



Received: September 04, 2019
Accepted: December 30, 2019
Published Online: December 31, 2019

AJ ID: 2018.07.02.ECON.05
DOI: 10.17093/alphanumeric.641629
Research Article

Banking Sector Instability and Economic Growth: Evidence from Turkey

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ABSTRACT

The banking sector, an important component of the financial system, can affect the economic growth through raising and mobilizing the savings, channeling the funds to the productive uses and enhancing the efficiency. However, the deteriorations in the banking sector stability may negatively affect the economic growth through preventing the efficiently functioning of the aforementioned interaction channels. This study investigates the effect off banking sector instability and banking sector development on the economic growth in Turkey during August 2006-December 2018 through time series analysis. We revealed that the banking sector instability negatively affects the economic growth, but banking sector development positively affects the economic growth.

Keywords:

Banking Sector Instability, Banking Sector Development, Financial Development, Economic Growth, Time Series Analysis



1. Introduction

The development of financial system (banks, stock markets, bond markets) is suggested as a significant determinant of economic growth within the scope of endogenous growth theories. In this context, the main functions of the financial system are to generate information about potential investments and capital allocations, to monitor investments, to provide corporate governance after financing, to facilitate trading, diversification and risk management, increase and activate savings and facilitate the exchange of goods and services (Demirgüç-Kunt ve Levine, 2008). An efficient financial system may affect the economic growth positively through increasing savings, therefore investments, which are among the main determinants of economic growth, activating the savings and capital, leading the sources to the most productive investments, empowering the competition, promoting the technological development and stimulating entrepreneurship and innovation (Bagehot, 1873; Schumpeter, 1912; Goldsmith, 1969, Greenwood and Jovanovic, 1990; King ve Levine, 1993; Levine, 1997). In addition, financial intermediaries, financial instruments and markets have developed significantly during the past 40 years with the help of technological development and economic development and the contribution of liberalization and globalization processes that gained momentum since the 1980s. However, the frequency, severity and contagion of the financial crises and the ambiguity have remarkably increased with the effect of liberalization and globalization processes (Reinhart and Rogoff, 2009).

Theoretical studies and the developments in financial system led the researchers to identify the the economic effects of the development in banking sector and capital markets and the determinants of the financial development. As a result of the related empirical studies, it was concluded that the financial development represented by different variables, the development of banking sector and the development of the stock market generally affected the economic growth positively (Petkovski and Kjosevski, 2014; Durusu-Ciftci et al., 2017; Topcu and Coban, 2017; Bist, 2018; Pan and Mishra, 2018). However, many national, local and global crises have been experienced during the last 40 years; but only a few studies have been conducted on the effects of instabilities and shocks in financial system and banking sector as can be seen in the literature review. The financial stability and banking sector stability is defined as the fact that financial system or banking sector performs the function of distributing financial sources constantly, regularly and effectively (Mishkin, 1992). Therefore, the possible instabilities in financial system including banking sector may affect the economic growth negatively from the interaction channels between financing and growth. The effect of instability in banking sector on economic growth was investigated in this study in Turkey sample in order to make contributions to the limited literature.

Turkey passed to export-oriented growth model from import-substitution growth strategy and tried to integrate with the global economy along with the liberalization policies with the decisions of 24th January, 1980. The relevant structural transition also led significant developments in the financial system. In this context, Capital Markets Board was formed in 1982 and Borsa Istanbul was established in 1986 and Central Bank of the Turkish Republic began to make open market operations in 1987 and Derivatives Exchange Market was established in 2005. In addition, many crises

have been experienced during the process until today due to the shortcomings in corporate and regulatory framework. Banking Regulation and Supervision Agency was established in 2000 and with the effect of the lessons taken from the crises and the increasing fragility and the independence of the Central Bank of the Turkish Republic was reinforced following the 2001 crisis.

The development of financial sector in Turkey is mainly based on banking sector. Therefore, healthy and stable functioning of financial sector in Turkey is important for all the other components of the economy. The data about the stability of banking sector in Turkey are indicated in Table 1. As can be seen in Table 1, there is remarkable instability in the banking sector until 2002. Along with the 2001 Transition to Strong Economy Program and the institutional and legal regulations in banking sector, a relative stability was assured until 2009. However, with the effect of 2008 Global financial crisis, the debt crisis in Euro Zone and national and international economic and political problems deteriorations in stability have been experienced in banking sector as of 2009.

