Original Research

SAGE Open
October-December 2020: 1–14

DOI: 10.1177/2158244020963064
journals.sagepub.com/home/sgo
SAGE

Does Financial Sector Promote Economic Growth in Pakistan? Empirical Evidences From Markov Switching Model

Abdul Rahman[1], Muhammad Arshad Khan[2], and Lanouar Charfeddine[3]

Abstract

This study investigates the financial development–economic growth relationship in Pakistan over the period 1975–2017 using the Markov Switching methodology. The financial development index has been constructed using the principal component analysis. Unexpectedly, the empirical result shows that financial development contributing negatively to economic growth in the high and the low economic growth regimes in Pakistan. Moreover, the results indicate that labor force retards economic growth with a higher magnitude. A significant positive effect of gross fixed capital formation on economic growth is also observed. The results reveal that policymakers may revisit the financial development policies so that the financial sector may contribute positively to economic growth process in Pakistan. In this respect, more steps are needed to further liberalize the financial sector to enhance economic growth in Pakistan.

Keywords

financial development, economic growth, principal component analysis, Markov switching analysis, Pakistan

Introduction

It is well established that financial sector plays an important role in economic growth (Chung et al., 2019). This sector is of curiosity for policymakers and academicians as theoretical and empirical literature corroborates that financial development acts as an engine of economic growth in both developed and developing countries. A well-organized financial system provides better quality financial services, which in turn enhances economic growth, while less developed financial sector may restrict the economy from growing. Beck (2008) noted that the level of financial development is most important macroeconomic variable which is highly correlated with economic performance across countries. Likewise, Shahbaz et al. (2017) found positive effect of financial development on economic activities in India and China. Numerous theoretical and empirical studies (e.g., Asteriou & Spanos, 2019; Caporale et al., 2014; Gurley & Shaw, 1955; King & Levine, 1993; Levine, 2005; McKinnon, 1973; Naveed & Mahmood, 2019; Schumpeter, 1911) identified multiple channels through which financial markets exerts positive impact on economic growth across countries. These studies concluded that well-developed financial markets can improve economic growth through efficient allocation of capital resources, lowers information and transaction costs, enhances monitoring and corporate governance, mobilizes savings, mitigates investment risk, overcomes indivisibility of large investment projects, and fosters competition in the financial industry (Beck et al., 2016). There is growing evidence that better financial environment leads to higher economic growth by reducing financing constraints for entrepreneurs, improves efficiency of resource allocation across investment projects, and fosters technology diffusion (Comin & Nanda, 2019; Levine & Zervos, 1998). However, there are conflicting views with regard to the role of financial development in economic growth. For instance, Levine (2005) argued that financial markets boost economic growth by reallocating capital resources to its best productive use. The endogenous growth theory also highlighted the role of financial development in economic growth through the positive impact of financial services on the level of capital accumulation (Odhiambo, 2004; Romer, 1990) and technological innovation (Grossman & Helpman, 1991). Chandavarkar (1992) expressed skepticism by ignoring the role of financial system in economic growth process. However, Lucas (1988) asserted that the importance

[1]Department of Management Sciences, COMSATS University, Islamabad, Pakistan
[2]Department of Economics, COMSATS University, Islamabad, Pakistan
[3]College of Business and Economics, Qatar University, Doha, Qatar

Corresponding Author:
Abdul Rahman, Department of Management Sciences, COMSATS University, Park Road, Islamabad 45550, Pakistan.
Email: rehmansargodha@yahoo.com

of financial sector is over-stressed with respect to its role in economic development. Likewise, Robinson (1952) advocated that finance does not contribute to economic growth, rather it fulfills the demands of real sector. Ranciere et al. (2006) asserted that financial liberalization induces excessive risk taking, increases macroeconomic volatility, and leads more frequent crises. Schularick and Taylor (2012) and Mian and Sufi (2014) also maintained that inadequately supervised financial system may attract crises that lead to adverse implications for economic growth and social welfare.

Numerous empirical studies (e.g., Abu-Bader & Abu-Qarn, 2008; Khan & Senhadji, 2000; King & Levine, 1993; Levine, 1997; Samargandi et al., 2014; Shahbaz et al., 2017) have found positive relationship between financial development indicators and economic growth in developed and developing countries. Keeping the significant role of financial sector in economic growth, majority of developed and developing countries implemented financial liberalization programs to purge the impacts of domestic repressive policies. It is believed that these structural shifts in financial policies have changed the relationship between financial development and economic growth from linear to nonlinear. Subsequently, some studies (for instance, Deidda & Fattouh, 2002; Rioja & Valev, 2004) found that financial development has a positive impact on economic growth above the specific threshold value, while others (for instance, Arcand et al., 2015; Cecchetti & Kharroubi, 2012; Law & Singh, 2014; Shen & Lee, 2006) detected the opposite impacts. This suggests that economic growth increases with financial development up to a certain minimum level, afterwards it drags economic growth. Ruiz (2018) also found that countries below the threshold grow less and those above the threshold grew faster. Likewise, Benczur et al. (2019) found the nonlinear impacts of total bank credit on economic growth is more pronounced than that of either household credit alone or the sum of bank credit, debt securities and stock market financing. They also found that credit to nonfinancial corporation tends to have a positive impact, while credit to households exerted negative impact on economic growth even after controlling for nonlinearities. Ductor and Grechyna (2015) observed negative effect of financial development on economic growth, while Swamy and Dharani (2019) found inverted U-shaped relationship between the two. The main reason of nonlinear impacts of financial development on economic growth could be too much finance in many countries, thus questioning the desirability of large financial sector (Benczur et al., 2019). Similarly, some researcher (for instance, Arcand et al., 2015; Cecchetti & Kharroubi, 2012; De Gregorio & Guidotti, 1995; Gennaioli et al., 2012; Zhao, 2017) found that excessive finance drags economic growth.

With respect to Pakistan majority of empirical studies (e.g., Jalil & Ma, 2008; Khan et al., 2005; Mahmood, 2013; Naveed & Mahmood, 2019; Tahir, 2008) have used linear approach to detect the relationship between financial development and economic growth. However, inferences based on the linear relationship become defunct after the structural changes in the form of financial sector reforms initiated in Pakistan in the early 1990s. Benczur et al. (2019) noted that nonlinear impacts of financial development on economic growth stem from substantial structural change in the composition of finance during the recent decades. In addition, using certain financing components separately or as a ratio may bias the estimations and lead to incorrect conclusions, thus provide spurious implications. It is obvious that structural shifts in financial policies make finance–growth relationship nonlinear as Brooks (2014) indicated that financial time series have leptokurtic distribution. Therefore, linear modeling techniques are inadequate for estimation of finance–growth relationship. It is pertinent to note that historical trend of real gross domestic product (GDP) growth in Pakistan is uneven as Amjad (2014) confirmed that the pace of GDP growth does not remain same during Pakistan's economic history. He observed the spurts and reversals in high and low economic growth periods; thus, linear modeling techniques are inadequate to capture the spurts and reversal in economic growth in Pakistan.

