiache (1998) states that countries with loose monetary policy went into crisis because lowering interest rates led to speculative demand for the exchange rate as a result of inflationary pressure. The forementioned studies have generally provided explanations as to why inflation may disrupt the credit mechanism. However, few studies in the literature argue that inflation leads to credit growth. For example, Chaibi & Ftiti (2015) content that as inflation rates rise, the real value of credit decreases, so there will be an increase in the demand for credit. English (1999) proves that banks make profits by taking advantage of price fluctuations in countries experiencing high inflation.

Looking at the literature so far, it is crucial to clarify the relationship between inflation and credit. Considering that participation banks are the only source of credit for individuals and companies that try to avoid interest in Türkiye, it becomes even more important to resolve the relationship between credit and inflation for participation banks. In this context, this study provides a satisfactory evidence on the linkages between inflation and the credit growth of participation banks in Türkiye.

The starting point of the study is that the Central Bank of the Republic of Türkiye (CBT) started to implement unconventional monetary policy by reducing the policy rate of 19% in September 2021 to 18% without witnessing any decreasing trend in inflation. The CBT, acting unlike other central banks, has continuously lowered the policy rate and finally, the policy rate has been 10.5% in October 2022. However, the result of cutting interest rates was not as expected, the annual consumer price index, which was 19.58% in September 2021, jumped to 80.21% in August 2022. In addition, with the inflation skyrocketing, the dollar rate, which was around 9 TL, started to hover around 18.5 TL.

How the monetary policy implemented in Türkiye differs from the traditional approach and the importance of central bank independence for the fight against inflation can be viewed in the papers of Kantur & Özcan (2022) and Demiralp & Demiralp (2019). For a long time, however, the Turkish economic authorities believed that they could win the fight against inflation by lowering interest rates. These claims are clearly stated in the section on the liraisation strategy of the CBRT's Inflation Report (2022-1). However, after the 2023 local elections, the changed economic administration returned to orthodox policies. The impact of these policies on inflation will be observed in the coming periods. All in all, we observe that increases in inflation rates threaten the credit growth of participation banks. In addition, we point out that it is a necessity to bring inflation rates to a moderate level so that participation banks are not excluded from financial markets in Türkiye.

Literature Review

Beginning with empirical literature for Türkiye, Arslan & Yaprakli (2008) show that increases in Producer Price Index reduce the conventional bank loans in Türkiye during the period between 1983-2007. But according to results of Adımlı & Telatar (2022) there is no any siginificant relationship between personal loan types and inflation in Türkiye in 2005-2020. Çatik & Karaçuka (2012) observe out that the monetary transmission mechanism works effectively only in the period of low inflation rates in Türkiye.

Following the rest of the world's literature on inflation, we come across a very broad field of research. For instance, an empirical study done by Caglayan & Xu (2016) presents evidence of negative relation between inflation volatility and the loans-to-assets ratio within the scope of 15 countries. Huang *et al.,* (2010) report that the financial sector contributes to economic growth only when inflation rates are below some thresholds level in the context of 71 countries. As noted by Kagochi (2019) inflation is a major factor which puts off the improvement of banking system of Sub-Saharan African countries. Burdekin & Tao (2011) by using survey data from People's Bank of China, prove that the fear of inflation triggers the demand for credit. Bittencourt (2011) highlights the fact that inflation had devastating effects on Brazil s financial system in the 1984-2005 period. Similar results obtained by Tinoco-Zermeño *et al.,* (2022) document that

inflation rates have negative effects on bank loans in the long run in 32 states in Mexico. According to Ayagre *et al.,* (2022) as the inflation outlook worsens, the demand for consumer and retail loans decreases. Moyo & Tursoy (2020) illustrate that inflation and the return on equity of banking in South Africa have negative correlation. Ehigiamusoe *et al.,* (2021) demonstrate the non-linear relationship between inflation and financial development in 66 countries. Bandura (2022) put forward the idea that if inflation rates are below 13%, the relationship between inflation and national income is positive in Sub-Saharan African countries. Pan & Wang (2022) argue that banks with low liquidity ratios are more affected by inflation and unemployment rates. According to empirical studies done for small economies by Wahid *et al.,* (2011) and Batayneh *et al.,* (2021) provide evidence that the upward trends in inflation hinder the financial development both in the short and long run. On the other hand, the only study that observes a insignificant relationship between bank loans and inflation rates is by Tang (2001).

Methodology

According to Nazlıoglu *et al.,* (2013) when the variables are stationary at different levels, methods such as Engle-Granger (1987) and Johansen-Juselius (1990) cannot be used. For this reason, the Auto Regressive Distributed Lag (ARDL) model developed by Pesaran & Shin (1999) is used in the study, which allows accurate estimations when the explanatory variables are I(0) and I(1). Trend variable is added to the models due to the trend feature of the variable total amount of financing provided by participation banks (LNFON). The ARDL model established for the co-integration relationship is written as in equation (1) (Tabash *et al.,* 2022).

