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The Effect of Household versus Enterprise Credit on Economic Growth in Türkiye

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ABSTRACT

The motivation of this study is the significant growth of the Turkish economy in credit volume over the past two decades. Although theoretical predictions suggest distinct impacts of household and enterprise credit on the economy, the empirical literature has predominantly relied on aggregate indicators of total bank lending to the private sector. Only a few studies have examined the impact of credit composition on economic growth concerning the credit source. Despite the significant expansion of credit volume, this specific issue has not been previously investigated in the context of Türkiye. Therefore, this study aims to empirically assess the effects of total bank credit on the private sector as well as enterprise (or business) and household credit markets on economic growth. The empirical study is based on a time series approach called ARDL cointegration to reveal the long and short-run relationships between related variables. An annual time series data from 1986 to 2021 is applied for Türkiye. Empirical results show that enterprise credit has a positive impact on economic growth, whereas household credit does not affect economic growth. The findings also show that the total amount of banking credit given to the private sector does not affect economic growth. Furthermore, it is presented that there is a two-way causality for enterprise credit and economic growth in the short and long-run. The lending structure determines how much financial development impacts economic growth. Our findings explain that it is not relevant how much money financial institutions lend, but to whom and for what purposes it is lent is quite significant in Türkiye.

Keywords: Financial Development, Economic Growth, Household Credits, Enterprise Credits

Türkiye'de Hanehalkı ve İşletme Kredilerinin Ekonomik Büyümeye Etkisi

Süreç

Geliş: 22/07/2023
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Bilgi

Bu çalışma Betül İsmiç tarafından Sedef Şen danışmanlığında tamamlanan yüksek lisans tezinden türetilmiştir.

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ÖZ

Bu çalışmanın motivasyonu Türkiye ekonomisinin son yirmi yılda kredi hacminde kaydettiği önemli büyümedir. Teorik öngörüler hanehalkı ve işletme kredilerinin ekonomi üzerindeki farklı etkilerine işaret etse de ampirik literatür ağırlıklı olarak özel sektöre verilen toplam banka kredi göstergelerine dayanmaktadır. Kredi kompozisyonunun ekonomik büyüme üzerindeki etkisini kredi kaynağı açısından inceleyen az sayıda çalışma bulunmaktadır. Kredi hacmindeki önemli genişlemeye rağmen, bu özel konu daha önce Türkiye bağlamında araştırılmamıştır. Bu sebeple, bu çalışma, özel sektör üzerindeki toplam banka kredisinin yanı sıra girişimci (veya işletme) ve hane halkı kredi piyasalarının ekonomik büyüme üzerindeki etkilerini ampirik olarak değerlendirmeyi amaçlamaktadır. Ampirik çalışma, ilgili değişkenler arasındaki uzun ve kısa dönemli ilişkileri ortaya çıkarmak için ARDL eş bütünleşme adı verilen bir zaman serisi yaklaşımına dayanmaktadır. Türkiye için 1986'dan 2021'e kadar yıllık zaman serisi verileri uygulanmıştır. Ampirik sonuçlar, işletme kredisinin ekonomik büyüme üzerinde olumlu bir etkiye sahip olduğunu, hane halkı kredisinin ise ekonomik büyümeyi etkilemediğini göstermektedir. Bulgular ayrıca özel sektöre verilen toplam banka kredisi miktarının ekonomik büyümeyi etkilemediğini göstermektedir. Ayrıca, kısa ve uzun vadede işletme kredisi ve ekonomik büyüme arasında iki yönlü bir nedensellik ilişkisi olduğu ortaya konmuştur. Kredilendirme yapısı, finansal gelişmenin ekonomik büyümeyi ne kadar etkileyeceğini belirler. Bulgularımız, Türkiye'de finansal kuruluşların ne kadar borç verdiğinin değil, kime ve hangi amaçlarla borç verdiğinin önemli olduğunu ortaya koymaktadır.

Anahtar Kelimeler: Finansal Gelişme, İktisadi Büyüme, Hane halkı kredileri, İşletme Kredileri

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Introduction

While researchers offer different answers to why countries grow economically at different levels, a recent focus has been on the role of the financial system (FS) in economic growth (EG). The manner of the link between the development of FS and EG is quite clear; developed countries have developed FS. Therefore, policies to improve FS are expected to increase EG (Khan and Senhadji, 2003). A significant number of empirical studies assess the impact of the functioning of the FS on EG. However, many studies examine financial development as a whole and neglect to analyze the individual effects of its components.

A better understanding of how FS promotes EG can be achieved by decomposing overall bank lending into its constituent parts. Credit composition and how it affects EG can provide insight into why countries grow economically at different levels. The fact that enterprise credit (EC) and household credit (HC) have different influences on growth may be of great relevance to policymakers looking to maximize the outcomes of policies in the financial sector on the real economy (Beck et al., 2012). Moreover, countries can determine whether EC or HC has a greater impact on EG.

Several reasons make it important to explore the composition of private credit (PC) in emerging countries. Firstly, the effects of the increased level of HC in emerging economies remain unclear. In one sense, better access to credit helps credit-constrained households smooth out their consumption; on the other hand, it increases spending and declines saving. In addition, higher levels of total PC are not necessarily correlated with higher levels of credit extended to enterprises. A rise in HC as a percentage of total PC can potentially prevent investment, especially in developing countries where stock markets are not well developed to facilitate investment (Büyükkarabacak and Krause, 2009). The two types of credit appear to have fundamental differences in their dynamics, and their impact on EG is expected to differ. Understanding credit composition and its effects on EG allows us to comprehend the tie between financial development (FD) and EG better. This study aims to find the impact of EC and HC separately on EG to identify which types of credits are more effective in promoting EG.

