"Banking sector development and economic growth nexus in BRICS"

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BANKING SECTOR DEVELOPMENT AND ECONOMIC GROWTH NEXUS IN BRICS

Abstract

The paper examined the influence of the banking sector on economic growth in the BRICS countries using panel data analysis methods (1987–2020). The effect of the complementarity variable on economic growth in BRICS was also explored using the same data set. The lack of agreement in the empirical literature on the relationship between banking sector development and growth motivated this study. The study was also motivated by the desire to deal away with the omitted variable bias which is to a very large extent plagued the available literature on the influence of the banking sector on economic growth. Panel data analysis included fixed effects (FE), fully modified ordinary least squares (FMOLS), and pooled ordinary least squares (OLS). It was observed that the banking sector had a significant positive effect on economic growth under the pooled OLS (all three models) and fixed effects (model 1). Model 2 under the fixed effects indicate a negative significant relationship moving from the banking sector towards economic growth. FMOLS (models 1 and 2), pooled OLS (models 1, 2 and 3), and fixed effects (model 1) show that the complementarity variable enhanced economic growth significantly. Policies aimed at enhancing banking sector development and domestic investment should be implemented without delay by the BRICS countries if they intend to bolster economic growth.

Keywords	panel data, BRICS, banking sector, growth, transitional economies
JEL Classification	C23, C33, D53, E44

INTRODUCTION

The positive role of the banking sector development in the economy is no longer contestable. Levine (1997) noted that the banking sector helps to mobilize savings for investments, allows efficient allocation of resources, provides liquidity in the economy, enables easy risk management in the economy, and helps facilitate domestic and international trade. Such arguments were supported by Pagano (1993), Diamond and Dybvig (1983), Osinubi (1998), Goldsmith (1969), McKinnon (1973), Townsend (1983), Shaw (1973), and Schumpeter (1911).

Empirical studies on the impact of the banking sector on economic growth have been conducted by several researchers. Findings are mixed, diverse and divergent. For example, majority noted that economic growth is enhanced by the banking sector (Abusharbeh, 2017; Hammami & Smida, 2022; Masoud & Hardaker, 2012; Hamza & Khan, 2014; Abubakar & Gani, 2013; Ibrahim & Abdalla, 2020; Rushchyshyn et al., 2021), whilst others produced results indicating that economic growth is negatively affected by banking sector development (Abubakar & Gani, 2013; Tongurai & Vithessonthi, 2018). Few of them noted that the relationship is either non-existent or insignificant (Hui & Jha, 2013), while others indicated that the two variables affect each other (Ahmed et al., 2019; Hui & Jha, 2013).

Consistent with Nguyen (2022), the The final group of researchers agree that the influence of the banking sector on economic growth occurs through channels or that there must be some absorption capacities in the economy. Levine (1997) also argued that the economic growth influence of the banking sector is non-linear, and it occurs through capital accumulation and technological innovation. Despite these views by Levine (1997) and Nguyen (2022), empirical research that investigated the various avenues through which the growth of the economy is affected by banking sector development are very scant.

1. LITERATURE REVIEW

Theoretically, there are five avenues through which economic growth is affected by the financial sector. Firstly, the financial sector enables small investors to less costly participate in collective investment schemes thus promoting diversification and risk management. According to Pagano (1993), such schemes allows huge amounts of financial resources to be pooled together and directed towards economic sectors that are productive. However, the role played by domestic investment in promoting financial sector development's impact on economic growth has so far received minute attention.

A financial sector enables depositors to manage liquidity risk through allowing them to use their illiquid financial assets as collateral security when borrowing money to engage in long term productive projects (Diamond & Dybvig, 1983). The theoretical perspective was supported by Osinubi (1998).

According to McKinnon (1973) and Goldsmith (1969), the financial sector enhances economic growth through savings mobilization, availing funding to firms and individuals intending to invest in productive projects, risk management services provision and provision of efficient information dissemination services in the economy. The theoretical perspective was supported by Townsend (1983) and Shaw (1973).

Schumpeter (1911) argued that the financial sector is a leader in research, technological innovation and allocating financial resources efficiently towards production of new innovative products in the economy. Savings pooling, investment in highly productive projects and risk diversification functions of the financial market was also supported by Schumpeter (1911).

There are several empirical studies that show that the banking sector inspires economic growth, and

they fall into five categories. The first is empirical research, which found out that economic growth is enhanced positively by the banking sector. The secondly is the empirical literature, which noted that the economy is negatively influenced by the banking sector. The third is the group of empirical researchers who observed that economic growth and the banking sector affect each other. Empirical research, which observed that the banking sector and economic growth are not related or are connected in a non-significant manner falls into the fourth category. Fifthly, other empirical studies produced findings that show that the banking sector affects economic growth indirectly through channels such as domestic investment, human capital development, technology, etc.