$$\begin{aligned}\Delta\mathrm{LNFON}_{\,t} = {} & a_0 + \delta_1 \mathrm{LNCPI}_{\,t-1} \\ & + \delta_2 \mathrm{LNFON}_{\,t-1} + \delta_3 DU18 \\ & + \sum_{i=0}^{\rho} \beta_1 \, \Delta LN\mathrm{CPI}_{t-1} \\ & + \sum_{i=0}^{\rho} \beta_2 \, \Delta FON_{\,t-1} \\ & + \sum_{i=0}^{\rho} \beta_2 \, \Delta DU18_{\,t-1} \\ & + TREND_t + \varepsilon_t\end{aligned} \tag{1}$$

where

LNFON: Total amount of financing provided by participation banks

LNCPI: Consumer price index

DU18: Dummy variable

TREND: Trend

ε_t: Residual component

The dummy variable is added to the model that 1 (DU18=1) for after 2018M1 that ADF test break date and 0 for before. The co-integration relationship between the variables is tested with the F-test for the null hypothesis $H0{:}\theta1{=}\theta2{=}\theta3$ (Narayan, 2005). First of all, the lag length should be determined by establishing the VAR model. The eleventh lag is appropriate according to all information criteria except Schwarz. After this stage, the lag lengths are released and the model is estimated again in order to calculate the long and short term coefficients. The equation for the long run ARDL (p, p, p) model, which is established by releasing the lag lengths, is established as follows (Tabash *et al.,* 2022).

$$\begin{aligned}\mathrm{LNFON}_{\,t} = {} & \beta_0 + \beta_1 \sum_{i=1}^{\rho} \beta_1 \, LNFON_{\,t-1} \\ & + \sum_{i=0}^{\rho} \beta_2 \, LNCPI_{\,t-1} \\ & + \sum_{i=0}^{\rho} \beta_3 \, DU18_{\,t-1} \\ & + trend_t + \varepsilon_t\end{aligned} \tag{2}$$

The expression p in the equation represents the lag lengths for the dependent and independent variables. In the model with $\dot{I}_{max}$ = 12, ARDL (11, 12, 11) is determined as the most suitable model according to Akaike Information Criteria. The calculation of the coefficients of the short-term relationship in ARDL models is based on the error correction model. The coefficient for the error correction model, which is expected to be negative and significant in the model, shows how many periods after an imbalance can be corrected in the short-term (Karagöl et al., 2007). The error correction model to be established for calculating the coefficients of the short-term relationship is written as in equation (3) (Tabash, *et al.,* 2022).

$$\begin{aligned}\Delta\mathrm{LNFON}_{\,t} = {} & \beta_0 + \sum_{i=1}^{\rho} \beta_1 \, \Delta LNFON_{\,t-1} \\ & + \sum_{i=0}^{\rho} \beta_2 \, \Delta LNCPI_{\,t-1} \\ & + \sum_{i=0}^{\rho} \beta_3 \, \Delta DU18_{\,t-1} \\ & + \theta ECT_{t-1} + trend_t + \varepsilon_t\end{aligned} \tag{3}$$

When testing for unit root in time series, ignoring the breaks in the series can lead to misleading results. Unit root tests with structural break take into account the structural break in the series, while testing the unit root according to the break date (Nazlıoğlu, 2011). ADF test has formed the basis of searching for unit root with structural break (Çağlar, 2015). Zivot & Andrew (1992) proposed a structural break unit root test based on the ADF test strategy, which considers the breakpoints that are externally evaluated in the Perron test as internal elements and determines the break with internal attributes rather than constants. The authors propose three different models based on the Perron test;

$$Model\ 1{:}\ y_t = \mu + dD(T_B)_t + y_{t-1} + \varepsilon_t \tag{4}$$

$$Model\ 2{:}\ y_t = \mu_1 + y_{t-1} + (\mu_2 - \mu_1)DU_t + \varepsilon_t \tag{5}$$

$$Model\ 3{:}\ y_t = \mu_1 + y_{t-1} + dD(T_B)_t + (\mu_2 - \mu_1)DU_t + \varepsilon_t \tag{6}$$

Equation (4) permits an exogenous change in the level of series, equation (5) allows an exogenous change in the rate of trend, equation (6) admits both changes (Zivot & Andrew, 1992). According to the authors, when the external factors

are internalized, the regression equations are as follows (Zivot & Andrew, 1992; Gezer & Kılıc, 2020).

$$Model\ 1': y_t = \mu + \beta_t + ay_{t-1} + \theta_1 DU(\varphi) + \sum_{i=1}^{k} c_i \Delta y_{t-i} + \varepsilon_t \quad (7)$$

$$Model\ 2': y_t = \mu + \beta_t + ay_{t-1} + \theta_2 DU(\varphi) + \sum_{i=1}^{k} c_i \Delta y_{t-i} + \varepsilon_t \quad (8)$$

$$Model\ 3': y_t = \mu + \beta_t + ay_{t-1} + \theta_2 DU(\varphi) + \theta_1 DU(\varphi) + \sum_{i=1}^{k} c_i \Delta y_{t-i} + \varepsilon_t \quad (9)$$

Equation (7) shows the break for models with constant. Equation (8) shows the break for models with trend. Equation (9) shows the break for models with both constant and trend. ε_t is the non-autocorrelated error term with normal distribution. T_B is the break point and is determined by trimming from the beginning and end of the series as λ=T_B/T, $\lambda \in$ [0,10;0,90] (Esenyel, 2017). If the t-statistic, calculated after the break date is determined, is greater than the absolute value of the ADF critical value, the existence of the unit root is rejected on structural break (Yılancı, 2009).

Results and Discussion

Total financing data of participation banks were obtained from the official database of TKBB[1] and CPI figures regarding inflation were obtained from the official database of the Central Bank. As one of the variables is a percentage and the other is a quantity, the series are included in the model in logarithmic form and the inflation series are seasonally and calendar adjusted. First, this paper evaluated statistical features and pre-estimation tests. Tables 1and 2 show the results of descriptive statistics and correlation matrix. LNFON and LNCPI non-normal distribution while LNFON variable has a left skewed and flattened structure. When the standard deviation values are examined, the volatility of the LNFON is higher than LNCPI. There are 111 observations for both variables.