Year	Z Score of the Banking Sector	Rate of Non-performing Loans to Total Loans (%)	Rate of Bank Capital to Total Assets (%)
1998	5.61	6.70	8.70
1999	8.57	10.50	5.20
2000	7.45	9.20	6.10
2001	0.42	29.30	7.90
2002	5.30	12.70	11.50
2003	7.59	11.50	13.70
2004	11.30	6.50	15.00
2005	9.99	5.00	13.40
2006	8.68	3.90	11.90
2007	9.46	3.30	12.80
2008	8.00	3.40	12.10
2009	9.55	5.00	12.50
2010	9.57	3.49	12.28
2011	8.26	2.58	11.71
2012	9.36	2.74	12.10
2013	7.83	2.64	10.95
2014	8.13	2.74	11.59
2015	7.83	2.99	11.00
2016	8.07	3.11	10.73

Source: World Bank, 2019a (see Cihák et al. (2012) for detailed information about the measurement of the series)

Table 1. Banking Sector Stability in Turkey (1998-2016)

The effect of banking sector instability and banking sector development on economic growth was investigated in Turkey between August 2006 and December 2018 period through time series analysis. In this context, the related literature was outlined in the following part and the data set used in the empirical analysis and the analysis method were explained in the second part. The empirical analysis was conducted and the obtained findings were presented in the third part and the study was ended with the conclusion part.

2. Literature Review

Global and national financial markets have been expanded significantly along with the liberalization and economic globalization process and in turn the number and functions of financial intermediaries and financial instruments have changed. The rate of domestic credits to the private sector as a percent of GDP in the world raised to 104.153% in 2016 from 52.089% in 1960 (World Bank, 2019b). Furthermore, financial system may affect the economic growth positively in theory by diverting the funds from non-productive to productive uses and increasing the savings and fund mobility. The aforementioned interaction between financial system and growth has led the researchers to investigate the effects of financial system's main components (banks, pension companies, insurance institutions, stock markets, and bond markets etc.) on the economic variables such as economic growth, unemployment, tax revenues, shadow economy size, and foreign direct investments. In the empirical literature, financial development is represented by financial development index of International Monetary Fund (IMF), domestic credits to the private sector, M1, M2, M3 monetary aggregates, total assets of deposit banks, while stock market development is proxied by stock market capitalization, trading volume, and stock market turnover rate (Von Furstenberg and Fratianni, 1996; Bist, 2018; IMF, 2019).

Most of the related empirical literature has focused on finance-growth relationship and reached that the development of banking sector and the development of stock market generally affected the economic growth positively (Petkovski and Kjosevski, 2014; Ngare et al. 2014; Durusu-Ciftci et al., 2017; Topcu and Coban, 2017; Bist, 2018; Pan and Mishra; 2018). In this context, many studies have investigated the interaction between finance sector and economic growth in Turkey for different periods and revealed that financial development generally affected the economic growth positively (Bayar et al., 2014; Felek et al., 2018; Pata and Ağca, 2018). In addition, some studies using causality analysis revealed a causality from financial development to economic growth (Aslan and Küçükaksoy, 2006; Bozoklu and Yılançı, 2013); however, in some studies a causality from economic growth to financial development was found (Kar and Pentecost, 2000; Ozcan and Ari, 2011; Güneş, 2012). The empirical studies on the effect of the financial system's main components on unemployment, tax revenues, shadow economy, development of tourism sector and environment also have been conducted and they revealed that that financial development had a significant effect on the related variables (Bayar and Öztürk, 2016; Shahbaz et al., 2016; Bayar et al., 2017; Katircioğlu et al., 2018; Epstein and Shapiro, 2019).

However, a few studies were conducted to determine the economic effects of banking sector stability and revealed that banking sector stability was a significant factor for economic growth. In this context, Monnin and Jokipii (2010) analyzed the relationship between banking sector stability and economic growth in 18 OECD countries through VAR analysis and revealed that stability in banking sector affected the economic growth positively. Jayakumar et al. (2018) explored the causality relationship between the competition and stability in banking sector and economic growth in 32 European countries in 1996-2014 period through vector error correction model and reached that both the competition and stability in banking sector were the significant determinants of economic growth in the long run.