The limited empirical literature on how the banking sector influences economic growth can be divided into five categories. The positive effect, negative perspective, bi-directional relationship, non-existent/insignificant argument and the absorption capacity category. Commercial banks' liquid liabilities exerted a significant enhancing effect on economic growth in Nigeria in the long run. In contrast, the private sector deleteriously affected economic growth in Nigeria.

Ibrahim and Abdalla (2020) explored the economic growth-banking sector nexus in Sudan using the autoregressive distributive lag (ARDL). In the short run, deposits (% of GDP) enhanced economic growth, whilst in the long run, there was no relationship between the two variables. Abusharbeh (2017) examined the growth-banking sector nexus using Palestine as a focal point using ordinary least squares (2000–2015). Banking credit had a significant enhancing impact on economic growth, whilst customer deposits, interest rate and the number of bank branches had an insignificant enhancing influence on economic growth. Hammami and Smida (2022) examined the nexus between the banking sector and eco-

nomic growth in Tunisia using multi-regression analysis with data spanning from 1980 to 2017. It was noted that the positive impact of the use of bank deposits on economic growth in Tunisia is statistically insignificant.

In the context of EU countries, Rushchyshyn et al. (2021) explored the interrelationship between the banking sector and economic growth using panel data analysis approaches (2000–2019). Economic growth was enhanced significantly by the banking sector in EU selected countries, including Ukraine. In emerging markets, Masoud and Hardaker (2012) explored the economic growth-financial development nexus using panel data estimation methods. A unidirectional causality relationship was detected running from the banking sector towards the growth of the economy, whilst a long-run relationship between economic growth and stock market development progress was also observed. The banking sector-growth nexus in Pakistan using multiple regression analysis with time series data (2008–2012) was studied by Hamza and Khan (2014). Economic growth in Pakistan was significantly enhanced by loan advances, bank deposits, bank investments and profitability.

Tongurai and Vithessonthi (2018) explored the linkage between the banking sector and economic growth employing the panel data analysis (1960–2016) for the countries of the world. A negative influence of the banking sector on agricultural sector production and growth was observed. Hammami and Smida (2022) observed that broad money had a deleterious impact on the growth of the economy in Tunisia. In the context of Nigeria, Abubakar and Gani (2013) produced results that show that private sector credit had a negative influence on the economy during the period under study (1970–2010).

Ahmed et al. (2019) showed a feedback relationship between the banking sector and economic growth. Using Bangladesh as a focal point, a study on the growth-banking sector nexus with vector error correction model (VECM) and time series data (1980–2016) was done by Ahmed et al. (2019). Feedback relationship between the two variables was observed. Empirical research

that noted that the relationship between the two variables is insignificant or non-existent include Hui and Jha (2013). Using Granger causality tests, Hui and Jha (2013) examined the growth-banking sector nexus in Nepal using the 1975–2010 period time series data. Loan and advances, deposits and banking assets had no causality relationship with growth in Nepal.

The absorption capacity view that says that certain variables must be in place to enable economic growth inspired by the banking sector is supported by Nguyen (2022). Nguyen (2022) studied the causality between the banking sector and economic growth in Vietnam using ARDL and 2007–2020 time series data.

Consistent with Nguyen (2022), the banking sector enhances economic growth through its ability to convert savings into investments. This was captured in equations (2), (3) and (4) through the inclusion of the complementarity variable (banking sector development x domestic investment). For this reason, this paper studied if domestic investment is an avenue through which the banking sector affected the economic growth.

In line with Abusharbeh (2017), the study expects an economic growth triggered by the banking sector through the domestic investment channel. Pooled OLS, fixed effects and the FMOLS were used.

Control variables are discussed next. Haq (2012) argued that domestic investment is a productive factor that increases capital formation and enhances growth. The author noted that domestic investment increases the quantity of economic activities in the country hence paving a way to produce new goods and services that enhances economic growth. In this paper, economic growth is expected to be enhanced by domestic investment. Domestic investment in this study was proxied by gross capital formation.

According to Romer (1999), foreign direct investment brings in new technology, skills, human capital development, physical capital and reduces unemployment, which are all important elements for growth. Over-reliance on FDI

leads to long-term negative consequences for the economy and income distribution in the host country (Bornschier & Chase-Dunn, 1985). According to the literature, economic growth enhanced by foreign direct investment could be either way. Net foreign direct investment as a ratio of GDP is a proxy for FDI employed.