The present study uses the Markov Switching (*MS*) modeling technique to capture the nonlinearities in the finance-growth nexus in Pakistan. Earlier studies (e.g., Ali & Bhutta, 2018; Jalil & Ma, 2008; Khan et al., 2005, 2019; Mahmood, 2013; Naveed & Mahmood, 2019; Uppal & Mangla, 2018) have investigated the relationship between financial development and economic growth in Pakistan and overlooked the possible nonlinear aspect of finance–growth relationship. Therefore, the present study examines regime-specific relationship between financial development and economic growth in Pakistan. To this end, we employed the Markov switching (*MS*) approach which is useful to deal with regime-specific relationship among macroeconomic variables. The *MS* follows first-order Markov chain processes in determining the regime-specific characteristics of variables of interest. The *MS* model is flexible in the sense that means, variances, and autoregressive terms can be assumed state-dependent either individually or all together. This would makes it superior to Threshold Autoregressive (*TAR*) and Smooth Transition Autoregressive (*STAR*) models (Zivot & Wang, 2007). The results based on the *MS* model may provide deeper insights for financial market players, policymakers, and researchers. The policymakers may devise financial policies by considering nonlinear aspect of finance–growth relationship. It is pertinent to note that *MS* model may provide information on transition probabilities, regime duration, regime classification, regime-specific mean, and volatility of financial market which is useful for designing monetary policy. This study, therefore, examines the regime-dependent role of financial development in economic growth in Pakistan. Pakistan is an interesting case study because Pakistan has replaced repressive financial structure with financial liberalization system since 1990s. However, the benefits of financial reforms could not be transferred toward the society at large. Thus, this study contributes to the existing literature by using the Markov regime-switching approach to examine the finance–growth

nexus for the period 1975–2017. In addition, use of single variable as proxy for financial development or various ratios to represent financial development may lead biased and spurious conclusions. Therefore, this study uses the financial development index (FDI) which was constructed using the principal component analysis (PCA). The FDI covers three key aspects associated to bank-based financial sector such as liquid liabilities relative to GDP, private sector credit relative to GDP, and commercial bank assets relative to central bank assets plus commercial bank assets.

The rest of this article is organized as follow: Section "Literature Review" presents a brief review of literature on finance–growth nexus. Section "Model Specification, Data and Methodology" deals with model specification, empirical methodology, variable description, and construction of FDI. Section "Empirical Findings" discusses empirical results, section "Conclusion" delineates conclusion of the study, while section "Policy Recommendations" presents policy recommendations and directions of future research.

Literature Review

Earlier literature on finance and growth showed positive correlation between the value of financial intermediaries assets and economic growth (Goldsmith, 1969). However, Goldsmith (1969) did not control other variables that may be jointly correlated with financial development and economic growth and did not test whether the link between financial development and economic growth works through productivity or capital accumulation (Levine, 2005). While controlling for initial income, government consumption, trade openness and school enrolment, King and Levine (1993) detected that the size of financial sector in 1960s significantly predicted economic growth, investment, and productivity growth. However, King and Levine (1993) did not determine the direction of causality between financial development and economic growth. The evidence on this aspect of finance–growth nexus were found by Levine et al. (2000) and Beck et al. (2000). They observed strong effect of exogenous components of financial development on long-term economic growth. Thus, their results indicate that financial development has a causal effect on economic growth. The studies that addressed causality issues (e.g., Guiso et al., 2004; Jayaratne & Strahan, 1996) detected positive effect of financial development on economic growth, entrepreneurship, and access to credit by smaller firms. Based on the literature survey, Levine (2005) concluded that the preponderance of evidence suggests that both financial intermediaries and financial markets matter for growth and found that reverse causality alone is deriving this relationship (Panizza, 2014).

However, empirical literature after financial crises 1997–1998 and 2007–2008 cast serious doubts on conclusions that financial development is necessary component of sustainable economic growth. For instance, Demetriades and Hussein (1996), Arestis and Demetriades (1997), Rousseau and Wachtel (2002), and Demetriades and Law (2006) detected no impact of financial development on economic growth. De Gregorio and Guidotti (1995) found negative correlation between financial depth and economic growth in the panel of Latin American countries. Based on threshold model, Deidda and Fattouh (2002) found support for the nonlinear effect of financial development on economic growth. Using Rajan and Zingales's (1998) dataset, Manganelli and Popov (2013) observed nonlinear effects of financial development on economic growth. In the same vein, Ductor and Grechyna (2015) suggested that the effect of financial development on economic growth becomes negative, if rapid growth in private credit is not accompanied by growth in real output. Ibrahim and Alagidede (2018) showed that below a certain estimated threshold level, finance is largely sensitive to economic growth, while significantly influencing economic growth for countries above the threshold. Swamy and Dharani (2019) found inverted U-shaped finance–growth relationship with the estimated threshold level of 142% of GDP. Based on panel Granger causality results, they concluded that financial development is associated with optimal growth performance in a panel of advanced economies. Asteriou and Spanos (2019) showed that before crisis financial development promoted economic growth in a panel of 26 European Union countries, while after the crisis it hindered economic growth.

Another strand of literature concluded that financial development contributed more to economic growth in developing countries. For example, Calderon and Liu (2003) suggested that financial development contributed more to economic growth in developing countries rather than industrialized countries. Masten et al. (2008) found similar results in a panel of European countries. They concluded that less developed countries gain more from financial sector development. Rioja and Valev (2004) observed strong positive relationship between financial development and economic growth only for countries with intermediate level of financial development. Beck et al. (2012) noted that positive effect of financial development on economic growth is predominantly driven by enterprise credit rather than consumer credit.

Based on the above literature review, we can deduce that the relationship between financial development and economic growth is inconclusive. This study, therefore, contributes to the empirical literature by examining the relationship between financial development and economic growth by employing Markov Switching modeling approach. This approach is useful in analyzing the regime-dependent impacts of financial development on economic growth.

Model Specification, Data, and Methodology

Model Specification

To examine the relationship between financial development and economic growth, we followed the modeling strategy of

Christopoulos and Tsionas (2004) and Khan (2008) and used following model for empirical investigation:

$$\begin{aligned} LRGDP_t = {} & \beta_0 + \beta_1 LFDI_t + \beta_2 LK_t \\ & + \beta_3 LLF_t + \beta_4 INF_t + \beta_5 LGEX_t \\ & + \beta_6 LOPEN_t + u_t \end{aligned} \quad (1)$$

where $LRGDP, LFDI, LK, LLF, INF, LGEX$, and $LOPEN$ denotes logarithmic values of real GDP per capita, FDI, physical capital, labor force, inflation, government expenditure as percentage of GDP, and trade openness as a percentage of GDP at time t, respectively. β's and u are, respectively, parameters and error term. Recent literature found a nonlinear relationship between financial development and economic growth (Arcand et al., 2015). The theoretical literature concluded two conflicting views regarding the impacts of financial liberalization on economic growth. In one view, financial liberalization strengthens financial development and has a positive effects on the performance of the real sector (Levine, 2005). In another view, financial liberalization induces excessive risk-taking, increases macroeconomic instability, and leads to more severe crises, which in turn negatively influence economic growth rate in the short and medium term (Allen & Carletti, 2006; Gennaioli et al., 2012; Masten et al., 2008; Ranciere et al., 2006). Another justification of nonmonotonic relationship could be that a fast-growing financial sector could generate high rents and attract funds that may be used in other sectors (Bolton et al., 2016; Philippon, 2010). Thus, sub-optimal allocation of resources may prevent from the achievement of feasible growth rates in the short-run. Rather, it is argued that the effects of financial development on economic growth could be weakened or even negative if there is unbalanced growth in the financial and real sectors (Ductor & Grechyna, 2015). We, therefore, hypothesize that financial development may or may not exert positive impact on economic growth. Besides financial development, labor force (LF) and physical capital stock (K) are the conventional determinants of economic growth. Skilled work force and physical capital facilitates to generate new products, ideas, and infrastructure, which underlies technological progress, thereby countries with substantial stock of skilled human and physical capital would grow faster (Ductor & Grechyna, 2015). We included inflation (INF) as a determinant of economic growth to capture the macroeconomic stability and business environment following Beck et al. (2000). An increase in inflation increases macroeconomic uncertainty, which in turn exerts negative impact on economic growth as well as hurt financial activities. Inflation reflects the effectiveness of the monetary policy and can affect economic growth through the channels of savings and investment decisions by households and firms. The ratio of government expenditures relative to GDP (GEX) is incorporated to measure the fiscal stability and distortions in the economy. The impact of GEX on economic growth in developing countries is generally negative due to distorting effects of taxation. Trade openness as a percentage of GDP ($OPEN$) is included to capture the importance of international factors in influencing economic activity. Higher level of exports relative to imports causes economic growth to increase but its effect in developing countries can also be negative.