Some researchers investigated the effect of financial stability on economic growth and revealed that the deteriorations in financial stability affected the economic growth negatively (Loayza and Ranciere, 2006; Manu et al., 2011; Magkonis and Tsopanakis, 2014; Duprey et al., 2017). In this regard, Manu et al. (2011) analyzed the relationship between financial stability and economic growth in 29 African countries in 1996-2006 period using regression analysis and found that capital adequacy, liquidity and asset quality had a positive effect on economic growth in short and long run. Creel et al. (2015) investigated the relationship between financial instability and economic growth in EU sample for the period of 1998-2011 through dynamic regression analysis and discovered that financial instability affected the economic growth negatively. Nasreen and Anwar (2017) analyzed the relationship between the financial stability and economic development in 5 Southern Asian countries (Bangladesh, India, Nepal, Pakistan and Sri Lanka) using panel cointegration and causality tests and determined that financial stability was a significant determinant of economic growth and determined a one-way causality from economic development to financial stability.

Loayza and Ranciere (2006) investigated the effect of financial fragility on economic growth in 75 countries using panel data analysis and determined that financial fragility affected the economic growth negatively. Magkonis and Tsopanakis (2014) investigated the effect of financial shocks in G7 countries on economic growth using structural VAR analysis and as a result, they obtained the findings that financial shocks affected the economic growth negatively. Similarly, Duprey et al. (2017) investigated the effect of financial stress on economic growth in EU-27 countries using Markov regime switching and threshold VAR models and determined that financial stress affected economic growth negatively. Lastly, Batuo et al. (2017) analyzed the relationship between financial development, financial instability, financial liberalization and economic growth in 1985-2010 period using panel data analysis and revealed that financial development and financial liberalization increased financial instability; however, economic growth decreased financial instability.

3. Data and Method

In the research, the effect of banking sector instability and banking sector development on economic growth in Turkey during the period of August 2006 and December 2018 was investigated with monthly data using time series analysis.

3.1. Data

The economic growth was proxied by total industrial production index (2015=100), because monthly analysis was conducted in this study. Furthermore, banking sector instability was represented by the total commercial and consumer loans to be liquidated by deposit banks. On the other side, banking sector development was proxied by the credits to the private sector by deposit banks. As presented in Table 2, industrial production index was obtained from TSI (Turkish Statistical Institute) (2019) and the relevant data about banking sector was obtained from the electronic data transfer system of CBRT (Central Bank of the Turkish Republic) (2019). The logarithmic forms of the variables were used in econometric analyses. The study period was determined as August 2006 – December 2018 considering the availability of banking sector data. Instead of economic growth, industrial production index was

used because the size of sample would significantly decrease in case the monthly data were transformed to the quarterly data. EViews 10.0 and Gauss 10 software packages were used for the econometric analysis of the study.

Variables	Variable Definitions	Data source
INDS	Industrial Production Index (2015=100)	TSI (2019)
LCREDIT	Commercial and consumer loans to be liquidated by deposit banks (1,000 TL)	CBRT (2019)
PCREDIT	Loans to the private sector by deposit banks (1,000 TL)	CBRT (2019)

Table 2. Dataset Description

3.2. Method

The stationarity of the series in the study was analyzed through Narayan and Popp (2010) unit root test allowing two structural breaks. Then the cointegration relationship between variables were tested by Gregory and Hansen (1996) cointegration test allowing one structural break because the integration degrees of variables were determined as I(1). The cointegration coefficients were estimated by FMOLS (Fully Modified Ordinary Least Squares) estimator developed by Phillips and Hansen (1990). The cointegration coefficients were also estimated by DOLS (Dynamic Ordinary Least Squares) and CCR (Canonical Cointegrating Regression) methods; however, only the results obtained by FMOLS estimator was included in the study because the similar results were obtained from the other aforementioned estimators.