Trade openness negatively affects the economy if citizens and domestic firms prefer to purchase their inputs and/or products from other countries even if they can be found locally (Baltagi et al., 2009). This kills the local industry and is not good for long-term growth. Trade openness allows local firms to actively participate in international financial and commodity markets, hence enabling them to bring foreign currency and buy inputs and commodities at competitive prices (Coe & Helpman, 1995). Such benefits allow the local industry and economy as a whole to expand and grow. Trade openness affects economic growth either way. Total trade as a ratio of GDP is a proxy for trade openness used.

Fedderke and Garlick (2008) argued that infrastructural development was an engine and a necessary element for economic growth. Infrastructural development employed fixed telephone subscriptions (per 100 people) as its measure. Infrastructural development is anticipated to enhance growth.

Consistent with Adarkwa (2015), personal remittances flow is paramount in ensuring the labor sending economy in the following ways. The study mentions that it happens through its ability to provide capital or funding for (1) small projects by people back home, (2) educational fees (both high school and tertiary education). The expectation is that economic growth is enhanced by personal remittances in this study. Personal remittances received as a ratio of GDP was used as a measure of personal remittances for the purposes of this study.

Pradhan and Abraham (2002) argued that the educated, skilled and health people are better able to contribute to economic growth through bringing in new ideas, technical expertise and technological innovations. Human capital development's positive effect on economic growth

is expected to manifest. The human capital development index is used as a proxy for human capital development.

2. METHODOLOGY AND DATA

Panel data (1987–2020) for the BRICS nations used in this study were obtained from publicly available databases such as World Development Indicators and Reserve Bank of South Africa.

Consistent with prior empirical research on a similar subject done by Ibrahim and Abdalla (2020), Abubakar and Gani (2013), Hammami and Smida (2022), Abusharbeh (2017), Hamza and Khan (2014), Masoud and Hardaker (2012), Abubakar and Gani (2013), and Rushchyshyn et al. (2021), the general model specification appears as follows:

$$GROWTH = f\left(BANK,\ DINVEST,\ FDI,\ OPEN,\ INFR,\ REMIT,\ HCD\right), \tag{1}$$

where $GROWTH$, $BANK$, $DINVEST$, FDI, $OPEN$, $INFR$, $REMIT$, and HCD, respectively, stand for economic growth, banking sector development, foreign direct investment, domestic investment, infrastructural development, trade openness, human capital development, and personal remittances.

Equations (2), (3) and (4) are the econometric ones used to estimate the economic growth inspired by the banking sector in BRICS. Difference among the three econometric equations lies in the proxy of the banking sector development used.

$$GROWTH_{it} = \beta_0 + \beta_1 BANK1_{it} + \\ +\beta_2 DINVEST_{it} + \beta_3\left(BANK1_{it}\cdot DINVEST_{it}\right) + \\ +\beta_4 FDI_{it} + \beta_5 OPEN_{it} + \beta_6 INFR_{it} + \\ +\beta_7 REMIT_{it} + \beta8 HCD_{it} + \mu + \varepsilon, \tag{2}$$

$$GROWTH_{it} = \beta_0 + \beta_1 BANK2_{it} + \\ +\beta_2 DINVEST_{it} + \beta_3\left(BANK2_{it}\cdot DINVEST_{it}\right) + \\ +\beta_4 FDI_{it} + \beta_5 OPEN_{it} + \beta_6 INFR_{it} + \\ +\beta_7 REMIT_{it} + \beta8 HCD_{it} + \mu + \varepsilon, \tag{3}$$

$$GROWTH_{it} = \beta_0 + \beta_1 BANK3_{it} +$$
$$+ \beta_2 DINVEST_{it} + \beta_3 \left(BANK3_{it} \cdot DINVEST_{it} \right) + \quad (4)$$
$$+ \beta_4 FDI_{it} + \beta_5 OPEN_{it} + \beta_6 INFR_{it} +$$
$$+ \beta_7 REMIT_{it} + \beta 8 HCD_{it} + \mu + \varepsilon.$$

Domestic credit to private sector (% of GDP) was used in equation (1), whilst broad money supply as a ratio of GDP was used in equation (2). Monetary sector credit to private sector as a ratio of GDP is the banking sector proxy used in equation (3).

3. RESULTS

This section focuses on trend analysis, panel unit root tests, co-integration tests and final analysis.

3.1. Trend analysis

Figure 1 presents the results of the banking sector development trends for BRICS during the period from 1987 to 2020.

According to Figure 1, broad money supply for Brazil massively increased from 20.66% of GDP in 1987 to 93.66% of GDP in 1993, declined 50.85 percentage points between 1993 and 1999, and then increased by 17.32 percentage points between 1999 and 2005 (from 42.81% of GDP in 1999 to 60.13% of GDP in 2005). Brazil's money supply grew by 16.69 percentage points between 2005 and 2011, increased from 76.83% of GDP in 2011 to 93.06% of GDP in 2017, and then further positively grew by 18.17 percentage points during the period between 2017 and 2020.

