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DOES BANK PROFITABILITY PROMOTE ECONOMIC GROWTH AND VICE VERSA? PANEL CAUSALITY EVIDENCE FROM THE SELECTED COUNTRIES

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Abstract

Banks, which have an important role in the country economies, increase the amount of savings and capital accumulation by bringing together those who supply and demand funds in the economy, and this increase contributes positively to economic growth and employment through the resource transfer function of banks. The ability of banks to function properly depends largely on their profitability levels, and banks with desired profitability levels are expected to have a positive effect on economic growth. Therefore, it is important to conduct more empirical studies in terms of determining the profitability of banks and the relationship between this profitability level and economic growth, which are of vital importance in national economies. At this point, the purpose of this study is to determine the causal relationship between bank profitability and economic growth across eight selected countries, including Argentina, Brazil, Chile, Croatia, India, Poland, Russia, and Turkey. Panel causality test is applied to examine the so-called causality relationship by considering the period of 2009-2018. The empirical findings have shown that bank profitability in the selected developing countries (Chile, Poland, Turkey and Russia) promotes the economic growth. To the best of our knowledge, this study provides an in-depth insight into by considering several countries and using panel causality test to study the relationship between bank profitability and economic growth.

Keywords: *Bank Profitability, Economic Growth, Panel Causality.*

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1. INTRODUCTION

Commercial banks try to maximize their profits and expand their market shares. As such, commercial banks, like other businesses, have similar expectations regarding the health of the economy. When there is a consensus among businessmen that the future will be promising, businesses will expand their operations. Otherwise, entrepreneurs will follow a path that limits their investment expansion. While commercial banks expand their loans during the expansion period of the economy, they will contract in the recession periods of the economy. At this point, industrialists criticize banks for their low risk and want them to take risks at least as much as they do. During the recovery period of the economy, commercial banks contribute to the money stock and thus help to expand the demand for goods and services. When the economy reaches full employment, credit and deposit expansion no longer increases employment and real income, but increases the general level of prices. On the other hand, if banks cut their loans during periods when the economy starts to decline, there may be significant declines in total demand and production due to the decline in real prices. Therefore, the contribution of the commercial banking system to economic growth and stability depends largely on the resources and use of bank funds. In order to facilitate growth, banks' funding sources need to grow. In order to help maintain economic stability, bank transactions should not exacerbate economic fluctuations. However, when banks act with a profit motive, they may cause the destabilization of the economy. If banks fail to access expanding funding sources, their profits will remain low (Parasiz, 1997: 148-149).

The banking sector enables the collection of funds and savings needed for economic growth and thus the emergence of new initiatives in most sectors. These increased savings have a positive effect on capital accumulation, ensuring economic growth and job creation through the credit mechanism. But on the other hand, the relationship between the banking sector and economic growth is not always in the same direction. The recent financial crises have negatively affected this relationship, and the development of technology and global economic relations has increased the speed at which these crises spread. For example, as a result of the 2008 global financial crisis, almost all countries increased their control over the banking sector and took new measures to address this situation. Additionally, the relationship between the banking sector and growth is extremely important for all countries, and the direction or degree of this relationship may vary. In some cases, it is stated that the development of the banking sector causes growth; in others, the growth causes the development of the banking sector. In addition, it is possible to express that growth and the banking sector have mutual interaction, or that

economic growth and bank profitability do not affect each other, or even that the banking sector limits growth (Turgut and Ertay, 2016: 120). In order to determine which of these relationships exist, this study attempts to analyze the relationship between the economic growth and bank profitability, by using panel Granger Causality test.

The rest of this study is organized as follows: Section 2 overview the related literature. Section 3 and 4 presents the empirical model and data. The empirical findings and concluding remarks are reported in sections 5 and 6 respectively.

2. LITERATURE REVIEW

Much empirical literature shows that economic growth is the major factor that determines bank profitability in different ways. At this point, it is possible to say that the related literature divides whether economic growth affects bank profitability into two categories: in a positive or negative way:

Tan and Floros (2012) attempted to link bank profitability and economic growth from 2003 to 2009 by using a sample of 101 Chinese banks. The application of generalized method of moments provided evidence in support of the fact that there is a negative relationship between GDP growth and bank profitability, measured as ROA and NIM.