The correlation matrices of the variables are shown in Table 2. Correlation between LNFON and LNCPI There is a correlation of about 39%. Table 3 show the results of the structural break ADF unit root test for LNFON at level. The t-statistics values for break models at the level and level and trend are greater than the ADF test statistical values at a %1 significance level. According to this result, the LNFON variable is stationary at the level I(0). There is single break in the series, and the break date is determined as 2018M1.

Tables 4 and 5 show the results of the structural break ADF unit root test for LNCPI at level and first difference. The t-statistics values for break models at the level and level and trend are smaller than the ADF test statistical values at a %1 significance level. According to this result, the LNCPI variable is non-stationary at the level. But the LNCPI variable is stationary at the first difference I(I). As a result, the dependent variable LNFON stationary at the level but independent variable LNCPI stationary at the first difference. Since the variables are stationary at different levels, it is decided to use the ARDL model in the study.

Table 1. Descriptive Statistics
Çizelge 1. Tanımlayıcı İstatistikler

	LNFON	LNCPI
Mean	3,739030	5,816205
Median	4,025352	5,738538
Maximum	4,709530	6,684524
Minimum	0,000000	5,362371
Std. Dev.	0,932741	0,323312
Skewness	-1,555006	0,517804
Kurtosis	5,505430	2,329238
Jarque-Bera	73,76578	7,041124
Probability	0,000000	0,029583
Sum	415,0323	645,5988
Sum Sq. Dev.	95,70058	11,49840
Observations	111	111

Source: Author's own

Table 2. Correlation Matrix
Çizelge 2. Korelasyon Matrisi

	LNFON	LNCPI
LNFON	1	-0,t392801
LNCPI	-0,392801	1

Source: Author s own

[1] Participation Banks Association of Türkiye

Table 3. Unit Root with Break Test on LNFON

Çizelge 3. LNFON için Yapısal Kırılmalı Birim Kök Testi

Variables						
	Model 1: Break at the Level					
	Single Break ADF (Z, A,, 1992)		t-Statistic	Lag Lenght	Break Date	I(d)
	1%	-5,347598	-10,71118***	12	2018M1	I(0)
	5%	-4,859812				
	10%	-4,607324				
LNFON	**Model 3: Break at the Level and Trend**					
	Single Break ADF (Z, A,, 1992)		t-Statistic	Lag Lenght	Break Date	I(d)
	1%	-5,719131	-32,42066***	12	2018M1	I(0)
	5%	-5,175710				
	10%	-4,893950				

Source: Author's own Not: *, **, *** imply that the series is stationary at 10%, 5%, and 1% respectively. Lags were selected based on Akaike info criteria

Table 4: Unit root with break test on LNCPI

Çizelge 4. LNCPI için Yapısal Kırılmalı Birim Kök Testi

	Model 1: Break at the Level					
Variables	Single Break ADF (Z, A,, 1992)		t-Statistic	Lag Lenght	Break Date	I(d)
	1%	-5,347598	-1,226571	4	2021M11	-------
	5%	-4,859812				
	10%	-4,607324				
LNCPI	**Model 3: Break at the Level and Trend**					
	Single Break ADF (Z, A,, 1992)		t-Statistic	Lag Lenght	Break Date	I(d)
	1%	-5,719131	-1,165798	4	2021M8	-------
	5%	-5,175710				
	10%	-4,893950				

Source: Author's own. Not: Lags were selected based on Akaike info criteria

Table 5: Unit root with break test on LNCPI (firs difference)

Çizelge 5. LNCPI için Yapısal Kırılmalı Birim Kök Testi (birinci fark)

	Model 1: Break at the Level					
Variables	Single Break ADF (Z. A., 1992)		t-Statistic	Lag Lenght	Break Date	I(d)
	1%	-5,347598	-9,586921***	3	2021M11	I(I)
	5%	-4,859812				
	10%	-4,607324				
LNCPI	**Model 3: Break at the Level and Trend**					
	Single Break ADF (Z. A., 1992)		t-Statistic	Lag Lenght	Break Date	I(d)
	1%	-5,719131	-9,022562***	1	2021M2	I(I)
	5%	-5,175710				
	10%	-4,893950				

Source: Author's own. Not: *, **, *** imply that the series is stationary at 10%, 5%, and 1% respectively. Lags were selected based on Akaike info criteria

Table 6: ARDL Bound Test

Çizelge 6. ARDL Sınır Testi

		Signif	I(0)	I(1)
P	F-Statistic	10%	4,307	5,223
11	16,25349	5%	5,067	6,103
		1%	6,73	8,053
	Diognastics Tests			
	X^2_{Norm}		0,739 [0,690]	
	X^2_{LM}		1,139 [0,326]	
	X^2_{BPG}		1,563 [0,059]	

Source: Author's own. Not: X^2_{Norm} Jarque-Bera test detects normal distribution, X^2_{LM} Breush-Godfrey test detects autocorrelation problem and X^2_{BPG} Breush-Pagan-Godfrey test detects varying variance.

Table 6 shows the results of ARDL bound test. According to the bound test the F-Statistics value calculated for the model is higher than the lower and upper limit values even at the %1 significance level. In this case, the null hypothesis which indicates that there is no co-integration relationship between the variables is rejected. It can be said that there is a long run co-integration relationship between the variables for the model.