Data

The present study is based on the annual data over the period 1975–2017. We used real GDP per capita as proxy of economic growth. The control variables include employed labor force (LF), physical capital (K) proxied by gross fixed capital formation as percentage of GDP, inflation (INF) is the average annual growth of the consumer price index (CPI) with 2010 as the base year, government expenditures as percentage of GDP (GEX), and sum of exports and imports as percentage of GDP is included as a measure of trade openness ($OPEN$). These variables have been extensively used by King and Levine (1993), Bist (2018), Ibrahim and Alagidede (2018), and Naveed and Mahmood (2019). The data on these variables have been collected from the World Development Indications (WDI), Pakistan Economic Survey (various issues), and annual reports of the State Bank of Pakistan.

Construction of FDI

Adu et al. (2013) argued that single proxy of financial development cannot adequately capture the effects of financial development. However, when numerous indicators of financial development are included in a single equation, this will create the problem of multicollinearity. To avoid these issues, researchers construct the financial development index (FDI). Therefore, we considered liquid liabilities of the financial system as percentage of GDP (LIQ), domestic credit to the private sector as percentage of GDP ($PVCR$), and commercial bank assets relative to central bank assets plus commercial bank assets ($DMBA$) to construct FDI. A number of researcher (Christopoulos & Tsionas, 2004; Demetriades & Hussein, 1996; King & Levine, 1993) used LIQ as a measure of financial depth which captures the size of financial intermediation. The LIQ is considered as broadest measure of financial depth as it captures three financial sector spheres, that is, the central bank, commercial banks, and other financial institutions. It also measures the relative size of the banking sector with that of the economy and is correlated with the quality of financial sector services. The second indicator of FDI is the credit to private sector as percentage of GDP ($PVCR$) that highlights utilization of credit and its allocation to more productive use by private sector. This indicator is considered as more accurate measure of savings that financial intermediaries channel to the private sector (Naceur & Ghazouani, 2007; Swamy & Dharani, 2019). Third important indicator of FDI is the commercial bank assets relative to

Table 1. Results of Financial Development Index.

Component	Eigenvalue	Difference	Proportion	Cumulative proportion
1	2.2490	1.6471	0.7497	0.7497
2	0.6019	0.4528	0.2006	0.9503
3	0.1491		0.0497	1.000
Principal components				
Variable	PC1	PC2	PC3	
LLIQ	0.6253	−0.2569	−0.7369	
LPVCR	0.4957	0.8601	0.1208	
LDMBA	0.6028	−0.4408	0.6651	

Note. *LLIQ* = log of liquid liabilities as percentage of GDP; *LPVCR* = log of bank private credit as percentage of GDP; *LDMBA* = log of commercial bank assets vs. commercial bank assets plus central bank assets; GDP = gross domestic product.

central bank assets plus commercial bank assets (*DMBA*). It measures the relative importance of central bank versus commercial banks in the financial sector. This indicator reveals that financial intermediaries took more risks to divert their resources toward different investment projects, share risks, and mobilize public savings than central banks. This indicator highlights the role of commercial banks and monetary authorities to channelize the assets for economic growth. To capture the impact of financial depth, financial intermediation, and household's savings allocations with financial institutions, we construct a composite *FDI* using the *PCA*. While constructing index it was our intention to incorporate the role of equity market and insurance sector as indicator of financial development but lack of similar period data restricted us.

Following Ang and McKibbin (2007), we selected the weights of first component, and these weights have been multiplied with the corresponding values of financial development score to obtain the single index that represent financial development in Pakistan. In equation (2), w_1 to w_3 are the weights associated to $LIQ, PVCR$, and $DMBA$ respectively.

$$FDI = w_1 LIQ + w_2 PVCR + w_3 DMBA \tag{2}$$

The results of the *PCA* are reported in Table 1.

It can be seen from Table 1 that first component captures almost 75% of the variations. Therefore, we plugged weights of first component (PC1) in equation (2) to obtain equation (3).

$$FDI = 0.6253 LIQ + 0.4957 PVCR + 0.6028 DMBA \tag{3}$$

The FDI for each year was calculated using equation (3).

Regime Switching Model

Several studies confirmed nonlinear impacts of financial development on economic growth (Arcand et al., 2015; Levine et al., 2000). It is worth mentioning here that linear models fail to capture the nonlinear impacts of financial development on economic growth. Therefore, the present study employs the MS model which is useful to switch the impact of financial development on economic growth between pre-reform and post-reform periods in Pakistan. The MS models are best suited to capture the effect of structural changes. Because of data limitations, we consider two-state MS model. We consider the mean (μ_{st}), variance (σ_{st}), and coefficient on FDI (β_{st}) as state-dependent parameters, while logarithmic values of labor force (LF), physical capital (K), government expenditures as percentage of GDP(GEX), trade openness as percentage of GDP ($OPEN$) and inflation (INF) as nonswitching dependent variables. All variables are assumed to follow stationary process.

In $MS(2)$ model, regime 0 ($S_t = 0$) is associated with higher average economic growth, while regime 1 ($S_t = 1$) is related to lower average economic growth in Pakistan. It is worth noting here that when economy is expanding due to financial sector development, the average growth in the economy is also expected to increase and volatility is assumed to be lower. However, when economy is in contractionary phase, the average growth is expected to be lower with higher volatility. Thus, $\mu_0 > \mu_1$ and $\sigma_0 < \sigma_1$, which indicates high-growth-low-volatility regime and vice versa. The specific form of $MS(2)$ model can be written as:

$$\Delta LRGDP_t = \mu_{st} + \beta_{st} \Delta LFDI_t + \sum_{i=1}^{5} \theta_i \Delta LX_{it} + u_{st} \tag{4}$$

In Equation (4), $\Delta LRGDP_t$ is the change in real GDP per capita, μ_{st} is the state-dependent intercept and $\Delta LFDI_t$ denotes sate-dependent variable, that is, FDI, whereas ΔX_{it} are the state-invariant variables, such as ΔLLF, ΔLK, ΔINF, $\Delta LGEX$, and $\Delta LOPEN$, while $u_{st} \sim N(0, \sigma_{st})$. The transition probabilities for $MS(2)$ model are given in Equation (5).

$$p_r = \begin{pmatrix} p_{00} & p_{01} \\ p_{10} & p_{11} \end{pmatrix} \text{ for } i = 0 \text{ and } 1 \tag{5}$$

where p_{00} and p_{11} are the probabilities of remaining in Regime 0 and Regime 1, respectively, whereas p_{01} and p_{02} indicating the movement of probabilities from high-growth

regime to low-growth regime, and vice versa. In addition, in the *MS* models, the state variable S_t depends on first-order Markov-switching process. The probability of a transition from *i*th regime in period $t-1$ to *j*th regime in period t is, therefore,

$$p_{ij} = \Pr\left(S_t = i \mid S_{t-1} = j\right), \quad \forall i, j \in (0,1) \tag{6}$$

In $MS(2)$ model, the means and variances are expected to behave as:

$$\mu_{st} = \begin{cases} \mu_0 > 0 \text{ and } \mu_1 < \mu_0 \text{ and } \sigma_0 < \sigma_1 \\ \mu_I \end{cases} \tag{7}$$

where $S_t = 0$ refers to high-average growth regime and $S_t = 1$ refers to low-average growth regime. Equation(s) (5) and (6) are generated by ergodic probabilities which are given in Equation(s) (8) to (11),

$$p_{00} = \Pr\begin{pmatrix} \text{High growth regime in } s_t \mid \\ \text{High growth regime in } s_{t-1} \end{pmatrix} \tag{8}$$

$$p_{01} = \Pr\begin{pmatrix} \text{High growth regime in } s_t \mid \\ \text{Low growth regime in } s_{t-1} \end{pmatrix} \tag{9}$$

$$p_{11} = \Pr\begin{pmatrix} \text{Low growth regime in } s_t \mid \\ \text{Low growth regime in } s_{t-1} \end{pmatrix} \tag{10}$$

$$p_{10} = \Pr\begin{pmatrix} \text{Low growth regime in s}_\text{t} \mid \\ \text{High growth regime in } s_{t-1} \end{pmatrix} \tag{11}$$

We have used more than 1000 starting values for estimated specification to optimize parameters globally. Besides, we considered the maximum log-likelihood ratio (LR) statistic, residual analysis, and Regime classification measure (*RCM*) to choose the appropriate model.