Obamuyi (2013) did a research on the factors affecting profitability of 20 Nigerian banks over the period of 2006-2012. Return on assets (ROA) was employed as the bank profitability. As for the independent variables; bank capital, bank size and expenses management were considered as bank-specific variables, while interest rate and real GDP growth were used as macroeconomic determinants. According to panel data analysis results; it was seen that both bank-specific variables and macroeconomic determinants had a positive effect on bank profitability.

Trujillo-Ponce (2013) sought to find out the determinants of bank profitability, measured as return on assets (ROA) and return on equity (ROE), for the period of 1999-2009. In the study several banks-specific variables as to the asset structure, financial structure, asset quality, capitalization, efficiency, size and revenue diversification as well as the industry and macroeconomic variables such as industry concentration, economic growth, inflation and interest rates were considered as the explanatory variables. Using generalized method of moments (GMM) estimator method, the study concluded that there was a positive relationship between economic growth and bank profitability.

Javid (2016) examined the internal (bank-specific) and external (macroeconomic) determinants of bank profitability over the period of 2006-2013. Using a sample of 34 commercial banks operating in Pakistan, ROA was used as the bank profitability indicator, while bank size, deposit, liquidity, non-interest income, annual inflation rate, GDP growth rate and real interest rate were considered as the independent variables. Panel data regression analysis results showed that bank size and non-interest income had a positive impact on bank profitability, while deposit had negative impact. Additionally, it was observed that macroeconomic indicators did not have any effect on bank profitability.

Ozturk's (2016) study also found that there was a positive relationship between GDP growth rate and bank return on assets (ROA) and return on capital (ROC) for the period of 1970-2014. Using a sample of Turkish depository banks, Prais-Winsten and Newey-West regression models were employed and the empirical findings also showed that inflation had no significant effect on ROA and ROC, while deposit interest rates and inflation positively affected net interest margin.

Alev (2018) also examined the long-term relationship between bank profitability and economic growth of Turkish banks by applying Classical Engle Granger Cointegration and Granger Causality test over the period of 1992-2017. In the study, growth rate in GDP was considered as the growth variable, while ROA and ROE were employed as the bank profitability indicators. The empirical results showed that bank profitability, both ROA and ROE positively affected economic growth.

Klein and Weill (2018) conducted a research entitled 'Bank Profitability and Economic Growth' and analyzed a total of 132 countries for the period of 1999-2013. ROA was measured as bank profitability indicator and the real GDP per capita growth was employed for economic growth. The empirical findings supported the fact that bank profitability had a positive impact on economic growth, but that the so-called impact was short-lived.

A study by *Isik and Kambay (2019)*, on the bank-specific and macro-economic determinants of bank profitability indicated that operating efficiency, exchange rate, bank size, assets management, inflation rate, and interest rate were the main determinants of bank profitability, measured as ROA and ROE.

The panel data analysis method was used by *Moussa and Hdidar (2019)* to examine the relationship between bank profitability and economic growth for the sample of 18 Tunisian banks from 2000 to 2017. ROA and ROE were considered as bank profitability indicators, while

several bank-specific variables, growth rate of GDP and inflation rate were used as the independent variables. As a result of the study, they concluded that there was a positive relationship between economic growth and bank profitability.

3. RESEARCH METHOD

In this study, economic growth and bank profitability were evaluated within the scope of panel causality analysis for the annual data of 8 selected countries (Argentina, Brazil, Chile, Croatia, India, Poland, Russia, and Turkey) for the period of 2009-2018. When the relevant literature is examined, it is seen that Gross Domestic Product (GDP) is included in the analysis in different ways such as the GDP growth rate, per capita GDP, the real GDP per capita growth, growth in real GDP and lnGDP (*Demirguc-Kunt and Huizinga, 1999; Tan and Floros, 2012; Obamuyi, 2013; Trujillo-Ponce, 2013; Javid, 2016; Ucler and Uysal, 2017; Alev, 2018; Klein and Weill, 2018; Moussa and Hdidar, 2019*). In this study, the GDP per capita is used as the economic growth variable and return on assets (ROA) is used as the bank profitability indicator. The variables used in the study have been obtained from the World Bank and Bloomberg data terminal. In addition, Gauss 10 and Stata 15 programs have been used to obtain the estimation results in the study.