Table 7. ARDL (11, 12, 11) Model Result and the Long-run Coefficients
Çizelge 7. ARDL (11, 12, 11) Model Sonucu ve Uzun Dönem Katsayıları

Variable	Coefficient	Standard Error	t-Statistic	Prop*
LNFON(-1)	0,406720	0,107877	3,770215	0,0004***
LNFON(-2)	0,141054	0,101470	1,390114	0,1695
LNFON(-3)	-0,220482	0,092086	-2,394315	0,0197**
LNFON(-4)	-0,213914	0,089549	-2,388785	0,0200**
LNFON(-5)	0,243664	0,083658	2,912622	0,0050***
LNFON(-6)	-0,204656	0,078956	-2,592033	0,0119**
LNFON(-7)	0,083858	0,076858	1,091070	0,2795
LNFON(-8)	0,289327	0,067881	4,262242	0,0001***
LNFON(-9)	-0,137669	0,075306	-1,828140	0,0724*
LNFON(-10)	0,056139	0,054395	1,032063	0,3061
LNFON(-11)	0,105889	0,023620	4,483003	0,0000***
LNCPI	-0,338898	0,480070	-0,705935	0,4829
LNCPI (-1)	-0,172614	0,882964	-0,195493	0,8457
LNCPI (-2)	0,201603	0,998479	0,201910	0,8407
LNCPI (-3)	-0,308491	1,355530	-0,227580	0,8207
LNCPI (-4)	-0,275312	1,668432	-0,165012	0,8695
LNCPI (-5)	0,946947	1,687724	0,561079	0,5768
LNCPI (-6)	-1,474594	1,733782	-0,850507	0,3984
LNCPI (-7)	2,251998	1,776303	1,267800	0,2097
LNCPI (-8)	-1,433065	1,741081	-0,823089	0,4137
LNCPI (-9)	0,317628	1,597715	0,198802	0,8431
LNCPI (-10)	-0,503128	1,468853	-0,342531	0,7331
LNCPI (-11)	1,054583	1,302406	0,809719	0,4212
LNCPI (-12)	1,803510	0,915950	1,969005	0,0535*
DU18	-0,044531	0,051928	-0,857563	0,3945
DU18(-1)	-4,720268	0,065996	-71,52405	0,0000***
DU18(-2)	2,575825	0,511393	5,036881	0,0000***
DU18(-3)	0,786567	0,506579	1,552703	0,1257
DU18(-4)	-1,023361	0,466121	-2,195484	0,0319**
DU18(-5)	-0,788298	0,456611	-1,726411	0,0893*
DU18(-6)	1,967403	0,431474	4,559730	0,0000***
DU18(-7)	-0,769477	0,428380	-1,796250	0,0774*
DU18(-8)	-0,024836	0,425484	-0,058372	0,9536
DU18(-9)	1,364594	0,375612	3,632986	0,0006***
DU18(-10)	-1,170376	0,395976	-2,955676	0,0044***
DU18(-11)	0,842627	0,284934	2,957270	0,0044***
C	-9,070236	3,223127	-2,814110	0,0066***
TREND	-0,008200	0,003539	-2,317375	0,0239**
		Diognastics Tests		
	R^2		0,998	
	$\bar{R}^2$		0,997	
	X^2_{Norm}		2,486 [0,288]	
	X^2_{LM}		0,266 [0,767]	
	X^2_{BPG}		1,622 [0,046]	
		Lon-run Coefficients		
Variable	Coefficient	Standard Error	t-Statistic	t-Statistic
LNCPI	4,599	0,816	5,633	0,000***
DU18	-2,231	0,1987	-11,313	0,000***

Source: Author s own Not: X^2_{Norm} Jarque-Bera test detects normal distribution, X^2_{LM} Breush-Godfrey test detects autocorrelation problem and X^2_{BPG} Breush-Pagan-Godfrey test detects varying variance. *, **, *** imply that the series is stationary at 10%, 5%, and 1% respectively.

Table 8. Short-term and Error Correction Coefficients
Çizelge 8. Kısa Dönem ve Hata Düzeltme Katsayıları

Variable	Coefficient	Standard Error	t-istatistik	Prop*
D(LNFON(-1))	-0,143209	0,087652	-1,633829	0,1074
D(LNFON(-2))	-0,002155	0,082462	-0,026130	0,9792
D(LNFON(-3))	-0,222637	0,079207	-2,810812	0,0066***
D(LNFON(-4))	-0,436551	0,077194	-5,655276	0,0000***
D(LNFON(-5))	-0,192888	0,069737	-2,765928	0,0075***
D(LNFON(-6))	-0,397544	0,068102	-5,837491	0,0000***
D(LNFON(-7))	-0,313686	0,060845	-5,155480	0,0000***
D(LNFON(-8))	-0,024359	0,061024	-0,399175	0,6912
D(LNFON(-9))	-0,162028	0,058662	-2,762051	0,0076***
D(LNFON(-10))	-0,105889	0,022692	-4,666363	0,0000***
D(LNCPI)	-0,338898	0,412504	-0,821563	0,0414**
D(LNCPI (-1))	-2,581678	0,624870	-4,131546	0,0001***
D(LNCPI (-2))	-2,380076	0,634725	-3,749771	0,0004***
D(LNCPI (-3))	-2,688567	1,036569	-2,593718	0,0119**
D(LNCPI (-4))	-2,963879	0,967731	-3,062708	0,0033***
D(LNCPI (-5))	-2,016932	1,050914	-1,919218	0,0596*
D(LNCPI (-6))	-3,491526	1,091217	-3,199662	0,0022***
D(LNCPI (-7))	-1,239528	1,125219	-1,101589	0,2750
D(LNCPI (-8))	-2,672593	1,003689	-2,662771	0,0099***
D(LNCPI (-9))	-2,354965	0,963554	-2,444042	0,0174**
D(LNCPI (-10))	-2,858093	0,849858	-3,363025	0,0013***
D(LNCPI (-11))	-1,803510	0,842905	-2,139636	0,0364**
D(DU18)	-0,044531	0,047945	-0,928796	0,3567
D(DU18(-1))	-3,760667	0,135943	-27,66356	0,0000***
D(DU18(-2))	-1,184842	0,438105	-2,704474	0,0089***
D(DU18(-3))	-0,398275	0,447500	-0,890001	0,3770
D(DU18(-4))	-1,421637	0,406938	-3,493498	0,0009***
D(DU18(-5))	-2,209934	0,376335	-5,872256	0,0000***
D(DU18(-6))	-0,242531	0,338990	-0,715453	0,4771
D(DU18(-7))	-1,012008	0,327997	-3,085416	0,0031***
D(DU18(-8))	-1,036845	0,261466	-3,965504	0,0002***
D(DU18(-9))	0,327749	0,260911	1,256173	0,2138
D(DU18(-10))	-0,842627	0,261003	-3,228419	0,0020***
C	-9,070236	1,232596	-7,358642	0,0000***
TREND	-0,008200	0,001190	-6,892501	0,0000***
ETC(-1)*	-0,450072	0,061202	-7,353862	0,0000***