In the context of Türkiye, exploring this link is of particular interest. Firstly, the banking sector in Türkiye is essential for credit to enterprises and households. The size of EC to GDP in Türkiye rose between 1990 and 2020 and peaked at 89.6 % in 2021. Similarly, the size of HC to GDP in Türkiye rose between 1990 and 2020 and peaked at 17.5 % in 2020. Secondly, Türkiye attracted large amounts of foreign capital at relatively low costs because of the 2008 global crisis. When Türkiye became abundant in foreign resources, making it possible for Turkish residents to benefit from those resources through the credit provided by banks. As the Turkish economy has come across swift credit growth in recent years, and as the ratio of credit to GDP has risen, the power of credit to influence macroeconomic variables has also increased. Thus, this study was inclined to investigate credit composition in more detail and to pay greater attention to it in the coming years. Thirdly, in Türkiye, studies analyzing the influence of bank credit on EG have largely focused on overall bank credit. Notably, few studies examine the link between credit types and EG. This study aims to reveal the disaggregated influence of private sector credit in households and enterprises on the EG of Türkiye. In that sense, this study aims to fill the gap in the literature on finance-EG by examining the disaggregated private credit to GDP.

The paper is organized as follows: Section 2 presents a brief theoretical and literature review. Section 3 describes the data and variables. Section 4 shows the econometric methodology. Section 5 concludes.

A Brief Theoretical and Literature Review

Credit generally refers to the rights or opportunities banks grant to private or legal individuals based on law or internal regulations and policies (Erdem, 2014). A large portion of the funds collected by banks are extended as credits by banks. The amount and maturity of the credit are determined according to the investor's demand. It is common practice to discuss credit composition in terms of the distribution of two types of credit across banks in the economy. The two main categories of credits are ECs (working capital credits, project credits, and open credits) and consumer credits (installment credits, mortgage credits, auto credits, etc.) (Günal, 2010).

EC is an important tool to meet a company's small volume, short-run financing, and long-run capital needs. A large number of companies make long-run credit agreements with their banks and use credits within the limits set by the bank for a specified period of time (Tunay, 2005). Consumer credit is defined as credit individuals or households use to purchase goods and services unrelated to investment or productive activities (Mengüç, 2017). The provision of consumer credits allows consumers to meet their various needs in a timely manner, supports consumption, stimulates the economy, and ensures the sustainability of depositors' savings (Bayar and Varışlı, 2020).

Credit plays a vital role in alleviating liquidity constraints among individuals and companies, easing consumption, and meeting the financing needs of the real sector, especially in developing countries, at a lower cost through the provision of credit (Demirezen, 2015). Credit availability to households and enterprises has been enhanced by improved risk assessment and pricing of risk, increased lending to households without strong collateral, the increasing securitization of loans, and the emergence of markets for riskier corporate debt. Credit usage may contribute to a diminution in economic volatility by reducing the sensitivity of household and business spending to changes in income and cash flow. Hence, negative shocks would be less likely to trigger fluctuations. However, a greater level of borrowing may also contribute

to increased volatility by enabling households and businesses to buy capital goods more rapidly when their target stocks of those goods escalate (Dynan et al., 2006).

It is of great importance that the FS is robust, that there is a large credit volume, and that this is reflected in the volume of credit and contributes to EG (Özen and Vurur, 2013). When financial or economic crises strike, a majority of developed countries use expansionary monetary policies to promote consumption and investment. Real interest rates are lowered not only to increase inflation but also to increase credit demand. In most countries, using credit to finance investment and consumption is considered one of the most significant driving forces for the economy and the consumer (Irandoust, 2021). On the other hand, when bank credit is rapidly expanded to the private sector, macroeconomic stability may be affected by stimulation of aggregate demand in excess of potential output and overheating, as bank lending fuels consumption and/or import demand, which has an impact on the external current account balance, inflation, and currency stability. As the current account deficit worsens, it may subsequently result in the reduction of external credit lines and foreign liquidity, thus deteriorating the condition of the banking system and triggering a full-blown economic and financial crisis (Hilbers et al., 2005).

A bank credit channel describes how monetary policy practices affect aggregate demand in the economy, and thus GDP, by affecting credit volume (Togan and Berument, 2011). Bernanke and Blinder's study (1992) is one of the first to examine the bank credit channel comprehensively. The study argues that banks can extend credit to customers who might not otherwise be able to get credit in the open market due to the expertise they have acquired in evaluating credit applicants and monitoring loan performance. By reducing reserves and loans, the Federal Reserve reduces spending by customers who depend on bank credit, and thus, aggregate demand also falls. In this way, a new channel has been opened for Federal Reserve policy to reach the real economy in a more targeted manner.

An infinite number of empirical research have been performed regarding the tie between bank credit and EG[1]; however, a small number of studies have analyzed the influence of the composition of the credit on EG concerning the source of credit. In their study, Beck et al. (2012) disentangled the influence of HC and EC on growth systematically for the first time, making it one of the most comprehensive studies of its kind. They used data from 45 developed and developing countries from 1994 to 2005. It has been found in the study that EC stimulates EG, whereas HC does not. The findings of the study by Sassi and Gasmi (2014), which investigated 27 countries using dynamic GMM, are also in line with the findings of the study by Beck et al. (2012). The study by Arcand et al., (2015) differs from other studies because they calculate a threshold effect, which depends on the non-monotonic tie between credit composition and EG. The findings suggest that growth is maximized when HC reaches 50% of GDP and firm credit to 80 % of GDP. Bezemer et al., (2016) distinguished HCs as consumer and mortgage credits. They found that EC is not statistically significant, and the coefficient of mortgage credit is negative. Leon (2016) used an extensive data set to estimate 143 countries using dynamic GMM. He asserts a negative tie connecting HC and growth, while no effect is found for EC. A study conducted by Angjelkovska et al., (2016) found a positive correlation between HC, EC, and EG in eight Southeastern European countries. Benczúr et al., (2018) employ an analysis of 23 countries from the OECD countries and the EU countries. They find that credit to households is negatively correlated with growth, while credit to non-financial corporations is positively correlated.