The Narayan and Popp (2010) unit root test is the extended version of ADF (Augmented Dickey-Fuller) unit root test to allow two endogeneously determined structural breaks. The test calculates the deterministic (d_t) and scholastic (u_t) components ($y_t = d_t + u_t$) in the models allowing structural breaks in fixed (M1) and fixed and trend (M2) 2 as follows.

$$d_t^{M1} = \alpha + \beta t + \varphi^*(L)(\theta_1 DU'_{1,t} + \theta_2 DU'_{2,t}) \tag{1}$$

$$d_t^{M2} = \alpha + \beta t + \varphi^*(L)(\theta_1 DU'_{1,t} + \theta_2 DU'_{2,t} + \gamma_1 DT'_{1,t} + \gamma_2 DT'_{2,t}) \tag{2}$$

In equations (1) and (2) ($i=1,2$), $DU'_{i,t} = 1(t > TB'_{B,i})$ indicates the structural break in constant; however, $DT'_{i,t} = 1(t > TB'_{B,i})(t - T'_{B,i})$ indicates the structural breaks in the trend. Also $T'_{B,i}$ indicates the dates of structural breaks. θ_i parameter shows the structural breaks in the constant and γ_i parameter denotes the size of structural breaks in the trend. Regression forms of M1 and M2 models are presented below. The dates of structural breaks in M1 and M2 models are determined simultaneously and consecutively. The hypothesis is conducted by comparing the t statistic of $\hat{\rho}$ parameter with the critical values generated by Monte Carlo simulations.

$$y_t^{M1} = \rho y_{t-1} + \alpha_1 + \beta^* t + \theta_1 D(T'_B)_{1,t} + \theta_2 D(T'_B)_{2,t} + \delta_1 DU'_{1,t-1} + \delta_2 DU'_{2,t-1} + \sum_{j=1}^k \beta_j \Delta y_{t-j} + e_t \tag{3}$$

$$y_t^{M2} = \rho y_{t-1} + \alpha^* + \beta^* t + \Omega_1 D(T'_B)_{1,t} + \Omega_2 D(T'_B)_{2,t} + \delta_1^* DU'_{1,t-1} + \delta_2^* DU'_{2,t-1} + \gamma_1^* DT'_{1,t-1} + \gamma_2^* DT'_{2,t-1} + \sum_{j=1}^k \beta_j \Delta y_{t-j} + e_t \tag{4}$$

Gregory and Hansen (1996) cointegration test determines the date of structural break endogeneously in the cointegrating vector and allows one structural break. The

test investigates the cointegration relationship among the variables by three different models (Model C- structural break in constant, Model C/T-structural break in constant with trend and Model C/S-regime change). The structural break in all three models is defined with the following dummy variable:

$$\varphi_{1t} = \begin{cases} 0, & \text{if } t \leq [n\tau] \\ 1, & \text{if } t > [n\tau] \end{cases} \tag{5}$$

4. Empirical Analysis

In the applied section of the paper, first the stationarity of the variables was tested by Narayan and Popp (2010) unit root test allowing two structural breaks and the results were presented in Table 3. It was determined that series included unit roots since the test statistics were smaller than the critical values; however, it was observed that the series became stationary after their first differences were taken. The dates of structural breaks determined endogenously by the test indicated that 2008 Global financial crisis and Eurozone sovereign debt crisis had significant impact on the variables in study period.

Variables	Test Statistics		Optimal Delay Length		Dates of Structural Breaks	
	M1	M2	K1	K2	M1	M2
INDS	-0.4138	-0.8310	5	0	January 2009, June 2016	November 2010, June 2016
LCREDIT	-0.02706	-0.03400	3	3	November 2013, November 2014	December 2009, November 2013
PCREDIT	-0.05292	-0.08419	4	3	November 2010, March 2011	November 2010, January 2014

Note: Critical values were taken from Narayan and Popp (2010).

Table 3. Narayan and Popp (2010) Unit Root Test Results

The cointegration relationship between industrial production index, non-performing loans and the loans to the private sector by deposit banks was tested by Gregory and Hansen (1996) cointegration test which enables one structural break and the test results were presented in Table 4. According to the cointegration results, the null hypothesis indicating that there was no cointegration between series was rejected because all of the test statistics (ADF^* , Z_τ^* ve Z_α^*) for Model C, Model C/T and Model C/S were higher than the related critical values. Therefore, there is a long term relationship between the variables. Similar to the dates of structural breaks determined by unit root test, the date of endogeneously determined structural break within cointegration test also indicates that global financial crisis and Eurozone sovereign debt crisis had significant effects on the variables in the study period.