Broad money supply for Russia increased from 19.49% of GDP in 1987 to 22.74% of GDP in 1993, marginally went up by 0.71 percentage points (between 1993 and 1999) and then positively grew from 23.45% of GDP in 1999 to 33.38% of GDP in 2005. Russia's broad money supply went up by 14.01 percentage points between 2005 and 2011, increased from 47.39% of GDP in 2011 to 59.52% of GDP in 2017 before going up by 10.63 percentage points between the years 2017 and 2020. The broad money supply trend for China during the period between 1987 and 2020 is like that of Russia.

India's broad money supply increase from 42.63% of GDP in 1987 to 44.88% of GDP in 1993, went up by 6.18 percentage points between 1993 and 1999 and then gone up from 51.06% of GDP in 1999 to 65.55% of GDP in 2005. The broad money supply for India went up by 13.29 percentage points between 2005 and 2011, plummeted from 78.84% of GDP in 2011 to 74.14% of GDP in 2017 before going up by 13.77 percentage points (between 2017 and 2020).

Broad money supply for South Africa went down from 46.31% of GDP in 1987 to 41.52% of GDP in 1993, increased by 8.74 percentage points between 1993 and 1999, and then further went up from 50.26% of GDP in 1999 to 59.76% of GDP in 2005. South Africa's money supply increased by 8.07 percentage points (2005 to 2011), marginally went down from 67.83% of GDP in 2011 to 66.14% of GDP in 2017 before going up by 8.45 percentage points (2017 to 2020).
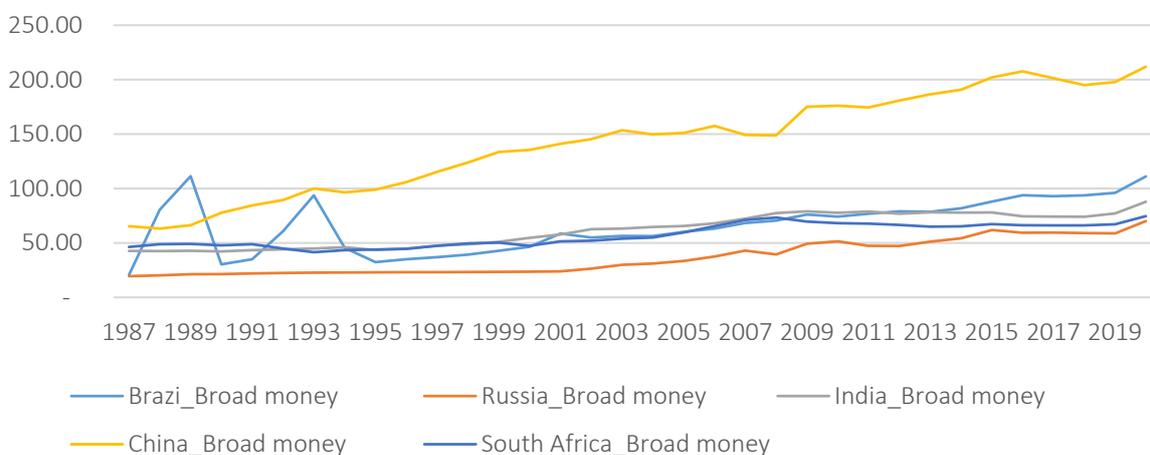

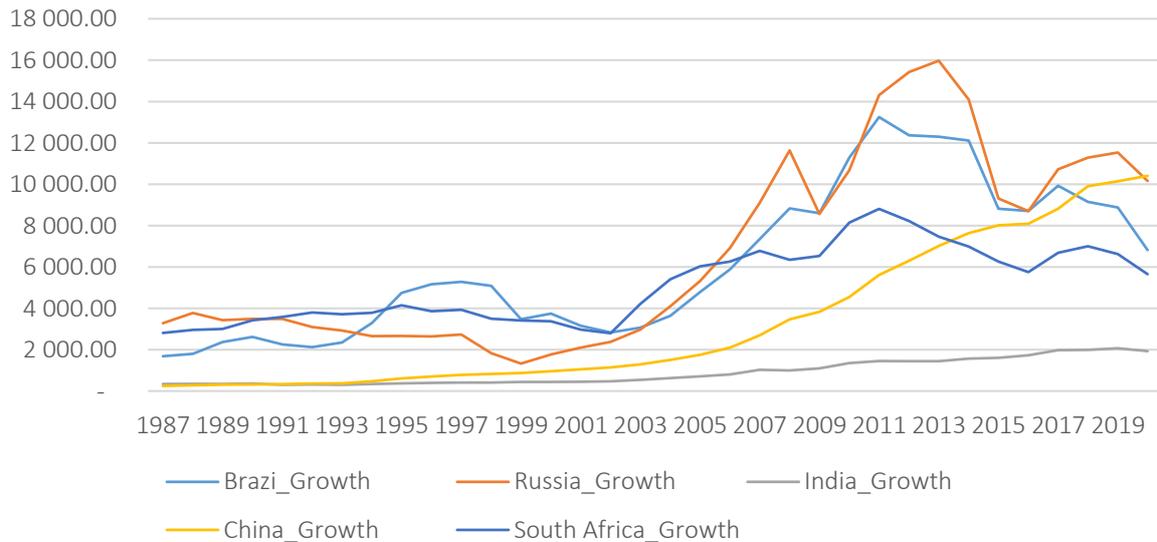**Figure 1.** Broad money supply (% of GDP) trends for BRICS