Majeed et al., (2019) conducted a time series analysis for Pakistan using the ARDL model. The findings confirm a positive and vital influence of EC on Pakistan's EG, while HC does not enhance EG. Another time series study is conducted by Škare et al., (2019) for Poland using Johansen cointegration. They find that HC and EC have an important role in EG in the short and long-run. Irandoust (2021) employs a panel Granger causality test for six OECD countries and finds that HC has a more prominent influence on growth than EC. As far as our best knowledge, no study investigates the tie connecting HC and EC with EG for Türkiye. Nevertheless, there are studies available that explore the correlation between financial development and economic growth in Türkiye.[2]

Data and Variables

This study is based on annual time series data from 1986 to 2021. The dependent variable is economic growth, measured as the real gross domestic product (RGDP) based on constant local currency. Five different variables are used to represent credits. EC1 is the total claims of deposit money banks on non-financial enterprises as a ratio to GDP. EC2 is the relative share of ECs in total credits. HC1 is the total claims of deposit money banks on households as a ratio to GDP. HC2 is the relative share of HCs in total credits. BC is the share of total credit to the private sector as a ratio to GDP.

Three control variables are used in the study: Government expenditure, education, and trade. General government final consumption expenditures as a share of GDP (GOV) represent all government purchases of goods and services. The gross school enrollment ratio (EDU) is the ratio of the total enrollment of secondary education, regardless of age, to the population of the age group. Exports and imports of goods and services as a percentage of GDP (TRADE) measure trade openness. RGDP, GOV, EDU and TRADE variables are acquired from World Bank

[1] See Tables A1 and A2 in the Appendix for a detailed literature review.
[2] The studies are presented in the Appendix since they only partially align with the scope and objectives of this study. See Table A3.

World Development Indicators Database, while EC1, EC2, HC1, HC2 and BC variables are taken from the Central Bank of Türkiye, comparative country statistics. All of the variables used in the model are converted into natural logarithms.

Econometric Methodology

To assess the relationship between credit types (EC1, EC2, HC1, HC2 and BC) and economic growth for Türkiye, we start from a linear function as follows in Equation (1):

$$\ln RGDP_t = \beta_0 + \beta_1 t + \beta_2 \ln CT_t + \beta_3 \ln GOV_t + \beta_4 \ln TRADE_t + \beta_5 \ln EDU_t + \varepsilon_t$$

Here, CT, t and ε represent credit types, trend[3] and error term, respectively. Each credit variable is included in the models separately. That is, five different models are estimated.

We employ the autoregressive distributed lag (ARDL) approach developed by Pesaran et al. (2001) to test for the existence of a relationship between credit types and economic growth in the long-run. Several econometrics methods were introduced in the last three decades to reveal the long-run ties among time series. Earlier procedures shown by Engle and Granger (1987), Phillips and Hansen (1990), Johansen and Juselius (1990), and Johansen (1992) have some limitations. Although Engle and Granger's cointegration method is one of the most applied empirical approaches, it is inefficient for multivariate cases. Johansen and Juselius (1990) and Johansen (1992) methods are other commonly used, more efficient procedures in multivariate systems. However, to implement both methods, all variables must be non-stationary and integrated in the same order, I (0) or I (1). The ARDL strategy has several benefits over these other strategies. First, regardless of whether the underlying regressors are purely I (0), purely I (1), or mutually cointegrated, this method tests for the existence of a relationship between variables in levels (Pesaran, Shin, and Smith, 2001). Second, it avoids serial correlation and endogeneity problems (Ghatak and Siddiki, 2001). Third, in the model under consideration, the long and short-run parameters are simultaneously estimated (Halicioglu, 2008). Finally, estimates are more efficient and consistent with small sample sizes (Narayan, 2004).

The ARDL method involves several steps. The first step is to test the stationary of the time series. The ARDL model does not allow the analyzed series to be I (2). We applied traditional Augmented Dickey-Fuller (ADF) (1981) and Phillips Perron (PP) (1988) unit root tests. The second step is the identification and analysis of structural breaks in time series. The Zivot and Andrews (ZA) unit root test determines structural breaks. The third step is testing the cointegration between the variables. Equation (1) can be written as an ARDL formula as the model with intercept and trend in Equation (2) as follows:

$$\begin{aligned}\Delta \ln RGDP_t = {} & \beta_0 + \beta_1 t + \sum_{i=1}^{l} \beta_{2i} \Delta \ln RGDP_{t-i} \\ & + \sum_{i=0}^{l} \beta_{3i} \Delta \ln CT_{t-i} \\ & + \sum_{i=0}^{l} \beta_{4i} \Delta \ln GOV_{t-i} \\ & + \sum_{i=0}^{l} \beta_{5i} \Delta \ln TRADE_{t-i} \\ & + \sum_{i=0}^{l} \beta_{6i} \Delta \ln EDU_{t-i} + \beta_7 \ln RGDP_{t-1} \\ & + \beta_8 \ln CT_{t-1} + \beta_9 \ln GOV_{t-1} \\ & + \beta_{10} \ln TRADE_{t-1} + \beta_{11} \ln EDU_{t-1} + \varepsilon_t\end{aligned}$$

The ARDL approach follows several steps. First, Equation (2) estimates with ordinary least squares to show a long-run relationship between variables. The parameters β_2-β_6 are the short-run coefficients and β_7 - β_{11} are the corresponding long-run coefficients. Joint significance of the coefficients lagged levels of variables (β_7 -β_{11}) show whether cointegration exists. According to test, null hypothesis is $H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = 0$ against the alternative hypothesis $H_1: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq \beta_{11} \neq 0$. The F test is used for the decision rule. Pesaran et al. (2001) calculated two sets of critical values for a given significance level. In one set, all variables are assumed to be I(0) (lower bound), while in the other, all variables are assumed to be I(1) (upper bound). However, Narayan (2004) and Narayan (2005) discussed that critical values obtained by Pesaran et al. (2001) are incompatible with small sample sizes. Thus, he calculated new critical values for sample sizes ranging from 30-80 observations. Considering 36 observations, it is taken into account Narayan's critical values in the present study.