Table 1: Summary Statistics

Country	Variable	Obs	Mean	Std. Dev.	Min	Max
Chile	GDP	10	1.898	2.468	-2.601	5.057
	ROA	10	1.446	0.16	1.16	1.718
Poland	GDP	10	3.536	1.349	1.453	5.349
	ROA	10	0.966	0.175	0.787	1.251
Turkey	GDP	10	3.657	4.221	-5.91	9.423
	ROA	10	2.192	0.577	1.476	3.272
Argentina	GDP	10	-.0.056	4.741	-6.854	9.3
	ROA	10	4.775	0.901	3.593	6.105
Brazil	GDP	10	0.385	3.215	-4.351	6.524
	ROA	10	1.52	0.231	1.119	1.917
Croatia	GDP	10	0.508	3.597	-7.262	4.384
	ROA	10	0.831	0.797	-1.159	1.589
India	GDP	10	5.759	1.153	3.893	7.082
	ROA	10	0.637	0.341	-0.011	1.003
Russia	GDP	10	0.726	3.742	-7.827	4.453
	ROA	10	1.422	0.743	0.227	2.469

Summary statistics of the countries covered in the study are included in Table 1. In the analysis, only the data available countries have been considered at the point of creating a

balanced panel data set. Table 1 shows that India (5.75), Turkey (3.65) and Poland (3.53) achieve the highest average growth figures respectively among the selected countries after the global financial crisis. Also it is seen that countries with the highest average for the ROA are Argentina, Turkey and Brazil, respectively. The summary statistics have also shown that the lowest average growth rate in the period under consideration is in Argentina. At this point, it is possible to say that debt crises in Argentina in this period may affect the economic performance. Also, it is seen that India is the country with the lowest average in terms of bank profitability. However, considering the economic growth level, it can be stated that the effect of bank profitability on economic growth is limited.

The econometric models estimated in this study are as follows:

$$\mathrm{ROA_{it}} = \beta_0 + \beta_1 \mathrm{GDP_{it}} + \mu_{it} \qquad (1)$$

Equation (1) shows the effect of economic growth on bank profitability. While β_0 expresses the constant term, β_1 indicates the slope coefficient of the GDP and μ is the error term for the model (1). Likewise, the effect of bank profitability on economic growth is modeled as follows:

$$GDP_{it} = \alpha_0 + \alpha_1 ROA_{it} + \varepsilon_{it} \qquad (2)$$

While α_0 in Model 2 refers to the constant term, α_1 refers to the slope coefficient of ROA. ε_{it} is the error term of model 2. In both models, i (i = 1, 2... N) represents the cross-sectional data size of the variables, and t (t = 1, 2,…, T) represents the time series dimension. Also, i = 1, 2… 8 and t = 2009, 2010… 2018

Two important problems should be considered when using panel data models. The first is the cross-sectional dependence among the countries, which is caused by economic and financial integration. Estimation results that do not take into account the cross-sectional dependence may be biased (Pesaran, 2004). Dependency among the so-called units also appears to be an important factor in determining which of the panel unit root and panel cointegration tests will be preferred in the estimation process. For this purpose, Breusch-Pagan (1980) and Pesaran (2004) tests were used to determine cross-sectional dependence among the analyzed countries. The second important problem is the slope homogeneity. Similarly, slope homogeneity or heterogeneity play an important role in the selection of the methods used in panel data analysis. At this point, the slope homogeneity was tested by the Delta test developed by Pesaran and Yamagata (2008).