Figure 2. GDP per capita (USD) trends for BRICS

Gross domestic product (GDP) per capita (1987–2020) trend analysis for BRICS is presented in Figure 2.

According to Figure 2, Brazil's GDP per capita went up from USD 1,685.82 in 1987 to USD 2,348.09 in 1993, increased by 48.20% between 1993 and 1999, went up by 37.66% (1999–2005) before massively going up by 176.50% between 2005 and 2011 (from USD 4,790.46 in 2005 to USD 13,245.39 in 2011). The period between 2011 and 2017 saw GDP per capita for Brazil marginally declining by 25.04% before further plummeting by 31.36% during the period between 2017 and 2020 (from USD 9,928.68 in 2017 to USD 6,814.88 in 2020).

Russia's GDP per capita declined from USD 3,282.18 in 1987 to USD 2,930.67 in 1993, declined by 54.59% during a subsequent six-year period, increased from USD 1,330.76 in 1999 to USD 5,323.46 in 2005 before further going up by 168.83% during the period between 2005 and 2011. Russia's GDP per capita declined by 25.09% between 2011 and 2017 before further decreasing from USD 10,720.33 in 2017 to USD 10,161.98 in 2020.

GDP per capita for India declined from USD 340.42 in 1987 to USD 301.16 in 1993, went up by 46.77% between 1993 and 1999, increased by 61.73% during the period from 1999 to 2005 before massively going up by 103.97% (from USD 714.86 in 2005 to USD 1,458.10 in 2011). Between 2011 and 2017, India's GDP per capita increased by 35.85% and then plummeted from USD 1,980.67 in 2017 to USD 1,933.10 in 2020, representing a 2.40% decline.

China's GDP per capita consistently went up in all the six-year intervals throughout the study from 1987 to 2020. Its GDP per capita increased by 49.87% between 1987 and 1993, went up from USD 377.39 in 1993 to USD 873.29 in 1999 before going up by 100.78% (1999–2005). The period between 2005 and 2011 saw China's GDP per capita massively going up by 220.19%, increased from USD 5,614.35 in 2011 to USD 8,816.99 in 2017 and then went up by 18.05%, from USD 8,816.99 in 2017 to USD 10,408.67 in 2020.

For South Africa, its GDP per capita increased by 31.95% between 1987 and 1993, it declined from USD 3,713.92 in 1993 to USD 3,417.26 in 1999 before going up by 76.55% between 1999 and 2005 (from USD 3,417.26 in 1999 to USD 6,033.10 in 2005. South Africa's GDP per capita went up by 46.04% between 2005 and 2011, declined by 24.06% between 2011 and 2017 before further going down from USD 6,690.94 in 2017 to USD 5,655.87 in 2020.

3.2. Panel stationarity results

Table 1 presents panel stationarity test results.

Table 1. Individual intercept – Stationarity tests

Source: Author's calculations.

Variables	LLC	IPS	ADF	PP
Level				
LGROWTH	−0.17**	1.26	5.06	4.06
LBANK1	−0.40	1.04	9.18	12.45
LBANK2	−0.80	0.94	10.59	22.70**
LBANK3	−0.36	0.81	7.78	8.54
LFDI	−2.10**	−1.29*	14.09	16.85
LOPEN	−1.81**	−1.17	16.38*	22.09**
LINFR	−3.23***	−1.27	15.27*	13.74*
LREMIT	−4.53***	−4.58***	42.32***	31.64***
LHCD	−3.03***	−2.61***	24.92***	33.08***
LDINVEST	−0.44	−1.01	12.28	10.02
First difference				
LGROWTH	−3.02***	−3.94***	33.80***	47.56***
LBANK1	−0.98***	−7.37***	69.09***	147.39***
LBANK2	−6.75***	−8.74***	71.58***	90.21***
LBANK3	−3.53***	−6.54***	61.06***	87.45***
LFDI	−5.41***	−8.69***	82.29***	132.60***
LOPEN	−6.43***	−6.20***	57.07***	110.61***
LINFR	−4.18***	−7.16***	63.18***	153.17***
LREMIT	−4.32***	−7.96***	74.75***	108.24***
LHCD	−11.83***	−11.31***	110.65***	134.54***
LDINVEST	−7.91***	−7.86***	73.25***	102.18***

*Note: *, ** and *** respectively represent 10%, 5% and 1% significance levels.*

3.3. Panel co-integration results

Table 2 contains panel cointegration test results. The results show that a long-run relationship between the variables existed, and there are at most seven co-integrating vector relationships between and among the variables.