Source: Author s own. Not: *, **, *** imply that the series is stationary at 10%, 5%, and 1% respectively.

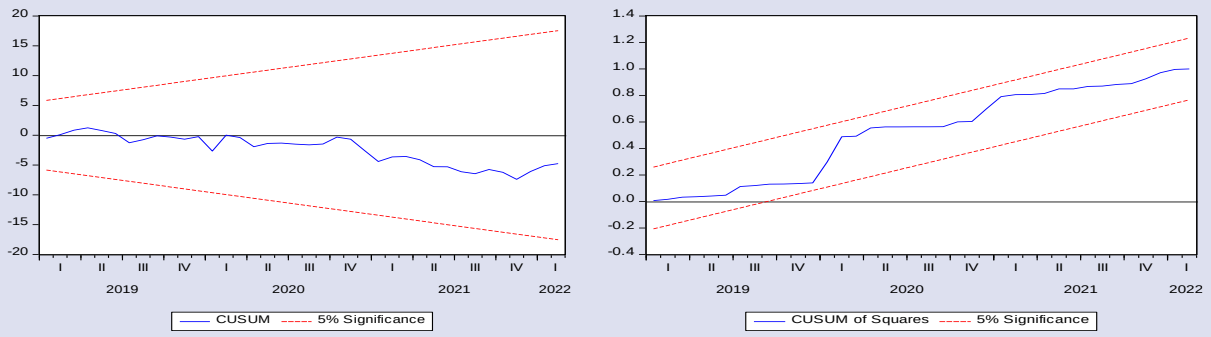

Figure 1. CUSUM and CUSUM-Q Charts
Şekil 1. CUSUM ve CUSUM-Q Grafikleri

Source: Author s own

Diagnostic tests show that there is no auto-correlation and varying variance problems in the model, and there is a normal distribution.

Table 8 shows the short-term and error correction coefficients of the model. Results show that there is a negative and significant relationship between the total financing offered by participation banks and inflation in the short-term. In other words, inflation causes a decrease in the financing of participation banks in the short term. According to this result, which the opposite of long run results, participation banks follow a policy of preventing real losses that may occur by reducing their short-term financing in an inflationary environment. The error correction coefficient (ETC) of the model is negative and significant as expected. According to the coefficient, an imbalance that occurs in the short-term can be corrected after 2 periods ($1/0.45 \cong 2.2$). Finally figure 1 shows CUSUM and CUSUM-Q charts. There is no instability in the parameter values during the relevant period and the estimations are stable.

Conclusion

In this study, the market funding reflex of participation banks in an inflationary environment has been investigated. The results emerges show that the relationship between the amount of funds offered by participation banks in Türkiye and inflation differs in the short and long term. A negative relationship was found between the amount of funds supplied to the market by participating banks and inflation in the short run. Some of the previous studies claim that inflation disrupts the credit mechanism due to reasons such as high uncertainty, increase in non-performing loans, loss of ability of bank managers to evaluate projects correctly, maturity mismatch in bank balance sheets, and that there is a negative relationship between loans and inflation. (Santoni, 1986; Dogan & Sarsel,1996; İnan, 2000; Rousseau & Wachtel, 2001; Boyd et al, 2001; Arslan & Yaprakli, 2008; Tan & Floros, 2012; Tinoco-Zermeno et al,. 2014; Tinoco-Zermeño *et al.,* 2022). The short-term results of this study are in parallel with the studies mentioned. In addition, the fact that the interest policy in Türkiye has been determined independently of inflation in recent years has deepened this situation.

On the other hand, according to the long-term results of the study, there is a long-term positive relationship between the amount of funds offered to the markets by participation banks and inflation in Türkiye. High inflation and inflation expectations decrease the real value of loans and increase the demand for loans (Burdekin & Tao, 2011; Chaibi & Ftiti, 2015). Participation banks can respond to this demand in the long run. Despite high inflation in the long run, the most important reason why participation banks increase their fund supply may be the irrational expansionary monetary policies implemented by the policy makers through state banks in order to eliminate the destructive effect of inflation and expand the shrinking credit volume. Participation banks and conventional banks other than public banks have to adapt to new conditions in order to compete in the market and continue their activities.