There are three cases. First, if the estimated F statistic exceeds the upper bound critical value I (1), the null hypothesis will be rejected. It implies that there is a cointegration relationship among variables. Second, if the estimated F statistic is less than the lower bound critical value I (0), the null hypothesis will not be excluded. It implies that there is no cointegration link among variables. Third, if the computed F statistic falls into the bounds, then the test becomes inconclusive. Optimal lag l in Equation (2) is chosen based on model selection criteria such as Akaike (AIC) or Schwarz (SIC). The minimum information criteria imply optimal l.

If there is a cointegration, the fourth stage of the analysis estimates the coefficient of the long-run relationship determined in the third step. Long-run selected ARDL (h, z, r, k, m) model (3) as follows:

[3] From the graphical analysis of data in the study, it is found that variables in the model exhibit a linear trend pattern.

$$\ln RGDP_t = \beta_0 + \beta_1 t + \sum_{i=1}^{h} \beta_{2i} \ln RGDP_{t-i} + \sum_{i=0}^{z} \beta_{3i} \ln CT_{t-i} + \sum_{i=0}^{r} \beta_{4i} \ln GOV_{t-i} + \sum_{i=0}^{k} \beta_{5i} \ln TRADE_{t-i} + \sum_{i=0}^{m} \beta_{6i} \ln EDU_{t-i} + \varepsilon_t$$

To select lag values h, z, r, k, and m in Equation (3), model selection criteria such as AIC or SIC, as done in the third step, are used.

Finally, the error correction model (ECM) is estimated to provide for short-run coefficients of the ARDL model. Equation (4) is below:

$$\Delta \ln RGDP_t = \beta_0 + \beta_1 t + \sum_{i=1}^{l} \beta_{2i} \Delta \ln RGDP_{t-i} + \sum_{i=0}^{l} \beta_{3i} \Delta \ln CT_{t-i} + \sum_{i=0}^{l} \beta_{4i} \Delta \ln GOV_{t-i} + \sum_{i=0}^{l} \beta_{5i} \Delta \ln TRADE_{t-i} + \sum_{i=0}^{l} \beta_{6i} \Delta \ln EDU_{t-i} + +\lambda ECM_{t-1} + \varepsilon_t$$

where λ is the speed of adjustment coefficient, and ECM is the residuals provided from the estimated cointegration model of Equation (2).

ARDL cointegration approach suggests five different models defined according to their deterministic features. These five models are the model with no intercept and no trend (case I), the model with the restricted intercept and no trend (case II), the model with unrestricted intercept and no trend (case III), the model with unrestricted intercept and restricted trend (case IV), and the model with unrestricted intercept and unrestricted trend (case V). (Pesaran et al., 2001). A null hypothesis rejected by the F-bounds test does not necessarily imply the existence of cointegration. For unrestricted models (Case I, III, and V), if the F-bounds test rejects the null hypothesis, the t-bounds test approach can be employed to examine whether cointegration actually exists. The null hypothesis for unrestricted models is as follows:

$$H_0: \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = 0$$

However, the alternative hypotheses appear in three different forms as follows:

$$H_{1A}: \beta_7 = 0, \qquad \beta_8 \neq \beta_9 \neq \beta_{10} \neq \beta_{11} \neq 0$$

$$H_{1B}: \beta_7 \neq 0, \ \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = 0 \text{ and}$$

$$H_{1C}: \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq \beta_{11} \neq 0.$$

The first and second forms imply cointegration is nonsensical and degenerate, respectively. However, the third form indicates that cointegration is valid. Case V is selected to estimate our models as it is mostly used and in line with the literature.

Empirical Results

5.1. Unit root test for stationary

Selecting the most suitable unit root test can be challenging in practical applications. According to Enders (1995), employing both the ADF and PP tests as a cautious approach is recommended. When these tests support each other, it provides a higher level of confidence in the obtained results. The ADF and PP unit root test results for the intercept and intercept and trend model are shown in Table 1.