The *RCM* for $MS(2)$ model is given by equations (12).

$$RCM\left(M = 2\right) = 400 \times \frac{1}{T}\sum_{t=1}^{T} P_t\left(1 - P_t\right) \tag{12}$$

The value of RCM (ranges from 0 to 100) close to 0 reveals perfect regime classification, while it approaching to 100 means no regime classification.

Empirical Results and Discussion

Preliminary Investigation

We started our investigation with descriptive analysis and the results are reported in Table 2 (Panel A), whereas results with respect to correlation analysis are reported in Panel B of Table 2. The results indicate that the average change in all the variables is positive except for trade openness. The average growth in physical capital stock is relatively low as compared to labor force, indicating pivotal role of labor force in Pakistan economy. The statistics reveal that the highest level of economic growth was 0.065 that coincides to the year 1980, while the lowest level of economic growth was −0.015 which corresponds to the year 1997 when the economy was in the recession. Likewise, the average value of financial development was positive and equal to 0.014, indicating positive role of financial development in economic growth. The maximum value of financial development was 0.138, while the minimum value observed to be −0.207 that may be associated with repressed era. In addition, Inflation rate, government expenditures, trade openness, and financial development are relatively more volatile. Real GDP per capita and labor force has low volatility as indicated by the values of standard deviation. Likewise, financial development, physical capital, government expenditures, and trade openness have almost the same volatility. Only inflation rate is found highly volatile. Most of the variable possesses low mean with high volatility. Financial development is negatively skewed, whereas rest variables are positively skewed. The data have a heavier tails than normal distribution in case of financial development, physical capital, labor force, inflation, and government expenditures since the kurtosis is greater than three in all the cases. Thus, aforementioned series have leptokurtic distribution. Except labor force and government expenditures all other series are normally distribution as indicated by the significance of Jarque–Bera statistics.

It can be seen from Panel B of Table 2 that real GDP per capita is negatively correlated with labor force and inflation rate, whereas other variables have a positive correlation with real GDP per capita. More importantly, we observed positive correlation between financial development and real GDP per capita. However, correlation coefficient of financial development with real GDP per capita is relatively low as compared to other variables. The physical capital and government expenditures have relatively high positive correlation with real GDP per capita, while financial development has a negative correlation with government expenditures and inflation rate.

To check nonlinearity in the finance–growth relationship, we employed the Brock et al.'s (1987) test (Brock, Dechert, and Scheinkman [BDS] test). The BDS test indicates that an increment to a data series is independent and identically distributed (*iid*). The BDS test is based on the correlation that measures frequency with which temporal patterns are repeated in the data. The rejection of the null hypothesis reveals that the data are *iid*, and hence, the relationship is nonlinear. Table 3 reports the results of the BDS test.

It is evident from Table 3 that the relationship is nonlinear because all the dimensions are significant at 1% level of significance. Therefore, we can use *MS* model to investigate the relationship between finance and growth. Since *MS* model requires that all the variables under consideration must be stationary. We, therefore, applied Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests to determine stationarity of the variable(s). In addition, to check the

Table 2. Descriptive Statistics and Correlation Analysis.

Panel A	ΔLRGDP	ΔLFDI	ΔLK	ΔLLF	ΔLOPEN	ΔLGEX	ΔINF
M	0.022	0.014	0.001	0.026	−0.005	0.010	7.770
Maximum	0.065	0.138	0.177	0.092	0.149	0.387	18.470
Minimum	−0.015	−0.207	−0.126	−0.038	−0.128	−0.129	2.498
SD	0.018	0.069	0.066	0.021	0.076	0.090	3.403
Skewness	0.143	−0.624	0.538	0.151	0.202	1.783	0.627
Kurtosis	2.619	3.948	3.475	5.906	2.217	8.609	3.587
JB	0.398	4.302	2.423	14.934***	1.358	77.316***	3.359
Panel B							
ΔLRGDP	1.000						
ΔLFDI	0.008	1.000					
ΔLK	0.292***	0.424***	1.000				
ΔLLF	−0.050	0.121	−0.061	1.000			
ΔLOPEN	0.148	0.327***	0.353***	0.032	1.000		
ΔLGEX	0.153	−0.122	0.085	0.321***	0.056	1.000	
ΔINF	−0.216	−0.451***	−0.194	0.035	−0.166	−0.192	1.000

Note. JB = Jarque–Bera.
***The 1% level of significance.

Table 3. Results of BDS Test.

Dimension	BDS statistic	*Z* statistic	*p* value
2	0.080	8.23	.000***
4	0.188	10.00	.000***
6	0.211	10.90	.000***

Note. The *p*-values are based on bootstrap with 100,000 replications using standard deviation. The null hypothesis is that series are linearly dependent. BDS = Brock, Dechert, and Scheinkman.
***The 1% level of significance.

possibility of structural breaks in the data, we also employed Lee and Strazicich's (2003) structural break unit root test. The results of the unit root tests are reported in Table 4.

The results of the ADF and PP unit root statistics show that all the differenced variables are stationary, that is $I(0)$, at appropriate level of significance. Furthermore, no structural break was detected in the levels of all variables as indicated by the Lee and Strazicich (2003) structural break test.

Regime Switching Model

The impact of financial development on economic growth was investigated using the Markov switching framework. To avoid estimation of a large number of parameters when the number of regimes increases, we consider a parsimonious state-dependent finance-growth model with two regimes (Ayadi et al., 2018). This choice is also more intuitive to interpret empirical results because the behavior of economic growth is generally depending on the trends of the economy, such as a high- or low-growth regimes. Fallahi (2011) documented that $MS(2)$ model better fits the macroeconomic relationships. However, for the comparison purposes, we estimated a linear finance–growth relationship and $MS(3)$ model as benchmark model. The descriptive statistics and the diagnostic tests based on the residuals obtained from the estimation of linear, $MS(2)$ and $MS(3)$ models are reported in Table 5. These statistics show that the linear and $MS(2)$ models performed well as indicated by the insignificance of the Jarque–Bera statistic of normality, ARCH test of heteroscedasticity, and Ljung-Box-$Q(12)$ and $Q^2(12)$ statistics. Furthermore, the value of RCM was 1.8945, which is closer to zero, confirming that $MS(2)$ model is a true data generating process (DGP) as compared to $MS(3)$ model. On the basis of diagnostic tests and the value of RCM, we can infer that $MS(2)$ better fits the data with regard to the relationship between financial development and economic growth in Pakistan for the period 1975–2017. Thus, we will consider $MS(2)$ model for further analysis.

To investigate the relationship between financial development and economic growth, we considered $MS(2)$ model and the results are reported in Table 6.