Inflation rates in Türkiye, which were single digits in 2016, reached double digits in 2017. Inflation, the effect of which started to be felt more deeply in 2018, increased continuously until 2022 with the Covid-19 pandemic. ADF test with structural break results also pointed to a downward break in the fund supply of participation banks in January 2018. Participation banks reacted to inflation and inflation expectations as of the beginning of the year and constriction their fund supply.

When all the results obtained in the study are evaluated together, it can be said that the funding reflex of participation banks in an inflationary environment is to reduce the fund supply at the first stage and to try to respond to the high fund demand in the long term. If the high loan need cannot be met by financial intermediaries such as conventional and participation banks in the long term, the country will face the danger of deflation.

New studies, in which variables such as profit rates, deposits, total assets, liquid assets, capital ratios, number of customers, banking technologies, and banking performance indicators that affect the fund supply of participation banks are taken into account, will shed light on a clearer understanding of the fund supply of participation banks in an inflationary environment.

Extended Abstract

The primary economic variable that threatens price stability is inflation. Since inflation directly affects the quality of life standards of every individual living in a country, it is one of the most important problems for economies. Therewithal because inflation reduces the purchasing power of the local currency, residents tend to invest their savings in foreign currency. In this case, local currency deposits in banks both decrease in amount and shorten in terms of maturity. Therefore, as banks cannot collect enough deposits, there is a shortage in the credit market. Difficulties in accessing credit also bring about a contraction in both investment and consumption expenditures. In addition, problems are experienced in the repayment of loans, as high inflation brings high uncertainties. Since the prices of goods and services are not made independently of speculation in a high inflation environment, both corporate and individual traders avoid long-run financial contracts. This makes it difficult for banks to lend and directs them to hold short-term liquid instruments on their balance sheets. Looking at the literature so far, it is crucial to clarify the relationship between inflation and credit. Considering that participation banks are the only source of credit for individuals and companies which try to avoid interest in Türkiye, it becomes even more important to resolve the relationship between credit and inflation for participation banks. In this context, our study provides a satisfactory evidence on the linkages between inflation and the credit growth of participation banks in Türkiye. How the monetary policy implemented in Türkiye differed from the

traditional approach and the importance of central bank independence for the fight against inflation can be viewed in the paper of some researchers. For a long time, however, the Turkish economic authorities believed that they could win the fight against inflation by lowering interest rates. These claims are clearly stated in the section on the liraisation strategy of the CBRT's Inflation Report (2022-1). However, after the 2023 local elections, the changed economic administration returned to orthodox policies. The impact of these policies on inflation will be observed in the coming periods.

The aim of this study is to investigate the effect of inflation on the fund supply of participation banks. The relationship between the amount of funds offered to the market by participation banks operating in Türkiye and the CPI values are analyzed at monthly frequency for the period between of 2012-2022. In order to determine the stationary of the series, the structural break ADF unit root test was used and ARDL is preferred as the estimation model. According to the results of the analysis, inflation affects the fund supply of participation banks negatively in the short term. On the other hand, a positive significant relationship between inflation and participation banks fund supply emerges in the long run. All in all, we observe that increases in inflation rates threaten the credit growth of participation banks. In addition, we point out that it is a necessity to bring inflation rates to a modarate level so that participation banks are not excluded from financial markets in Türkiye. Some of the previous studies claim that inflation disrupts the credit mechanism due to reasons such as high uncertainty, increase in non-performing loans, loss of ability of bank managers to evaluate projects correctly, maturity mismatch in bank balance sheets, and that there is a negative relationship between loans and inflation. (Santoni, 1986; Dogan & Sarsel,1996; İnan, 2000; Rousseau & Wachtel, 2001; Boyd et al, 2001; Arslan & Yaprakli, 2008; Tan & Floros, 2012; Tinoco-Zermeno et al,. 2014; Tinoco-Zermeño *et al.,* 2022). The short-term results of this study are in parallel with the studies mentioned. In addition, the fact that the interest policy in Türkiye has been determined independently of inflation in recent years has deepened this situation. On the other hand, according to the long-term results of the study, there is a long-term positive relationship between the amount of funds offered to the markets by participation banks and inflation in Türkiye. As a result in an inflationary environment, the loans offered by the participation banks to the markets follow a U-shaped trend, first decreasing and then increasing. High inflation and inflation expectations decrease the real value of loans and increase the demand for loans (Burdekin & Tao, 2011; Chaibi & Ftiti, 2015). Participation banks can respond to this demand in the long run. Despite high inflation in the long run, the most important reason why participation banks increase their fund supply may be the irrational expansionary monetary policies implemented by the policy makers through state banks in order to eliminate the destructive effect of inflation and expand the shrinking credit volume. Participation banks and conventional banks other than public banks have to adapt to new conditions in order to compete in the market and continue their activities.

Inflation rates in Türkiye, which were single digits in 2016, reached double digits in 2017. Inflation, the effect of which started to be felt more deeply in 2018, increased continuously until 2022 with the Covid-19 pandemic. ADF test with structural break results also pointed to a downward break in the fund supply of participation banks in January 2018. Participation banks reacted to inflation and inflation expectations as of the beginning of the year and constriction their fund supply. When all the results obtained in the study are evaluated together, it can be said that the funding reflex of participation banks in an inflationary environment is to reduce the fund supply at the first stage and to try to respond to the high fund demand in the long term. The fact that participation banks increase their long-term fund supply, either to adapt to new conditions or to seek profit, shows that participation banks in Türkiye act in parallel with conventional banks in terms of loan supply. If the high loan need cannot be met by financial intermediaries such as conventional and participation banks in the long term, the country will face the danger of deflation.