3.4. Final data analysis

Table 3 presents fixed effects' results. FMOLS were presented in Table 4, whereas Table 5 contains the pooled OLS results. Model 1 to 3 are distinguished by the proxy of banking sector development used. Model 1 used the ratio to GDP of domestic cred-

it to private sector, model 2 employed the broad money supply ratio to GDP, whilst model 3 made use of the monetary sector credit to private sector as a ratio of GDP measure of banking sector development.

Table 3. Fixed effects results

Source: Author's calculations.

Variables	Economic growth		
	(1)	(2)	(3)
BANK	0.1682*	−0.1832*	−0.2898
DINVEST	0.1811**	0.1903	0.8980
BANK.DINVEST	0.9018***	0.1229	0.2788
FDI	0.0368	0.0374	0.0327
OPEN	−0.3891**	−0.3618**	−0.2202
INFR	0.2591***	0.1862**	0.4646***
REMIT	0.1082*	0.0655	0.1246*
HCD	0.4283	0.5535	0.4663
Countries	5	5	5
R-squared adjusted	0.84	0.86	0.80
F-statistics	74.85	86.57	58.52
F-statistics probability	0.00	0.00	0.00

*Note: *, ** and *** respectively represent 10%, 5% and 1% significance levels.*

Table 4. FMOLS results

Source: Author's calculations.

Variables	Economic growth		
	(1)	(2)	(3)
BANK	0.0048	−0.1893	−0.1657
DINVEST	0.1802	0.8787*	0.2627
BANK.DINVEST	0.7407**	0.8738***	0.8792
FDI	0.0240	0.0406	0.0562
OPEN	−0.4813*	−0.4816**	−0.4089
INFR	0.2546**	0.1749**	0.4560***
REMIT	0.1017	0.0506	0.1428
HCD	0.2579	0.2191	0.0891
R-squared adjusted	5	5	5
F-statistics	0.84	0.84	0.79
F-statistics probability	0.00	0.00	0.00

*Note: *, ** and *** respectively represent 10%, 5% and 1% significance levels.*

Table 2. Panel co-integration using the Johansen Fisher approach

Source: Author's calculations.

Hypothesized No. of CE(s)	Trace test statistic	Probability	Max-eigen test statistic	Probability
None	3.18	0.8217	36.00	0.0000
At most 1	67.16	0.0000	387.0	0.0000
At most 2	328.0	0.0000	172.4	0.0000
At most 3	293.4	0.0000	128.8	0.0000
At most 4	258.1	0.0000	95.48	0.0000
At most 5	176.3	0.0000	68.17	0.0000
At most 6	77.82	0.0000	31.28	0.0000
At most 7	42.19	0.0002	26.72	0.0001

Table 5. Pooled OLS results

Variables	Economic growth		
	(1)	(2)	(3)
BANK	0.4172***	0.2978***	0.8763***
DINVEST	0.1893***	0.2762***	0.9032***
BANK.DINVEST	0.2859***	0.8978***	0.2576***
FDI	−0.0810*	−0.0868**	−0.0634
OPEN	0.2023	0.1915	0.1288
INFR	0.5438***	0.5294***	0.6076***
REMIT	0.0748*	0.0718*	0.1078**
HCD	0.0217***	0.1114***	0.9267***
R-squared adjusted	5	5	5
F-statistics	0.72	0.73	0.74
F-statistics probability	0.00	0.00	0.00

*Note: *, ** and *** respectively represent 10%, 5% and 1% significance levels.*

Pooled OLS and fixed effects under model 1, pooled OLS under model 2, and pooled OLS under model 3 show that the positive effect of the banking sector on growth was significant, whilst the model under FMOLS indicates an insignificant enhancing influence of the banking sector on growth. These results agree with the existing literature that argues that a financial sector allows depositors to manage liquidity risk through allowing them to use their illiquid financial assets as collateral security when borrowing money to engage in long-term productive projects (Diamond & Dybvig, 1983). A non-significant deleterious impact of the banking sector on growth was observed under fixed effects (model 3) and FMOLS (models 2 and 3), whilst model 2 indicates a significant negative influence of banking sector development on economic growth under the fixed effects. These results auger well with those of empirical studies by Tongurai and Vithessonthi (2018) and Abubakar and Gani (2013).