Table 1. Traditional Unit Root Test Results

	ADF				PP			
	Intercept		Intercept and Trend		Intercept		Intercept and Trend	
Variable	Level	First Diff.	Level	First Diff.	Level	First Diff.	Level	First Diff.
RGDP	0.251	-6.265	-2.446	-6.259	0.840	-6.665	-2.446	-8.353
	(0.972)	(0.000)***	(0.351)	(0.000) ***	(0.993)	(0.000)***	(0.351)	(0.000)***
EC1	0.295	-4.862	-1.890	-4.993	0.214	-4.828	-1.991	-4.952
	(0.974)	(0.000)***	(0.638)	(0.001) ***	(0.969)	(0.000)***	(0.585)	(0.001)***
EC2	-1.981	-7.125	-1.867	-7.078	-1.888	-7.320	-1.758	-7.289
	(0.293)	(0.000)***	(0.649)	(0.000)***	(0.333)	(0.000)***	(0.702)	(0.000)***
HC1	-1.821	-1.379	1.838	-2.728	-1.053	-6.224	-2.296	-6.134
	(0.362)	(0.577)	(1.000)	(0.233)	(0.722)	(0.000)***	(0.424)	(0.000)***
HC2	-1.313	-1.977	-1.337	-2.050	-1.541	-7.041	-1.779	-6.991
	(0.608)	(0.294)	(0.856)	(0.548)	(0.501)	(0.000)***	(0.693)	(0.000)***
BC	0.129	-4.034	-3.007	-4.045	-0.025	-3.946	-2.081	-3.958
	(0.963)	(0.003)***	(0.144)	(0.016)***	(0.948)	(0.004)***	(0.537)	(0.020)**
GOV	-2.932		-2.616	-5.712	-3.099		-2.276	-5.710
	(0.051)*		(0.275)	(0.000)***	(0.035)**		(0.435)	(0.000)***
EDU	-1.811	-5.434	-1.542	-5.672	-1.811	-5.434	1.588	-5.672
	(0.369)	(0.000)***	(0.795)	(0.000)***	(0.369)	(0.000)***	(0.773)	(0.000)***
TRADE	-1.331	-5.377	-3.593		-0.934	-6.154	-2.801	-5.862
	(0.604)	(0.000)***	(0.045)**		(0.765)	(0.000)***	(0.206)	(0.000)***

Note: 1%, 5%, and 10% significance levels are indicated by the symbols ***, **, and *, respectively. Probability values are given within the parentheses. ADF unit root test uses Schwarz information criteria, while the PP test uses the Barlett Kernell estimation method.

The results show that RGDP, EC1, EC2, and BC are non-stationary at the level and stationary at their first differences. However, the remaining variables show mixed stationary types depending on model selection and unit root tests. Overall, the ARDL model is applicable under these circumstances since the series presents I (0) or I (1).

A structural break occurs when an economic crisis, war, policy change, natural disaster, sudden shocks etc., happens.[4] If the series has a structural break, traditional unit root tests can detect a stationary series as non-stationary (Çağlar and Mert, 2019, p.125). To prevent this problem, we use ZA structural break unit root test. The results are presented in Table 2.

The null hypothesis is that the series does not have structural breaks, while the alternative hypothesis is that the series is stationary with structural breaks which occur at an unknown time. The results indicate that the HC2 variable has a structural break in models A, B, and C for 1993 and 2005 break times. Therefore, a dummy variable is introduced and included when the HC2 variable is a dependent variable in the ARDL model.

Cointegration

Five models with five different credit indicators are estimated to assess the effect of credit types on economic growth. This approach was chosen to control the influence of each credit variable separately on economic growth. The summary results of bound tests are presented in Table 3.

The calculated F statistical values exceed the upper critical values, except for model 5, thus rejecting the null hypothesis that cointegration does not exist. It appears that the series are cointegrated based on the bounds test with F statistics, but it is imperative to check the results of the t-bound test to ensure that this cointegration is valid. The calculated t statistics are greater than the upper critical values for all levels of significance for models 1 and 2. It confirms the validity of the cointegration link between enterprise credit and economic growth. In other words, no cointegration exists between HC1, HC2 and BC variables and RGDP.

Long-Run Elasticities

The fourth stage of the analysis is to estimate the coefficients of the long-run relationship determined in the previous step. The results are reported in Table 4.

Table 2. Structural Break Unit Root Test Results

	Model A (Intercept)			Model B (Trend)			Model C (Both)		
Sig. Level	1%	5%	10%	1%	5%	10%	1%	5%	10%
Critical Value	-5.34	-4.93	-4.58	-4.80	-4.42	-4.11	-5.57	-5.08	-4.82
Variable	t-Statistic								
RGDP	-3.765 (1999)			-3.957(2002)			-4.310 (1999)		
EC1	-3.036 (1998)			-2.858(2004)			-3.727(2002)		
EC2	-3.396(1999)			-3.418(2009)			-4.542(2004)		
HC1	-4.278(1993)			-3.997(2010)			-3.887(2010)		
HC2	-5.248(1993)**			-4.480(2005)**			-4.986(1993)*		
BC	-3.966(2008)			-3.228(2003)			-3.568(2008)		

Table 3. ARDL Cointegration Test Results

Models	Cointegration hypotheses	ARDL	F – Stat.	t – Stat.	Result
Model 1	$F(RGDP_t \mid EC1_t, GOV_t, EDU_t, TRADE_t)$	ARDL (4,0,4,2,4)	7.239***	-4.963***	Cointegration
Model 2	$F(RGDP_t \mid EC2_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (4,0,2,0,1)	7.071***	-4.921***	Cointegration
Model 3	$F(RGDP_t \mid HC1_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (4,3,2,3,4)	5.235***	-1.979	No Cointegration
Model 4	$F(RGDP_t \mid HC2_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (4,4,3,4,1)	8.220***	-2.951	No Cointegration
Model 5	$F(RGDP_t \mid BC_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (4,1,4,2,4)	3.264	-1.814	No Cointegration

Note: *, **, and *** represent significance at 1%, 5%, and 10%, respectively. The critical values for F bounds test from Narayan (2004) are 5.604 – 7.172; 4.036 – 5.304; 3.374 – 4.512 for 1%, 5%, and 10% significance level, respectively. The critical values for the t bounds test (-3.96) – (-4.96); (-3.41) – (-4.36); (-3.13) – (-4.04) for 1%, 5%, and 10% significance levels, respectively. The first critical value refers lower bound, while the second represents the upper bound.

Table 4. Long-Run Coefficient Tests Results

Variable	Coefficient	
	Model 1	Model 2
EC1	0.2184***-(0.0001)	-
EC2	-	0.1847*** / (0.000)
GOV	-0.4874***-(0.0003)	-0.1788* / (0.0561)
TRADE	0.0039-(0.9689)	-0.0444 / (0.3147)
EDU	0.2873**-(0.0392)	-0.2444*** / (0.0000)

[4] The structural breaks are identified when a time series' mean, trend, or both changes (Çağlar and Mert, 2019, p.125).