New studies, in which variables such as profit rates, deposits, total assets, liquid assets, capital ratios, number of customers, banking technologies, and banking performance indicators that affect the fund supply of participation banks are taken into account, will shed light on a clearer understanding of the fund supply of participation banks in an inflationary environment.

Katkı Oranları ve Çıkar Çatışması / Contrıbutıon Rates and Conflicts of Interest

Etik Beyan	Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.	**Ethical Statement**	It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited
Yazar Katkıları	Çalışmanın Tasarlanması: CD (%70), MH (%30) Veri Toplanması: CD (%25), MH (%75) Veri Analizi: CD (%90), MH (%10) Makalenin Yazımı: CD (%80), MH (%20) Makale Gönderimi ve Revizyonu: CD (%90), MH (%10)	**Author Contributions**	Research Design: : CD (%70), MH (%30) Data Collection: CD (%25), MH (%75) Data Analysis: CD (%90), MH (%10) Writing the Article: CD (%80), MH (%20) Article Submission and Revision: CD (%90), MH (%10)
Etik Bildirim	iibfdergi@cumhuriyet.edu.tr	**Complaints**	iibfdergi@cumhuriyet.edu.tr
Çıkar Çatışması	Çıkar çatışması beyan edilmemiştir.	**Conflicts of Interest**	The author(s) has no conflict of interest to declare.
Finansman	Bu araştırmayı desteklemek için dış fon kullanılmamıştır.	**Grant Support**	The author(s) acknowledge that they received no external funding in support of this research.
Telif Hakkı & Lisans	Yazarlar dergide yayınlanan çalışmalarının telif hakkına sahiptirler ve çalışmaları CC BY-NC 4.0 lisansı altında yayımlanmaktadır.	**Copyright & License**	Authors publishing with the journal retain the copyright to their work licensed under the CC BY-NC 4.0.

References

Adımlı, T. & Telatar, O. M. (2022). Bireysel kredi türlerinin tüketici fiyat endeksine etkisi: Türkiye ekonomisi üzerine ampirik bir çalışma, *Finansal Araştırmalar ve Çalışmalar Dergisi,* Vol.14 No. 26, pp. 1-17.

Arslan, İ. & Yaprakli, S. (2008). Banka kredileri ve enflasyon arasindaki ilişki: Türkiye üzerine ekonometrik bir analiz (1983-2007), *Istanbul University Econometrics and Statistics e-Journal*, Vol. 0 No.7, pp. 88-103.

Ayagre, P., Dzeha, G., Kriese, M. & Kusi, B. (2022). What drives bank lending? A closer look at bank lending types in Africa, *African Journal of Economic and Management Studies.* Vol. 13 No. 2, pp. 236-250.

Bandura, W. N. (2022). Inflation and finance-growth nexus in Sub-Saharan Africa, *Journal of African Business*, Vol. 23 No. 2 pp. 422-434.

Batayneh, K., Al Salamat, W. & Momani, M. Q. (2021). The impact of inflation on the financial sector development: Empirical evidence from Jordan, *Cogent Economics & Finance*, Vol. 9 No. 1.

Bittencourt, M. (2011). Inflation and financial development: Evidence from Brazil, *Economic Modelling*, Vol. 28 No. 1-2, pp. 91-99.

Boyd, J. H. & Champ, B. (2006). Inflation, Banking, and Economic Growth , *Federal Reserve Bank of Cleveland, Economic Commentary*, pp.1-4.

Boyd, J. H., Levine, R. & Smith, B. D. (2001). The impact of inflation on financial sector performance, *Journal of Monetary Economics*, Vol. 47 No. 2, pp.221-248.

Burdekin, R. C. & Tao, R. (2011). Bank lending, inflation, and China s stock market (2004–2010), *Economics Research Internationa.* Vol. 2011, pp. 1-7.

Çağlar, A. E. (2015). *Yapısal kırılmalı birim kök testlerinin küçük örneklem özelliklerinin karşılaştırılması* (Master s thesis, Pamukkale University Institute of Social Sciences).

Çatik, A. N. & Karaçuka, M. (2012). The bank lending channel in Turkey: has it changed after the low-inflation regime?. *Applied Economics Letters*, *19*(13), 1237-1242.

Caglayan, M. & Xu, B. (2016). Inflation volatility effects on the allocation of bank loans, *Journal of Financial Stability,* Vol. 24, pp. 27-39.

Chaibi, H. & Ftiti, Z. (2015). Credit risk determinants: Evidence from a cross-country study, *Research in International Business and Finance*, Vol. 33, pp. 1-16.

Çatik, A. N. & Karaçuka, M. (2012). The bank lending channel in Türkiye: has it changed after the low-inflation regime?, *Applied Economics Letters*, Vol. 19 No. 13, pp. 1237-1242.

Demiralp, S. & Demiralp, S. (2019). Erosion of central bank independence in Türkiye, *Turkish Studies,* Vol. 20 No. 1, pp. 49-68.

Demirgüç-Kunt, A. & Detragiache, E. (1998). The determinants of banking crises in developing and developed countries, *IMF Economic Review,* Vol. 45 No. 1, pp. 81-109.

Dogan, S. & Sarsel, Y. (1996). *Enflasyonun bankacılık sektörü üzerine etkileri ve Türk bankacılık sektörüne bir bakış* . Türkiye Bankalar Birliği: Ankara.