The results reported in Table 6 show that in case of $MS(2)$ model, the estimated parameters (μ_0, μ_1, σ_0, and σ_1) are statistically significant at 1% level of significance. Regime 0 is characterized as high-growth regime where economic activities expand significantly. For example, regime 0 has the higher value of the intercept term, $\mu_0 = 0.044$, with lower volatility, $\sigma_0 = 0.003$. High value of intercept term with lower volatility suggests that regime 0 coincides with a period of economic expansion. Regime 1 corresponds to a period of low growth where the estimated value of the intercept term is $\mu_1 = 0.016$, and value of variance is $\sigma_1 = 0.014$, which is relatively higher. Thus, the result indicates that $\mu_0 > \mu_1$ with $\sigma_0 < \sigma_1$. Based on the values of intercept terms and variances, the results confirm that Regime 0 corresponds to high growth with lower volatility and Regime 1 coincides to low growth with higher volatility. Thus, we can infer that

Table 4. Results of Unit Root Tests.

				Lee and Strazicich test	
Variable	Specification	ADF-test	PP-test	Break model	Break date
LRGDP	*C*	−1.185	−1.239	−5.271	[1995, 2004]
Δ*LRGDP*	*C*	−4.682***	−4.651**	−6.187**	[1996, 2005]
LFDI	*C*	−1.637	−1.847	−5.189	[1993, 2007]
Δ*LFDI*	*C*	−4.385***	−4.384***	−9.002***	[1998, 2001]
LK	*C*	−2.093	−2.283	−4.799	[1996, 2007]
Δ*LK*	*C*	−6.220***	−6.288***	−6.028*	[2004, 2008]
LLF	*C*	−0.678	−0.675	−4.29	[1989, 2006]
Δ*LLF*	*C*	−6.128***	−6.127***	−8.022***	[1989, 2004]
LOPEN	*C*	−1.700	−1.681	−5.540	[1987, 2013]
Δ*LOPEN*	*C*	−6.548***	−6.550***	−6.814**	[1987, 2001]
LGEX	*C*	−2.049	−2.053	−4.40	[1986, 1999]
Δ*LGEX*	*C*	−6.961***	−7.045***	−7.627***	[1987, 1992]
INF	*C*	−4.040***	−4.412***	−5.169	[1991, 2006]

Note. Δ denotes first difference of the variables.
***, **, and *1%, 5%, and 10% level of significance. In Lee and Strazicich (2003) structural break test, we applied crash model with a single break. Values in [.] are the break dates. C stands for constant term. ADF = Augmented Dickey–Fuller; PP = Phillips–Perron.

Table 5. Residual Analysis of *MS* Model.

Statistic	Linear	*MS*(2)	*MS*(3)
M	0.0000	−2.9042e–006	−2.0432e–005
SD	1.0000	0.91668	0.94094
Skewness	0.55003	0.057204	0.95909
Excess Kurtosis	−0.32396	−0.64022	1.4812
Log-Likelihood	113.6283	121.9113	134.2492
LR Linearity test	—	24.6758	41.242
Approximate upper bound	—	0.004**	0.000***
ARCH 1–12 test	0.35726 [0.953]	0.28125 [0.967]	0.34224 [0.565]
Q(12)	11.911 [0.453]	16.509[0.169]	4.4965 [0.973]
$Q^2(12)$	9.0726 [0.698]	10.604 [0.563]	22.854 [0.029]*
Jarque–Bera	2.3014 [0.316]	0.74020 [0.691]	10.279 [0.006]**
RCM	—	1.895[a]	20.443

Note. LR = log-likelihood ratio; M = mean; SD = standard deviation.
[a]Model is selected based on *RCM*.
***,** and * indicates significant at the 1%, 5% and 10% level of significance, respectively. Values in [.] are the *p*-values.

high-growth regime is less volatile than low-growth regime. In case of *MS*(2) model, the transition probabilities indicate that high-growth regime is more persistent than that of low-growth regime because $p_{00} > p_{11}$ (that is, $0.8529 > 0.6650$). The result also reveals higher chances of reversion from low-growth regime to high-growth regime because $p_{10} > p_{01}$ (that is, $0.3350 > 0.1471$).

With regard to regression parameters, the result reveals that *FDI* exerts a negative and significant impact on economic growth in both the regimes. Most importantly, the response of economic growth to changes in financial development is different in Regime 0 and Regime 1. For instance, in Regime 0 which is characterized as high-growth regime, a 1% increase in financial development would reduce economic growth by 0.147%, whereas economic growth would reduce by 0.119% in response to a 1% increase in financial development in Regime 1, which coincides with low-growth regime. (For robustness, we have also splitted the sample into two sub-periods [that is, before and after 1990s] to verify the impact of financial development on economic growth in both period. However, we got negative and insignificant coefficient of financial development for both prior and after 1990s period.) The negative relationship of financial development with real GDP per capita contradicts the theoretical predictions that financial development enhances economic growth. This finding is inconsistent with Khan (2008), Lal et al. (2009), Jalil and Feridun (2011), Shahbaz et al. (2017), Farooq et al. (2013), and

Table 6. Results of Linear and *MS* Models (1975–2017).

	Dependent variable: $\Delta LRGDP$		
	Specification		
Variable	Linear	MS(2)	MS(3)
M (μ_0)	0.033***	0.044***	0.034***
	(4.75)	(10.00)	(3.63)
M (μ_1)		0.016***	0.017***
		(4.37)	(4.92)
M (μ_2)			0.059***
			(20.2)
Variance (σ_0)	0.016	0.003***	0.001***
Variance (σ_1)		0.014***	0.008*
Variance (σ_2)			0.011***
$\Delta LFDI_0$	−0.068	−0.147***	0.062***
	(−1.40)	(−2.60)	(15.7)
$\Delta LFDI_1$	—	−0.119***	−0.089***
		(−5.10)	(−3.05)
$\Delta LFDI_2$	—	—	−0.227***
			(−5.15)
ΔLK (θ_1)	0.087**	0.089***	0.011**
	(2.02)	(4.72)	(1.72)
ΔLLF (θ_2)	−0.006	−0.090**	−0.329***
	(−0.050)	(−1.82)	(−10.9)
$\Delta LOPEN$ (θ_3)	0.018	−0.003	0.062***
	(0.443)	(−0.095)	(22.5)
$\Delta LGEX$ (θ_4)	0.009	−0.025	−0.012***
	(0.269)	(−1.55)	(−3.52)
INF (θ_5)	−0.001	−0.001***	−0.001
	(−1.58)	(−2.96)	(−0.437)
Probabilities Matrix	—	$\begin{pmatrix} 0.8529 & 0.1471 \\ 0.3350 & 0.6650 \end{pmatrix}$	—

Note. Values in (.) are the *t*-statistics. 0 and 1 in subscripts indicate Regimes 1 and 2, respectively.
***, **, and * indicates 1%, 5%, and 10% level of significance, respectively.

Naveed and Mahmood (2019) in case of Pakistan. However, differential responses of economic growth to financial development endorses the view that the relationship between financial development and economic growth is nonmonotonic and regime dependent in countries like Pakistan. (It is added that whenever productivity increasing effect of financial development is larger than the productivity decreasing effect, there may be nonmonotonic relationship between financial development and economic growth.) One reason of negative relationship between financial development and economic growth could be the use of nonlinear estimation technique. The other reason may the faster growth of financial sector relative to the growth of real sector of Pakistan economy. Ductor and Grechyna (2015) confirmed that the effect of financial development on economic growth depends on the growth rates of financial system relative to real sector of the economy. Ang and McKibbin (2007) found that the outcome of financial development with respect to economic growth is dependent on investment-saving relationship. If savings are not utilized in productive activities, then financial development impedes economic growth. High transaction costs in developing countries also outweigh the positive effect of financial development on economic growth. Singh (1997) documented that credit markets promote economic growth if loans are monitored properly. Otherwise, it will lead to loan losses and cause financial crises, which in turn harm the real economic activity. McKinnon (1973) and Shaw (1973) argued that if saving rate rises with the interest rate, then capital market imperfections may lower economic growth by depressing savings. In Pakistan, majority of financial intermediaries place their savings toward risk-free projects such as investment in T-Bills, financing to government borrowings, and investments in nonentrepreneurial projects. Particularly, government borrowings from the banking system may crowd-out private investment and hence impedes economic growth. Another reason could be the overall deteriorating industrial and business environment due to energy crisis owing to which financial development retards economic growth in Pakistan. In the presence of energy crises,

Table 7. Duration of Regime Classification and Smoothed Probabilities of MS(2) Model.