A significant enhancing relationship from domestic investment towards economic growth was observed under the pooled OLS (models 1, 2 and 3), FMOLS (model 2) and fixed effects (model 1). Model 1 under the FMOLS, model 2 under fixed effects and model 3 under FMOLS indicate a non-significant relationship running from domestic investment towards economic growth. Both sets of results are consistent with Haq (2012) who argued that domestic investment is a productive factor that increases the capital formation and enhances the growth of the economy.

Model 1 across the three panel methods shows that growth was improved significantly by the complementarity aspect (banking sector development x domestic investment). Similar results were observed in (1) model 2 under pooled OLS and FMOLS and in (2) model 3 under the pooled OLS approach. This is in line with Nguyen (2022), whose study noted that certain variables must be in place to enable banking sector development to significantly enhance economic growth. Fixed effects (models 2 and 3) and FMOLS (model 3) produced results indicating that growth was enhanced by the complementarity variable in a non-significant manner, results that generally support the findings of Nguyen (2022).

CONCLUSION

This paper explored the impact of the banking sector on growth in BRICS employing panel data (1987–2020) analysis methods. The impact of the complementarity variable on economic growth in the BRICS countries was also examined using the same data set. A lack of agreement in the empirical literature available on the banking sector development-growth nexus triggered the author to add his voice on the subject matter. The study was also motivated by the desire to deal away with the omitted variable bias that to a very large extent plagued the available empirical literature on the influence of the banking sector on growth. Banking sector was observed to have a positive and significant impact on economic growth under the pooled OLS (all three models) and fixed effects (model 1). Model 2 under the fixed effects shows a negative significant influence of the banking sector on growth. FMOLS (models 1 and 2), pooled OLS (models 1, 2 and 3) and fixed effects (model 1) show that growth was significantly improved by the complementarity variable. Policies geared at enhancing banking sector development and domestic investment should be implemented with urgency by BRICS if they intend to strengthen economic growth. An analysis of the threshold level of the banking sector development required to trigger significant economic growth is a possible empirical study that can add more value to policy making in the context of the BRICS.

AUTHOR CONTRIBUTIONS

Conceptualization: Kunofiwa Tsaurai.
Data curation: Kunofiwa Tsaurai.
Formal analysis: Kunofiwa Tsaurai.
Investigation: Kunofiwa Tsaurai.
Methodology: Kunofiwa Tsaurai.
Project administration: Kunofiwa Tsaurai.
Resources: Kunofiwa Tsaurai.
Software: Kunofiwa Tsaurai.
Validation: Kunofiwa Tsaurai.
Writing – original draft: Kunofiwa Tsaurai.
Writing – reviewing & editing: Kunofiwa Tsaurai.

REFERENCES

1. Abubakar, A., & Gani, I. M. (2013). Impact of banking sector development on economic growth: Another look at the evidence from Nigeria. *Journal of Business Management and Social Sciences, 2*(4), 47-57. Retrieved from https://www.semanticscholar.org/paper/Impact-of-Banking-Sector-Development-on-Economic-at-Abubakar-Gani/f83a65b0390df-967945393021cf81ae0df985dbe

2. Abusharbeh, M. T. (2017). The impact of banking sector development on economic growth: Empirical analysis from Palestinian economy. *Journal of Emerging Issues in Economics, Finance and Banking, 6*(2), 2306-2316. Retrieved from https://www.aaup.edu/publication/mohammed.abusharbeh/article/impact-banking-sector-development-economic-growth-empirical-analysis-palestinian-economy

3. Adarkwa, M. A. (2015). Impact of remittances on economic growth: Evidence from selected West African countries (Cameroon, Cape Verde, Nigeria and Senegal). *AHMR, 1*(2), 177-199. Retrieved from https://sihma.org.za/journals/3.-Muriel-Animwaa-Adarkwa1.pdf

4. Ahmed, R., Yousuf, M., & Lubna, N. A. (2019). Banking sector development and economic growth in Bangladesh: An empirical analysis., *Canadian Journal of Research's Society, 9*(1), 1-10. Retrieved from https://ajhssr.com/wp-content/uploads/cfdb7_uploads/1546411908-Bank-based-financial-development-and-economic-growth.pdf

5. Aye, G. C., & Edoja, P. E. (2017). Effect of economic growth on C02 emission in developing countries: Evidence from a dynamic panel threshold model. *Cogent Economics and Finance, 5*(1), 1-22.