The long-run test results reveal that enterprise credit positively impacts economic growth. Specifically, a 1% increase in EC1 and EC2 will increase economic growth by 0.21 and 0.18%, respectively. We expected the GOV variable to have a positive sign but concluded it had a negative sign during the study period. It is possible for government expenditures to negatively affect the growth of the economy if they force the private entrepreneur out of the market, cause economic rent, and create distortions in the market. Increasing spending in the public sector but channeling this spending to less productive areas can also result in negative effects. The models show no effect of trade variables on economic growth. The effect of the education variable on economic growth is sensitive to different measures of enterprise credit. This variable is used in the model to capture the role of human capital accumulation, and the expected sign of the variable is positive, as in Model 1.

Diagnostics

Several diagnostic tests are required to decide whether there is serial correlation or heteroscedasticity in the residual of predicted ARDL models, as well as for specification error, normality problem, and parameter stability. If there is no diagnostic problem, it means the goodness of fit of ARDL models is met. We perform a variety of diagnostics and stability tests to achieve this goal. We applied Breusch (1978) and Godfrey's (1978) Lagrange Multiplier (LM) test for serial correlation; Ramsey's (1969) RESET test for functional form; Breusch and Pagan's (1979) test for heteroscedasticity; Jarque and Bera's (1980) test for normality. The diagnostic analyses of the models indicate no autocorrelation, heteroskedasticity, and model specification error. The normality assumption is also met. Table 5 shows the diagnostic test results.

(CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ). Figures 1 and 2 present the parameter stability test results. According to CUSUM and CUSUMSQ stability tests, all coefficients are stable.

Table 5. *Diagnostic Test Results*

Diagnostic Tests	Model 1	Model 2
Serial Correlation (Breusch-Godfrey)	2.985 / (0.1045)	1.969 / (0.1511)
Heteroskedasticity (Breusch-Pagan)	0.759 / (0.7136)	1.648 / (0.1599)
Model Specification (Ramsey-Reset):	(0.474 / (0.5050)	0.192 / (0.6659)
Normality (Jarque-Bera):	5.014 / (0.081)	0.744 / (0.6890)

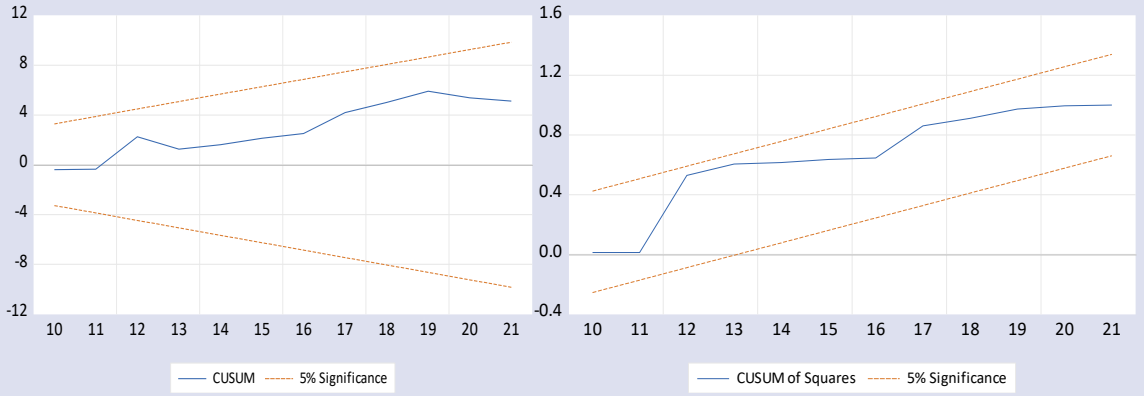

Figure 1. Model 1 CUSUM and CUSUMSQ Test Results

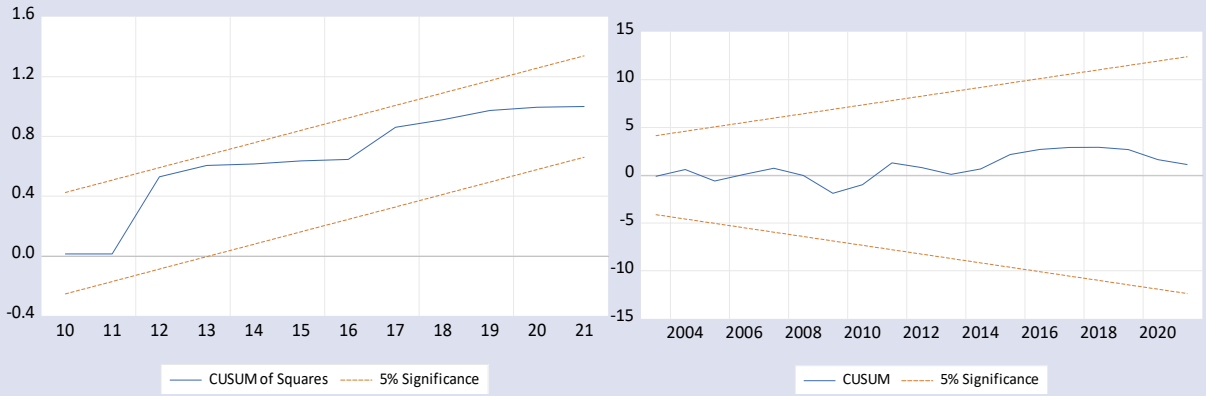

Figure 2. Model 2 CUSUM and CUSUMSQ Test Results

Short-Run Elasticities

ECM is estimated to provide for short-run coefficients of the ARDL model. The findings are presented in Table 6.