In this study, Cross-sectional augmented Dickey Fuller (CADF) test, developed by Pesaran (2007), was used as the second generation panel unit root test due to the detection of cross-sectional dependence and heterogeneity. Firstly, CADF test statistics values are calculated for all countries and then, CIPS (Cross-Sectionally Augmented IPS) statistics for general panel data are obtained by taking the arithmetic mean of these values. In order to determine the consistency of the series and not to cause false unit root, Hadri-Kurozomi (2012) unit root test was used. These two unit root tests were preferred because they take into account the cross-sectional dependence and heterogeneity in the series. At the same time, these two unit root tests also give fit results in the macro panel (T>N).

Finally, the causal relationship between the two variables (ROA and GDP) was investigated. First of all, Dumitrescu-Hurlin (2012) causality test was applied, which developed the traditional Granger (1969) model used in time series and adopted it to panel data models. In order for this test to be applied, the series must be stationary at the same level. At the same time, in accordance with our study, this test can be used both in the presence of cross-sectional dependence and in the case of T> N and in small T and N sample properties according to Monte Carlo simulations. Similar to the Dumitrescu-Hurlin (2012) causality test, Emirmahmutoglu-Kose (2011) causality test, which takes into account the cross-sectional dependence and can be used in small sample properties. Unlike the Dumitrescu-Hurlin (2012) causality test, this test can be used without the need for pre-tests to determine the unit root and cointegration properties of the series. Considering the fractional unit root structure in the series, the results of both causality tests will be presented comparatively. At the same time, test results were obtained for both units and general panel data with these causality tests.

4. ANALYSIS

In this part of the study, firstly the results of cross sectional dependence and slope homogeneity are presented. As explained in section 3, Breusch-Pagan (1980) and Pesaran (2004) test results for cross-sectional dependence between units and Delta test results developed by Pesaran and Yamagata (2008) for slope homogeneity are presented in Table 2:

Table 2: Cross Section Dependence and Slope Homogeneity Tests

Variables	ROA	GDP
LM (Breusch-Pagan 1980)	51.79 (0.004)***	67.79 (0.000)***
CD_{LM} (Pesaran 2004)	3.180 (0.001)***	5.318 (0.000)***
CD (Pesaran 2004)	2.880 (0.004)***	4.550 (0.000)***

Slope Homogenity Tests		
Δ	2.147 (0.016)**	1.932 (0.027)**
Δadj	2.566 (0.005)***	2.309 (0.010)**

Notes: ***, ** and * denote 1%, 5% and 10% significance level, respectively. Numbers in parentheses are p-value.

Secondly, taking into account the results of the cross-sectional dependence and slope homogeneity test, it has been examined whether the variables used in the model are stationary or not. Considering the above findings, the second generation unit root tests taking into account both cross-sectional dependence and country specific heterogeneity in the data, CIPS (Cross-Sectionally Augmented IPS) test of Pesaran (2007) and Hadri-Kurozumi (2012) unit root tests have been applied for the panel data set. Test results are presented in Table 3:

Table 3: Panel CIPS and Hadri-Kurozumi Unit Root Tests

Variables		ROA	GDP
CIPS (2007) Unit Root Test*		-3.293	-3.744
Hadri-Kurozumi (2012) Unit Root Test	ZA ^{SPC}	-1.903 (0.971)	0.167 (0.433)
	ZA ^{LA}	0.531 (0.297)	-1.369 (0.914)

Notes: *1%, 5%, and 10% critical values for the whole panel are − -2.97, −2.52, −2.31, respectively.

Critical values were obtained from Pesaran (2007). Numbers in parentheses are p-value. All the variables were tested with intercept and trend. The optimum lag lengths for the variables were determined with the Schwarz information criterion.