Regime 0 (high-growth regime)			Regime 1 (low-growth regime)		
Period	No. of years	Average probability	Period	No. of years	Average probability
1976–1978	3	1.000	1979–1979	1	0.676
1980–1988	9	1.000	1989–1991	3	0.932
1992–1992	1	1.000	1993–1993	1	0.601
1994–1996	3	0.999	1997–2001	5	0.955
2002–2007	6	1.000	2008–2012	5	0.921
2013–2017	5	0.998			
Duration of regime classification					
Years		27		17	
In percentage		64.29%		35.71%	
Average duration		4.50 years		3.00 years	

business community hardly able to manage high cost of financing, which in turn retards economic growth. Poor quality institutions may be another cause of a negative relationship between financial development and economic growth. In addition, negative external shocks also limit commercial banks to expand investment activities. Dell'Ariccia and Marquez (2006) argued that financial liberalization is always associated with speculative bubbles, excess liquidity, financial crises, and low growth in the short run. Negative relationship between financial development and economic growth is consistent with Hye (2011), (Xu, 2000), Wu et al. (2010), and Swamy and Dharani (2019). Naveed and Mahmood (2019) also found negative impact of financial liberalization on economic growth in the short-run in case of Pakistan. They concluded that elimination of interest rate controls leads to increase savings, but a decrease in aggregate demand exerted negative impact on economic growth in the short run.

Among nonswitching variables (see Table 6), the results reveal that physical capital exerts significant positive impact on economic growth. The results confirm that with a 1% increase in physical capital, the level of economic growth would increase by 0.089%. The positive relationship of physical capital with economic growth is consistent with the findings of Jalil and Feridun (2011), Qureshi and Ahmed (2012), and Naveed and Mahmood (2019). Labor force has significant negative relation with economic growth. The result shows that a 1% increase in the labor force causes economic growth to decrease by 0.090%. The negative influence of the labor force on economic growth is not surprising because Pakistan is a labor-abundant country and a major proportion of labor force is unskilled. Our results are consistent with those of Ali and Mustafa (2012) and Bist (2018). Growth of government expenditures and trade openness exerted negative but insignificant impact on economic growth. The insignificance of trade openness is an indicative of weak performance of Pakistan economy in the international market. Likewise, insignificance of government expenditures could be attributed to the overall role of government agencies in expanding economic growth. We also observed a negative and significant effect of inflation on economic growth in Pakistan, which shows that a 1% increase in inflation leads to decrease economic growth by 0.001%. Although the effect of inflation on economic growth is negligible, but its negative effect on financial development is more severe (Rousseau & Yilmazkuday, 2009). Increase in inflation restricts economic growth as it is associated with repressive policies.

The outcome of regimes classification with reference to the high-growth and low-growth regimes is presented in Table 7.

It is evident from Table 7 that both regimes are persistent because the estimated transition probabilities are greater than 0.5. For example, there is 64.29% probability of staying in the high-growth regime, which is higher than the probability of staying in the low-growth regime (that is, 35.71%). This implies that high-growth regime is more persistent than low-growth regime. The behavior of smoothed probabilities is depicted in Figure 1, which confirms that smoothed probabilities are persistent.

Conclusion and Recommendations

This study examines the relationship between financial development and economic growth under the Markov regime-switching framework in Pakistan for the period 1975–2017. The empirical analysis is based on two-state Markov switching model. Using the PCA, we have constructed FDI by considering liquid liabilities as percentage of GDP, private credit as a percentage of GDP, and commercial bank assets as a ratio of commercial bank assets plus central bank assets.

The results support the existence of nonlinear relationship between financial development and economic growth in Pakistan. The findings reveal an evidence of high growth with low volatility in the high-growth regime, while low

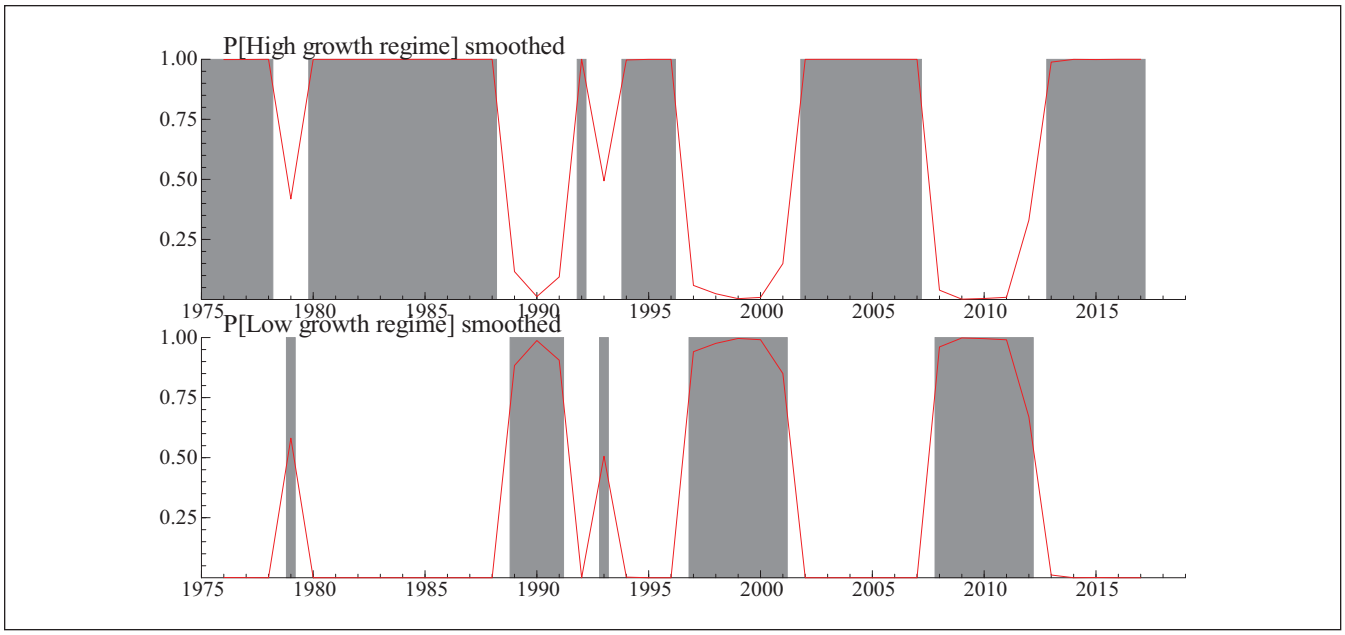

Figure 1. Smoothed probabilities of *MS*(2) model of finance–growth nexus.

growth was associated with high volatility. Furthermore, financial development exerts negative and significant impact on economic growth per capita in high- and in low-growth regimes. In the high-growth regime, the absolute effect of financial development on economic growth is more than that of in low-growth regime. These results confirm the presence of nonlinearities in finance–growth relationship in Pakistan. The negative effect of financial development on economic growth could be that financial liberalization may lead to fragility and financial crises, which in turn have severe recessionary effects on economic growth. Therefore, the State Bank of Pakistan may introduce protective measures that may undermine incidence of financial fragility and financial crises on economic growth. Among the non-switching variables, labor force contributes negatively to economic growth. Therefore, there is a need to improve the quality of labor force through technical education and training. The physical capital is positively contributing to economic growth in Pakistan. The contribution of trade openness and government expenditures in economic growth observed to be insignificant. Therefore, policymakers may take necessary steps to increase the exports of goods and services by adopting export-led strategies. Furthermore, policies on better utilization of government expenditures may be familiarized so that fungibility practices may vanish. With these steps, both trade openness and government expenditures would contribute to economic growth. With respect to smoothed probabilities and regimes classification, we observed that the high-growth regime is relatively long-lived during the period 1975–2017. This indicates that during the period 1975–2017, growth of physical capital played a key role in enhancing economic growth in Pakistan. Therefore, policymakers may take appropriate measures to boost the growth of physical capital to achieve sustainable economic growth.