The ECM is calculated as -1.316 and -1.740 in models. These coefficients must be negative and statistically significant for the error correction mechanism to function. Based on these findings, the error correction coefficient is negative and statistically significant in both models. It is anticipated that the deviations from the short-run equilibrium will improve after a 1/|-1.316|=0.76 and 1/|-1.740|=0.57 period of time, meaning in 8 and 6months, and reaching the long-run equilibrium in models 1 and 2, respectively.

Causality

A causality relationship between two-time series may exist if part of the information contained within one is derived from another. The concept of causality must be examined from two different perspectives. The first method of obtaining causality is through the use of VAR models. The second one is causality derived through cointegration equations. The long-run and short-run causality can be determined using the error correction mechanism obtained from cointegration equations (Mert and Çağlar, 2019, p.339). Cointegration equations are used in our study to derive causality.

According to Engle and Granger (1987), the existence of at least one causality is guaranteed if there is cointegration between variables. In other words, if the variables are cointegrated, a causality analysis obtained from cointegration can be conducted. It is not possible to perform a causality analysis if a cointegration relationship does not exist. To determine one or two-way long-run causality, we conducted a bound test when credit type is dependent and economic growth is the independent variable. The results are shown in Table 7.

The findings indicate that there is cointegration between variables when EC1, EC2, and BC are dependent variables.[5] The long-run estimates of coefficients are provided in Table 8.

Since the long-run coefficients of EC1 and EC2 in models 1 and 2 and RGDP in models 6 and 7 are statistically significant, the findings suggest that there is bidirectional causality between EC1 and RGDP and EC2 and RGDP in the long-run. There is no unidirectional or bidirectional causality between other types of credit and economic growth in the long-run. ECM is found to be negative and statistically significant in the models.[6]

Table 6. Short-Run Coefficient Tests Results

Variable	Coefficient	
	Model 1	**Model 2**
$\Delta RGDP_{t-1}$	0.981*** / (0.0001)	0.868*** / (0.0001)
$\Delta RGDP_{t-2}$	0.261 / (0.1029)	1.022*** / (0.0001)
$\Delta RGDP_{t-3}$	0.732*** / (0.0006)	0.753*** / (0.0005)
ΔGOV	-0.255*** / (0.0056)	-0.176** / (0.0168)
ΔGOV_{t-1}	0.313*** / (0.0013)	0.203*** / (0.0090)
ΔGOV_{t-2}	0.274** / (0.0136)	
ΔGOV_{t-3}	0.775*** / (0.0000)	
$\Delta TRADE$	0.186*** / (0.0094)	0.189*** / (0.0079)
$\Delta TRADE_{t-1}$	0.286*** / (0.0014)	
$\Delta TRADE_{t-2}$	-0.030 / (0.5771)	
$\Delta TRADE_{t-3}$	0.434*** / (0.0001)	
ΔEDU	0.547*** / (0.0017)	
ΔEDU_{t-1}	-0.583*** / (0.0003)	
Constant	34.307*** / (0.0000)	49.167*** / (0.0000)
Trend	0.042*** / (0.0000)	0.092*** / (0.0000)
ECM_{t-1}	-1.316*** / (0.0000)	-1.740*** / (0.0000)
R^2	0.73	0.61
F Statistics	6.725*** / (0.000)	7.219*** / (0.000)

Table 7. ARDL Cointegration Test Results

Models	Cointegration hypotheses	ARDL	F – Stat.	t – Stat.	Result
Model 6	$F(EC1_t \mid RGDP_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (2,4,4,4,2)	7.778***	-4.657***	Cointegration
Model 7	$F(EC2_t \mid RGDP_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (1,4,0,2,4)	9.176***	-5.819***	Cointegration
Model 8	$F(HC1_t \mid RGDP_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (4,4,3,4,4)	9.282***	-2.245	No Cointegration
Model 9	$F(HC2_t \mid RGDP_t, GOV_t, EDU_t, TRADE_{t_t}\ Dummy)$	ARDL (4,3,3,3,3,3)	48.954***	3.237	No Cointegration
Model 10	$F(BC_t \mid RGDP_t, GOV_t, EDU_t, TRADE_{t_t})$	ARDL (2,1,4,4,0)	9.096***	-5.219***	Cointegration

[5] Since the HC2 variable has a structural break, we form a dummy variable representing the 1993 break time and included it in the cointegration model.

[6] The short-run estimation results are available upon request.

Conclusions

The Turkish economy has grown rapidly, and the amount of credit has expanded over the past twenty years, which has paved the way for this study. For the period of 1986-2021, the findings acquired in the present study, which evaluates the effects of credit composition on EG in Türkiye, differ considerably depending on exactly what type of credit is being examined. Utilizing the credits given to enterprises and households, a time series analysis is performed, and the outcomes of the models are presented.

Empirical results indicate a positive link between EC and EG, while HC does not contribute to real EG in the long-run. Furthermore, while there is a two-way causality between EC and EG in the short and long-run, there has been no causality link between HC and EG in the short or long-run. The results obtained for Türkiye are similar to many studies in literature, such as Beck et al. (2012), Sassi and Gasmi (2014), Benczúr et al. (2018), Majeed et al. (2019), Škare, Sinkovic, and Rochon (2019). Therefore, credit market development should be directed primarily to productive investments and innovations instead of HC to achieve a positive effect on EG. Regarding the context of reforms that foster the Turkish financial sector and EG, this study's findings point out that it is in the country's interest to develop financial policies concerning credit distribution. The government should support increasing the share of EC in this regard. The influences of HC are currently not evident in Türkiye, but it should be noted that increases in HC may negatively affect EG. It is imperative that monetary and fiscal authorities strictly control the proportion of credit going to the household sector.