Ehigiamusoe, K. U., Narayanan, S. & Poon, W. C. (2021). Revisiting the role of inflation in financial development: unveiling non-linear and moderating effects, *Asia-Pacific Journal of Business Administration,* Vol. 14 No. 3, pp. 380-401.

Engle, R. F. & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica*, 251-276.

English, W. B. (1999). Inflation and financial sector size, *Journal of Monetary Economics*, Vol. 44 No. 3, pp. 379-400.

Esenyel, N.M. (2017). Türkiye de enerji yakınsama hipotezinin sınanması: Yapısal kırılmalı birim kök analizi, *Social Sciences Research Journal*, Vol. 6 No. 3, pp. 42-52.

Gezer, M.A. & R. Kılıc (2020). Türkiye'de finansal istikrarın reel ekonomiye etkisi: Doğrusal ve doğrusal olmayan ARDL modellemelerine dayalı olarak, *Sosyoekonomi,* Vol. 28 No. 46, pp.117-140.

Huang, H. C., Lin, S. C., Kim, D. H. & Yeh, C. C. (2010). Inflation and the finance–growth nexus, *Economic Modelling*, Vol. 27 No. 1, pp. 229-236.

İnan, E. A. (2000). Dezenflasyon programının Türk bankacılık sistemine olası etkileri, *Bankacılar Dergisi*, Vol. 32, pp. 1-17.

Johansen, S. Juselius, K., (1990), Maximum likelihood estimation and inferences on cointegration with application to the demand for money, *Oxford Bulletin of Economics and Statistics*. 52, 169-210.

Kagochi, J. (2019). Inflation and financial sector development in Sub-Saharan African countries, *Journal of Economic Studies,* Vol. 46 No. 4, pp. 798-811.

Kantur, Z. & Özcan, G. (2022). Dissecting Turkish inflation: theory, fact, and illusion, *Economic Change and Restructuring*, Vol. 55 No. 3, pp. 1543-1553.

Karagöl, E., Erbaykal, E. & Ertuğrul, H.M. (2007). Türkiye de ekonomik büyüme ile elektrik tüketimi ilişkisi: Sınır testi yaklaşımı, *Doğuş University Journal*, Vol. 8 No. 1, pp. 72-80.

Moyo, D. & Tursoy, T. (2020). Impact of inflation and exchange rate on the financial performance of commercial banks in South Africa, *Journal of Applied Economic Sciences*, Vol. 10 No. 69, pp. 626-635.

Narayan, P.K. (2005). The saving and investment nexus for China: Evidence from cointegration tests, *Applied Economics*, 37(17), 1979-1990.

Nazlioglu, Ş., Kayhan S. & Adıguzel, U. (2013). Electricity consumption and economic growth in Türkiye: Co-integration and nonlinear Granger Causality, *Economics, Planning, and Policy*, Vol. 9 No. 4, pp. 315-324.

Nazlioglu, Ş. (2011). World oil and agricultural commodity prices: Evidence from nonlinear causality , *Energy Policy*, Vol. 39 No. 5, pp. 2935-2943.

Pan, H. & Wang, C. (2022). Determinants of bank lending: is there a threshold effect? , *Applied Economics Letters*, pp. 1-4.

Pesaran M.H. & Shin Y. (1999). *An autoregressive distributed lag modeling approach to co-integration analysis*, In: Strom, S., Holly, A., Diamond, P. (Eds.), Centennial Volume of Rangar Frisch, Cambridge University Press, Cambridge.

Rousseau, P. L. & Wachtel, P. (2001). *Inflation, financial development and growth. In economic theory, dynamics and markets,* Springer, Boston, MA pp. 309-324.

Santoni, G. J. (1986). The effects of inflation on commercial banks , *Federal Reserve Bank of St. Louis Review*, Vol. 68 No. 3, pp. 15-26.

Tabash, M. I., Abdulkarim, F. M., Akinlaso, M. I. & Dhankar, R. S. (2022). Islamic banking and economic growth: Fresh insights from Nigeria using autoregressive distributed lags (ARDL) approach, *African Journal of Economic and Management Studies,* Vol. 13 No. 4, pp. 582-597.

Tan, Y. & Floros, C. (2012). Bank profitability and inflation: the case of China, *Journal of Economic Studies*, Vol. 39 No. 6, pp. 675-696.

Tang, T. C. (2001). Bank lending and inflation in Malaysia: Assessment from unrestricted error-correction models, *Asian Economic Journal*, Vol. 15 No. 3, pp. 275-289.

Tinoco-Zermeno, M. Á., Torres-Preciado, V. H. & Venegas-Martínez, F. (2022). Inflation and bank credit, *Investigación Administrativa*, Vol. 51 No. 129, pp. 1-21.

Tinoco-Zermeno, M. A., Venegas-Martínez, F. & Torres-Preciado, V. H. (2014). Growth, bank credit, and inflation in Mexico: evidence from an ARDL-bounds testing approach, *Latin American Economic Review*, Vol. 23 No. 1, pp. 1-22.

Wahid, A. N., Shahbaz, M. & Pervaz, A. Z. İ. M. (2011). Inflation and financial sector correlation: The case of Bangladesh, *International Journal of Economics and Financial Issues*, Vol. 1 No. 4, pp. 145-152.

Yılancı, V. (2009). Yapısal kırılmalar altında Türkiye için işsizlik histerisinin sınanması, *Doğuş University Journal,* Vol. 10 No. 2, pp. 324-335.

Zivot, E. & Andrews, D.W. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis, *Journal of Business & Economic Statistics*, Vol. 10 No. 3, pp. 251-270.