Policy Implications and Future Research Direction

The empirical findings of this study could offer implications for prudent macroeconomic policy regulations. The financial development exerts negative impact on economic growth in both the regimes. However, the response of economic growth to change in financial development is heterogeneous in the high- and low-growth regime. Therefore, the policymakers may consider nonlinear aspect of financial development in formulation of credit and monetary policies. Furthermore, State Bank of Pakistan may take appropriate initiative to balance the growth of financial sector and the growth of real sector of the economy. The findings suggest that the role of physical capital in promoting economic growth is important since financial development alone cannot drive the path for economic growth. Therefore, policymakers may frame policies that enhance capital accumulation, which is considered as an important component of economic growth.

Although, the present study offers insightful information with respect to finance-growth nexus in Pakistan based on the regime switching framework. However, the findings are subject to some limitations. The effect of financial development, following sudden changes in the political regime, would be interesting to study. It would also be more interesting to test the finance-growth nexus using the cross-country panel data. It would be more insightful to investigate the responses of economic growth to financial development using the quantile regression approach. We leave this for future research.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD


Abdul Rahman https://orcid.org/0000-0003-1893-9756

References

Abu-Bader, S., & Abu-Qarn, A. S. (2008). Financial development and economic growth: Evidence from six MENA countries. *Review of Development Economics*, *12*(4), 803–817.

Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? *Review of Development Finance*, *3*(4), 192–203.

Ali, H., & Bhutta, Z. M. (2018). Financial development and economic growth nexus in Pakistan: An analysis of bound testing approach. *Sukkur IBA Journal of Economics and Finance*, *2*(1), 10–35.

Ali, R., & Mustafa, U. (2012). External debt accumulation and its impact on economic growth in Pakistan. *The Pakistan Development Review*, *51*(4), 79–96.

Allen, F., & Carletti, E. (2006). Credit risk transfer and contagion. *Journal of Monetary Economics*, *53*(1), 89–111.

Amjad, R. (2014). Pakistan's growth spurts and reversals: A historical perspective. *The Lahore Journal of Economics*, *19*, 91–104.

Ang, J. B., & McKibbin, W. J. (2007). Financial liberalization, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics*, *84*(1), 215–233.

Arcand, J. L., Berkes, E., & Panizza, U. (2015). Too much finance? *Journal of Economic Growth*, *20*(2), 105–148.

Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *The Economic Journal*, *107*(442), 783–799.

Asteriou, D., & Spanos, K. (2019). The relationship between financial development and economic growth during the recent crisis: Evidence from the EU. *Finance Research Letters*, *28*, 238–245.

Ayadi, M. A., Lazrak, S., Liao, Y., & Welch, R. (2018). Performance of fixed-income mutual funds with regime-switching models. *The Quarterly Review of Economics and Finance*, *69*, 217–231.

Beck, T. (2008). *The econometrics of finance and growth* (World Bank Policy Research Working Paper No. 4608.). https://ideas.repec.org/p/wbk/wbrwps/4608.html

Beck, T., Buyukkaraback, B., Rioja, F. K., & Valve, N. T. (2012). Who gets the credit? And does it matter? Household vs. firm lending across countries. *The B. E. Journal of Macroeconomics*, *12*, 1–46.

Beck, T., Chen, T., Lin, C., & Song, F. M. (2016). Financial innovation: The bright and the dark sides. *Journal of Banking & Finance*, *72*, 28–51.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics*, *58*(1–2), 261–300.

Benczur, P., Karagiannis, S., & Kvedaras, V. (2019). Finance and economic growth: Financing structure and non-linear impact. *Journal of Macroeconomics*, *62*, 103048.

Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics & Finance*, *6*(1), Article 1449780.

Bolton, P., Santos, T., & Scheinkman, J. A. (2016). Cream-skimming in financial markets. *The Journal of Finance*, *71*(2), 709–736.

Brock, W. A., Dechert, W. D., & Scheinkman, J. A. (1987). *A test for independence based on the correlation dimension* (Working Paper No. 870). Social Systems Research Institute, University of Wisconsin–Madison.

Brooks, C. (2014). *Introductory econometrics for finance* (3rd ed.). Cambridge University Press.

Calderon, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, *72*(1), 321–334.

Caporale, G. M., Rault, C., Sova, A. D., & Sova, R. (2014). Financial development and economic growth: Evidence from 10 new European Union members. *International Journal of Finance & Economics*, *20*(1), 48–60.

Cecchetti, S. G., & Kharroubi, E. (2012). *Reassessing the impact of finance on growth* (Bank for International Settlements Working Paper No. 381). https://www.bis.org/publ/work381.pdf

Chandavarkar, A. (1992). Of finance and development: Neglected and unsettled questions. *World Development*, *20*(1), 133–142.

Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit root and co-integration tests. *Journal of Development Economics*, *73*, 55–74.

Chung, P. T., Sun, S., & Hong Vo, D. T. (2019). How does financial development intract with economic growth in five ASEAN countries? *The Singapore Economic Review*, *64*(3), 441–460.

Comin, D., & Nanda, R. (2019). Financial development and technology diffusion. *IMF Economic Review*, *67*(2), 395–419.

De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World Development*, *23*(3), 433–448.

Deidda, L., & Fattouh, B. (2002). Non-linearity between finance and growth. *Economics Letters*, *74*(3), 339–345.

Dell'Ariccia, G., & Marquez, R. (2006). Lending booms and lending standards. *The Journal of Finance*, *61*(5), 2511–2546.

Demetriades, P. O., & Law, S. H. (2006). Finance, institutions and economic development. *International Journal of Finance & Economics*, *11*(3), 245–260.

Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time series evidences from 16 countries. *Journal of Development Economics*, *51*, 387–411.

Ductor, L., & Grechyna, D. (2015). Financial development, real sector, and economic growth. *International Review of Economics &Finance*, *37*, 393–405.

Fallahi, F. (2011). Causal relationship between energy consumption (EC) and GDP: A Markov-switching (MS) causality. *Energy*, *36*(7), 4165–4170.

Farooq, A., Shahbaz, M., Arouri, M., & Teulon, F. (2013). Does corruption impede economic growth in Pakistan? *Economic Modelling*, *35*, 622–633.

Gennaioli, N., Shleifer, A., & Vishny, R. (2012). Neglected risks, financial innovation, and financial fragility. *Journal of Financial Economics*, *104*(3), 452–468.

Goldsmith, R. (1969). *Financial structure and development*. Yale University Press.

Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *European Economic Review*, *35*(2–3), 517–526.

Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. *American Economic Review*, *94*(3), 526–556.

Gurley, J. G., & Shaw, E. S. (1955). Financial aspects of economic development. *The American Economic Review*, *45*(4), 515–538.