Moreover, the study's findings show that the lending structure affects the extent and persistence of FD on EG. In other words, the lending structure determines how much FD impacts EG. For the period of 1986-2021 in Türkiye, the total amount of banking credit given to the private sector has been presented to have no effect on EG, while ECs have a positive effect. Therefore, it can be concluded that it is not relevant how much money financial institutions lend, but to whom and for what purposes it is lent is quite significant.

Several research areas can be explored in the future based on the results of this study. It is possible to extend and improve this study to review the link between bank credit activities and other macroeconomic variables in Türkiye. Furthermore, there are limitations to this study due to the lack of time series data on ECs and the inability to determine the sectors in which ECs are spent. This analysis will need to be revisited once the required data are obtained regarding sectors ECs are provided and the types of HCs, such as mortgage credits, auto credits, and consumer credits have long data.

Additionally, since traditional time series methods are employed within this study, it is possible to analyze and improve the study using more modern time series techniques.

Extended Abstract

One of the most important goals of economics, which seeks ways to meet unlimited needs with limited resources, is to build a welfare society by raising the living standards of individuals. One of the ways to raise the living standards of individuals is by increasing the per capita income level; increasing per capita income is possible by increasing production. The increase in the production of goods and services is one of the most fundamental issues that the concept of EG is concerned with. Thoughts and policies that will boost EG have always been important in economics. One of the factors that play a significant role in increasing production is capital. The effective conversion of individuals' savings into capital and investments depends on robust FSs in countries. FS maximizes efficiency while minimizing risk for savers by reducing the costs of obtaining and assessing information through financial intermediaries. An efficient FS that provides more investment in the country's economy will also accelerate EG.

The liberalization and evolution of countries' money and capital markets have made financial development an important research area. There has also been a growing interest in this field, as many influential economists of the 20th century have asserted that financial development has an impact on growth. Researchers have tried to find out whether there is an association between financial development and economic growth through both theoretical and empirical investigations.

The literature explores the link connecting financial development and the real economy, emphasizing the singular roles of entrepreneur/enterprise and household credits. Many studies in literature, however, examine financial development as a whole and neglect to analyze the individual influences of its elements. A credit composition is a measure of how bank credits are divided between enterprises and households. We will gain insight into the channels by which the financial system affects the economy through this decomposition. It is the goal of this study to investigate the link between credit composition and economic growth. It is believed that the tie connecting credit composition and growth may provide insights into the finance-growth relation.

This study looked into the short and long-term influences of credits extended to enterprises and households on economic growth in Türkiye between 1986 and 2021. A thorough examination of this link in the context of Türkiye is necessary. The Turkish economy has undergone different economic periods with different characteristics based on the changing conditions of the time and international conditions. Several factors shaped the formation and development of the FS, including the circumstances and the policies implemented as a response to the problems of the period. Identifying the current structure and governance of the Turkish FS requires a thorough understanding of its development. In the aftermath of the 2008 financial crisis, Türkiye realized large inflows of foreign capital at low costs. The

enrichment of Türkiye in terms of foreign resources enabled the residents of Türkiye to benefit from these resources through the credits given by the banks. The rapid credit growth in the Turkish economy in recent years and the increase in the ratio of credits to Gross Domestic Product have also increased the power of loans to affect various macroeconomic variables.

It is perceptible from the literature that financial development and economic growth have a strong tie, but it is noteworthy that there are relatively few studies that examine the tie connecting the type of credit and growth. The first study on the influences of credit type on various macroeconomic variables was conducted by Beck, Büyükkarabacak, Rioja, and Valev (2012). For the first time, they systematically examined the influence of household and enterprise credits on growth in one of the most comprehensive studies in this field. Researchers found that enterprise credits stimulate economic growth, while household credits do not, based on data from 45 developed and developing countries in the 1994-2005 period. This study was trailed by a limited number of studies that used panel data analysis. Time series analysis was employed in two studies by Majeed, Iftikhar, and Atiq (2019) as well as Škare, Sinkovic, and Rochon (2019). A study conducted by Majeed et al. (2019) in Pakistan using the ARDL model found that enterprise credits were positive and significant for Pakistan's economic growth, but household credits did not. In their analysis for Poland using the Johansen cointegration test, Škare et al. (2019) concluded that business and household loans have a significant influence on economic growth. There has been no study that examines the influence of credit type on economic growth using time series analysis for Türkiye.

Empirical results indicate a positive link between EC and EG, while HC does not contribute to real EG in the long-run. Furthermore, while there is a two-way causality between EC and EG in the short and long-run, there has been no causality link between HC and EG in the short or long-run. The results obtained for Türkiye are similar to many studies in literature, such as Beck et al. (2012), Sassi and Gasmi (2014), Benczúr et al. (2018), Majeed et al. (2019), Škare, Sinkovic, and Rochon (2019). Therefore, credit market development should be directed primarily to productive investments and innovations instead of HC to achieve a positive effect on EG. Regarding the context of reforms that foster the Turkish financial sector and EG, this study's findings point out that it is in the country's interest to develop financial policies concerning credit distribution. The government should support increasing the share of EC in this regard. The influences of HC are currently not evident in Türkiye, but it should be noted that increases in HC may negatively affect EG. It is imperative that monetary and fiscal authorities strictly control the proportion of credit going to the household sector.

Moreover, the study's findings show that the lending structure affects the extent and persistence of FD on EG. In other words, the lending structure determines how much FD impacts EG. For the period of 1986-2021 in Türkiye, the total amount of banking credit given to the private sector has been presented to have no effect on EG, while ECs have a positive effect. Therefore, it can be concluded that it is not relevant how much money financial institutions lend, but to whom and for what purposes it is lent is quite significant.

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