Model	ADF*	T_b	Z_τ^*	T_b	Z_α^*	T_b
C	-4.90 (8)	10.2015	-11.40	08.2015	-139.57	08.2015
C/T	-5.48 (8)	10.2011	-11.87	08.2008	-145.29	08.2008
C/S	-5.41 (8)	09.2009	-12.44	03.2009	-152.09	03.2009
Critical Values (10%) (Critical Values were obtained from Gregory and Hansen (1996).)						
C	-4.69				-42.49	
C/T	-5.03				-48.94	
C/S	-5.23				-52.85	

Note: The values in parentheses indicate the number of delay selected by Akaike Information Criterion.

T_b indicates the dates of structural breaks.

Table 4. Gregory and Hansen (1996) Cointegration Test Results



After the cointegration relationship was determined, cointegration coefficients were estimated by FMOLS estimator developed by Phillips and Hansen (1990) and the results were presented in Table 5. When the cointegration coefficients were evaluated, it was determined that financial instability affected the industrial production negatively, but the banking sector development proxied by the loans to the private sector affected the industrial production positively. The aforementioned findings were found to be consistent with the related empirical literature. Furthermore, it exhibits the importance of the healthy functioning of the banking sector for all economic units.

Variable	Coefficients	Std. Error	t-statistics	P value
LCREDIT	-8.893112	1.958943	-4.539751	0.0000
PCREDIT	36.58000	2.869989	12.74569	0.0000
C	-489.4459	29.87653	-16.38229	0.0000

Table 5. Cointegration Coefficient Estimations

The banking sector underlies the financial system and the banks mainly mediate the transfer of savings between investors and the savers. For that reason, it is highly important that the banking sector performs its functions in the economy stably. However, when there were deteriorations in the indicators (bank Z score, non-performing loans, bank capital) reflecting the stability in banking sector with the effect of national or international economic problems and the financial crises, some failures in the fund transfer between investors and savers by banks can be experienced and the banks may act more conservatively in loaning process. These related issues may also affect the economic growth negatively through the channels of consumption and investments.

Short term analysis was conducted with the differenced series by FMOLS method and the one-lagged value of the error term obtained from the cointegration analysis and the analysis results were presented in Table 6. The error correction term was found to be negative and statistically significant. Therefore, 26% of the deviations in the short term is eliminated in each term and the variables converge to the equilibrium value in long term.

Dependent Variable	ECT_{t-1}	$\Delta TASF$	$\Delta KREDI$
$\Delta INDS$	-0.262 (0.000)	-0.623 (0.000)	1.466 (0.000)

Table 6. Short Term Analysis Results

5. Conclusion

A remarkable increase in transnational fund transfer through financial markets and in the number of financial intermediaries and tools have been experienced along with the momentum in liberalization and globalization in the last four decades. Banks are the leaders of financial sectors especially in emerging market economies and developing countries. Banks can directly or indirectly affect the economic growth by increasing the savings, directing the funds to relatively more productive investments and by their control functions after the financing. However, the liberalization and the globalization processes raised the volatility in financial system and frequency and severity of financial crises. Therefore, it has become more difficult to assure stability in financial system and banking sector as compared to the past.

In this study, we explored the effect of banking sector instability and the development of banking sector on economic growth in an emerging market of Turkey during the period of August 2006 – December 2018 using monthly data. As a result of the analysis, it was determined that the banking sector instability affected the economic growth negatively in long term; however, the development of banking sector affected the economic growth positively in long term. The findings of the study were found to be consistent with the related limited empirical literature. In this context, the institutional and economic measures that will help the banking sector to fulfill its functions effectively and stably will also support the long term growth. The future studies can be focused on the possible determinates of the banking sector instability and in turn will be beneficial for determining the institutional and economic measures to be taken for banking sector performing its functions effectively and stably.

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