Hye, M. A. Q. (2011). Financial development index and economic growth: Empirical evidence from India. *The Journal of Risk Finance*, *12*(2), 98–111.

Ibrahim, M., & Alagidede, P. (2018). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling*, *40*(6), 1104–1125.

Jalil, A., & Feridun, M. (2011). Impact of financial development on economic growth: Empirical evidence from Pakistan. *Journal of the Asia Pacific Economy*, *16*(1), 71–80.

Jalil, A., & Ma, Y. (2008). Financial development and economic growth: Time series evidence from Pakistan and China. *Journal of Economic Cooperation*, *29*(2), 29–68.

Jayaratne, J., & Strahan, P. E. (1996). The finance-growth nexus: Evidence from bank branch deregulation. *The Quarterly Journal of Economics*, *111*(3), 639–670.

Khan, M. A. (2008). Financial development and economic growth in Pakistan: Evidence based on autoregressive distributed lag (ARDL) approach. *South Asia Economic Journal*, *9*(2), 375–391.

Khan, M. A., Ahmed, M., & Bibi, S. (2019). Financial development and economic growth nexus for Pakistan: A revisit using maximum entropy bootstrap approach. *Empirical Economics*, *57*(4), 1157–1169.

Khan, M. A., Qayyum, A., & Sheikh, S. (2005). Financial development and economic growth: The case of Pakistan. *The Pakistan Development Review*, *44*(4), 819–837.

Khan, M. M. S., & Senhadji, M. A. S. (2000). *Financial development and economic growth: An overview* (IMF Working Paper No. WP /00/29). International Monetary Fund.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, *108*(3), 717–737.

Lal, I., Muhammad, S. D., Hussain, A., & Jalil, M. A. (2009). Effects of financial structure and financial development on economic growth: A case study of Pakistan. *European Journal of Social Sciences*, *11*(3), 419–428.

Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking & Finance*, *41*, 36–44.

Lee, J., & Strazicich, M. C. (2003). Minimum Lagrange multiplier unit root test with two structural breaks. *The Review of Economics and Statistics*, *85*(4), 1082–1089.

Levine, R. (1997). Financial development and economic growth: Views and Agenda. *Journal of Economic Literature*, *35*(2), 688–726.

Levine, R. (2005). Finance and growth: Theory and evidence. *Handbook of Economic Growth*, *1*, 865–934.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, *46*(1), 31–77.

Levine, R., & Zervos, S. (1998). Stock markets, banks and economic growth. *The American Economic Review*, *88*(3), 537–558.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, *22*, 3–42.

Mahmood, A. (2013). Impact of financial development on the economic growth of Pakistan. *Abasyn Journal of Social Sciences*, *6*(2), 106–116.

Manganelli, S., & Popov, A. (2013). Financial dependence, global growth opportunities, and growth revisited. *Economics Letters*, *120*(1), 123–125.

Masten, A. B., Coricelli, F., & Masten, I. (2008). Non-linear growth effects of financial development: Does financial integration matter? *Journal of International Money and Finance*, *27*(2), 295–313.

McKinnon, R. I. (1973). *Money and capital in economic development*. Brookings Institution.

Mian, A., & Sufi, A. (2014). *House of debt: How they (and you) caused the Great Recession, and how we can prevent it from happening again*. The University of Chicago Press.

Naceur, S. B., & Ghazouani, S. (2007). Stock markets, banks, and economic growth: Empirical evidence from the MENA region. *Research in International Business and Finance*, *21*, 297–315.

Naveed, S., & Mahmood, Z. (20197). Impact of domestic financial liberalization on economic growth in Pakistan. *Journal of Economic Policy Reform*, *22*(1), 1–19.

Odhiambo, N. M. (2004). Is financial development still a spur to economic growth? A causal evidence from South Africa. *Savings and Development*, *28*(1), 47–62.

Panizza, U. (2014). Financial development and economic growth: Known knowns, known unknowns, and unknown unknowns. *Revue d'économie du développement*, *22*(HS02), 35–65.

Philippon, T. (2010). Financiers versus engineers: Should the financial sector be taxed or subsidized? *American Economic Journal: Macroeconomics*, *2*(3), 158–182.

Qureshi, M. G., & Ahmed, E. (2012). *The Inter-linkages between democracy and per capita GDP growth: A cross-country analysis* (PIDE Working Papers 2012:85). Pakistan Institute of Development Economics.

Rajan, R. G., & Zingales, L. (1998). Financial dependence and growth. *The American Economic Review*, *88*(3), 559–586.

Ranciere, R., Tornell, A., & Westermann, F. (2006). Decomposing the effects of financial liberalization: Crises vs. growth. *Journal of Banking & Finance*, *30*(12), 3331–3348.

Rioja, F., & Valev, N. (2004). Does one size fit all?:A reexamination of the finance and growth relationship. *Journal of Development Economics*, *74*(2), 429–447.

Robinson, J. (1952). The generalization of the general theory. In *The rate of interest and other essays* (pp. 134–165). London: Palgrave Macmillan.

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, *98*(5), S71–S102.

Rousseau, P. L., & Wachtel, P. (2002). Inflation thresholds and the finance–growth nexus. *Journal of International Money and Finance*, *21*(6), 777–793.

Rousseau, P. L., & Yilmazkuday, H. (2009). Inflation, financial development, and growth: A trilateral analysis. *Economic Systems*, *33*(4), 310–324.

Ruiz, J. L. (2018). Financial development, institutional investors, and economic growth. *International Review of Economics & Finance*, *54*, 218–224.

Samargandi, N., Fidrmuc, J., & Ghosh, S. (2014). Financial development and economic growth in an oil-rich economy: The case of Saudi Arabia. *Economic Modelling*, *43*, 267–278.

Schularick, M., & Taylor, A. M. (2012). Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870–2008. *American Economic Review*, *102*(2), 1029–1061.

Schumpeter, J. (1911). *The theory of economic development: An inquiry into profits, capital, credit, interest and business cycle*. Harvard University Press.

Shahbaz, M., Kandil, M., Kumar, M., & Nguyen, D. K. (2017). The drivers of economic growth in China and India: Globalization or financial development. *International Journal of Development Issues*, *16*(1), 54–84.

Shaw, E. S. (1973). *Financial deepening in economic development*. Oxford University Press.

Shen, C. H., & Lee, C. C. (2006). Same financial development yet different economic growth: Why? *Journal of Money, Credit & Banking*, *38*(7), 1907–1944.

Singh, A. (1997). Financial liberalization, stock markets and economic development. *The Economic Journal*, *107*(442), 771–782.

Swamy, V., & Dharani, M. (2019). The dynamic of finance-growth nexus in advanced economies. *International Review of Economics & Finance*, *64*, 122–146.

Tahir, M. (2008). An investigation of the effectiveness of financial development in Pakistan. *Lahore Journal of Economics*, *13*(2), 27–44.

Uppal, J. Y., & Mangla, I. U. (2018). Role of financial services in economic growth: Policy implications for Pakistan. *Lahore Journal of Economics*, *23*(2), 69–108.

Wu, J.-L., Hou, H., & Cheng, S.-Y. (2010). The dynamic impacts of financial institutions on economic growth: Evidence from the European Union. *Journal of Macroeconomics*, *32*(3), 879–891.

Xu, Z. (2000). Financial development, investment, and economic growth. *Economic Inquiry*, *38*(2), 331–344.

Zhao, S. (2017). Does financial development necessarily lead to economic growth? Evidence from China's cities, 2007–2014. In *13th global congress on manufacturing and management* (Vol. 100, p. 05032). EDP Sciences.

Zivot, E., & Wang, J. (2007). *Modeling financial time series with S-Plus®* (Vol. 191). Springer Science & Business Media.