Finally, the causal relationship among the variables determined in accordance with the data used in the study has been analyzed by Dumitrescu-Hurlin (2012) and Emirmahmutoglu and Kose (2011) panel causality tests. The results are shown at Table 4:

Table 4: Emirmahmutoglu-Kose (2011) and Dumitrescu-Hurlin (2012) Panel Granger Causality

Emirmahmutoglu and Kose (2011) Panel Causality Test		
	Wald Statistics	
Country	ROA → GDP	GDP→ ROA
Chile	4.077 (0.043)**	0.917 (0.338)
Poland	4.275 (0.039)**	0.004 (0.948)
Turkey	5.720 (0.017)**	1.568 (0.210)
Argentina	2.145 (0.143)	0.008 (0.927)
Brazil	1.184 (0.276)	0.005 (0.945)
Croatia	0.784 (0.376)	0.105 (0.746)
India	0.066 (0.798)	0.067 (0.795)
Russia	3.155 (0.076)*	0.422 (0.516)
Dumitrescu-Hurlin (2012) Panel Causality Test		

	Z-bar	
	ROA → GDP	GDP→ ROA
	2.629 (0.001)***	0.387 (0.220)

Notes: ***, ** and * denote 1%, 5% and 10% significance level, respectively. Numbers in parentheses are p-value.

5. DISCUSSION

In this study, it is aimed to analyze the effect of bank profit on economic growth or the effect of economic growth on bank profitability after the global crisis of eight countries whose data are available. For this purpose, firstly, whether there is a correlation between units and the slope homogeneity has been examined. Cross-sectional dependence and slope homogeneity in the panel data methods are important in determining the next stage analysis. Table 2 shows that the cross-sectional dependence null hypothesis is strongly rejected. Therefore, there is strong cross-sectional dependence among the analyzed countries. Similarly, according to the results of the Delta test, the null hypothesis slope homogeneity is rejected according to both equation 1 and equation 2. Delta test results also support the slope heterogeneity across the countries considered. These results show that although there are countries whose results are available and chosen randomly, as expected, a shock experienced in one country affects other countries, albeit to different degrees. Table 2 test results make it necessary to use second generation prediction techniques in the final stages of the study.

Table 3 shows the results of two different second generation panel unit root tests for the panel data. The calculated CIPS test statistics values are compared with the critical table values created by Pesaran (2007) with Monte Carlo simulations and the hypotheses are tested for the stationary of the series. As a result of the test, it is seen that the calculated CIPS test statistics values are greater than the absolute value of the critical table values, and so the null hypothesis (unit root in the series) is rejected. According to Hadri-Kurozumi (2012) panel unit root test; it is also seen that the null hypothesis (no unit root in the series) cannot be rejected with the test statistics assumed to have a normal distribution, and there is no unit root in the series. Therefore, variables used in the model for both test results are stationary in level states, i.e. I (0).

Finally, the causal relationship between the ROA and GDP has been analyzed on a country basis by using Emirmahmutoglu and Kose (2011) Panel Causality Test and Dumitrescu-Hurlin (2012) Panel Causality Test for the general panel. According to both test results, the GDP does not cause ROA null hypothesis is not rejected. However, ROA does not cause the GDP null hypothesis is rejected for all of the panel data. It has been determined that ROA is the cause of GDP in Chile, Poland, Turkey and Russia.

6. CONCLUSION

Our study aimed to assess the causal relationship between bank profitability and economic growth with a data set of 8 selected countries covering Argentina, Brazil, Chile, Croatia, India, Poland, Russia, and Turkey over the period of 2009-2018. To do so, we followed the second-generation panel estimation approach by conducting cross-sectional dependence and slope heterogeneity tests. Then, we performed the panel unit root tests. Finally, we estimated the causal relationship between two variables. By taking account several criticisms raised in the literature, this paper provides new insights on the bank profitability-economic growth nexus.

The panel causality test results validate that there is one-way causality running from bank profitability to economic growth. These empirical results support the argument that the current pattern of bank profitability in selected developing countries (Chile, Poland, Turkey and Russia) promotes the economic growth. These results are consisted with the findings from the related literature (Javid, 2016; Alev, 2018; Klein and Weill, 2018).

This paper brings forward an important direction for further studies. A possible future paper may delve into the impact of financial performance (bank loans, bank deposits, return on equity etc.) on economic growth by following a similar empirical method. In countries where bank profitability does not promote economic growth, there may be economic instabilities (Argentina) or other factors such as R&D (India) and investments that trigger economic growth. In addition, this study can be expanded in time and frequency dimensions by increasing the country diversity.

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