6. Baltagi, B. H, Demitriades, P. O., & Law, S. (2009). Financial development, openness and institutions: Evidence from panel data. *Journal of Development Economics, 89*(2), 285-296. https://doi.org/10.1016/j.jdeveco.2008.06.006

7. Bornschier, V., & Chase-Dunn, C. (1985). *Transnational Corporations and Underdevelopment*. New York: Praeger.

8. Coe, T. D., & Helpman, E. (1995). International research and development spill overs. *European Economic Review, 39*(5), 859-887. https://doi.org/10.1016/0014-2921(94)00100-E

9. Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance and liquidity. *The Journal of Political Economy, 91*(3), 401-419. Retrieved from https://www.jstor.org/stable/1837095

10. Fedderke, J., & Garlick, R. (2008). *Infrastructure development and economic growth in South Africa: A review of the accumulated evidence* (Policy Paper No. 12). School of Economics, University of Cape Town and Economic Research Southern Africa. Retrieved from https://www.ecsecc.org/datarepository/documents/pp12_55323.pdf

11. Goldsmith, R. W. (1969). *Financial structure and development*. Yale University Press, New Haven, CT.

12. Hammami, S., & Smida, M. (2022). What is the role of the banking sector in economic growth? Case of Tunisian banks. *Noble International Journal of Economics and Financial Research, 7*(1), 24-31. Retrieved from https://ideas.repec.org/a/nap/nijefr/2022p24-31.html

13. Hamza, S. M., & Khan, E. A. (2014). Effect of banking sector performance in economic growth: Case study of Pakistan. *Journal of Applied Environment Biology, 4*(7S), 444-449. Retrieved from https://www.textroad.com/pdf/JAEBS/J.%20Appl.%20Environ.%20Biol.%20Sci.,%204(7S)444-449,%202014.pdf

14. Haq, A. U. (2012). Impact of investment activities on economic growth of Pakistan. *Business Management, 2*, 92-100.

15. Hui, X., & Jha, S. (2013). The impact of commercial banking performance on economic growth. *Proceedings of the Institute of Industrial Engineers Asian Conference* (pp. 1503-1511). https://doi.org/10.1007/978-981-4451-98-7_176

16. Ibrahim, M. H., & Abdalla, A. M. A. (2020). The impact of banking sector development on economic growth: Evidence from Sudan. *International Journal of Business Management and Economic Research, 11*(3), 1797-1804. Retrieved from http://www.ijbmer.com/docs/volumes/vol11issue3/ijbmer2020110303.pdf

17. Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53-74. https://doi.org/10.1016/S0304-4076(03)00092-7

18. Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics, 108*(1), 1-24. https://doi.org/10.1016/S0304-4076(01)00098-7

19. Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature, 35*(2), 688-726. Retrieved from https://www.jstor.org/stable/2729790

20. Masoud, N., & Hardaker, G. (2012). The impact of financial development on economic growth: Empirical analysis of emerging market countries.

Studies in Economics and Finance, (3), 148-173. https://doi.org/10.1108/10867371211246830

21. McKinnon, R. I. (1973). *Money and Capital in Economic Development.* Washington, DC: The Brooklings Institution.

22. Nguyen, P. T. (2022). The impact of banking sector development on economic growth: The case of Vietnam's transitional economy. *Journal of Risk and Financial Management, 15*(8), 1-18. https://doi.org/10.3390/jrfm15080358

23. Osinubi, T. S. (1998). *Stock Market Development and Long-run Growth in Nigeria* (Master's Thesis). University of Ibadan Nigeria.

24. Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review, 37*(2-3), 613-622. https://doi.org/10.1016/0014-2921(93)90051-B

25. Pradhan, J. P., & Abraham, V. (2002). Does human development policy matter for economic growth? Evidence from Indian states. *South Asia Economic Journal, 3*(1), 78-93. https://doi.org/10.1177/139156140200300105

26. Romer, P. (1999). Endogenous Technological Change. *Journal*

of Political Economy, 98, 71-102. Retrieved from https://www.jstor.org/stable/2937632

27. Rushchyshyn, N. Mulska, O. Nikolchuk, Y. Rushchyshyn, M., & Vasyltsiv, T. (2021). The impact of banking sector development on economic growth: Comparative analysis of Ukraine and some EU countries. *Investment Management and Financial Innovations, 18*(2), 193-208. Retrieved from http://dx.doi.org/10.21511/imfi.18(2).2021.16

28. Schumpeter, J. A. (1911). *The Theory of Economic Development.* Cambridge, MA: Harvard University Press.

29. Shaw, E. S. (1973). *Financial Deepening in Economic Development.* New York, NY: Oxford University Press.

30. Tongurai, J., & Vithessonthi, C. (2018). The impact of banking sector on economic structure and growth. *International Review of Financial Analysis, 56,* 193-207. https://doi.org/10.1016/j.irfa.2018.01.002

31. Townsend, M. R. (1983). Financial structure and economic activity. *American Economic Review, 73*(5), 895-911. Retrieved from https://www.jstor.org/stable/1814661