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TÍTULO: Evidencia empírica del desarrollo del sector bancario y el crecimiento económico en Pakistán: un enfoque de serie temporal.

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RESUMEN: El estudio investiga el efecto a largo plazo del sector bancario en el progreso económico de Pakistán. En la aplicación del método de cointegración de Johansen en datos de series temporales para 1980-2018 encontramos una relación de cointegración estable para Pakistán. Los resultados indican que en el desarrollo del sector bancario, las remesas se relacionan positivamente con el crecimiento económico, y la tasa del mercado monetario (MMR) utilizada como sustituto de la tasa de interés se relacionó negativamente con el progreso económico. La evidencia demuestra promover el crecimiento, y que las políticas a largo plazo deben orientarse hacia la mejora de la inversión y el entorno del sector bancario, respaldado por las innovaciones tecnológicas. Los resultados respaldan una fuerte evidencia y un papel positivo de los factores reales de los indicadores de desarrollo del sector bancario con el crecimiento económico de Pakistán.

PALABRAS CLAVES: sector bancario, crecimiento económico, cointegración, remesas, tasa del mercado monetario y Pakistán.

TITLE: Empirical evidence of Banking Sector Development and Economic Growth in Pakistan: A Time Series Approach.

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ABSTRACT: The study purpose was to investigate the long-term effect of the Banking sector on economic progress of Pakistan. In the application of Johansen Cointegration method on time series data for 1980-2018, we found stable cointegration relationship for Pakistan. Results indicate that the Banking sector development (BSD) proxied by Advances, Remittances are positively related with economic growth while money market rate (MMR) used as substitute for interest rate was negatively related with economic progress. Evidence demonstrates consistent nature of the banking sector-growth nexus, suggesting that for promoting growth, long-run policies should be geared towards improving banking sector investment and environment supported by technological innovations. The results support strong evidence and positive role of real factors of banking sector development indicators with economic growth for Pakistan.

KEY WORDS: banking sector, economic growth, co-integration, Remittances, Money market Rate and Pakistan.

INTRODUCTION.

Economic growth and development of any economy depends on many sectors, including agricultural, industrial and services sectors and within these the most contributing sector is the financial sector of a country.

Many empirical studies showed a strong and crucial link among the financial sector of the economy and the economic growth. The seminal work of McKinnon (1973), Shaw (1973) and Goldsmith (1996) about association among financial expansion and economic progress had remained a vital source of argument in the emerging economies. In financial sector, most important sector is the banking sector.

In Pakistan, the major sources of finance are the commercial banks, Islamic banks, private Enterprises, and Investing Institutes. However, developing institutions insurance companies, provident funds companies and takaful operator are also playing important role. In Pakistan, during the last a few decades, many reforms have been introduced by the monetary authorities and government which accelerated the performance of banking sector in the country.

The course of connectedness that runs among credit market expansion and the economic progress for 1980-2008 had been investigated by Mishra *et al.*, (2009). They used the Gross Domestic Product (GDP) and Bank Credit as variables. They employed the Granger Causality (GC) in the Vector Auto-Regression (VAR) framework. He found that economic progress of India had a one to one affirmative influence on credit market expansion, and economic growth proceeds credit market expansion. The BSD in Pakistan is aimed to attain:

- Integration of financial institutions in the country.
- Make financial capital markets deep and broad.
- Introduced technological transformation by providing quality services to the customer.

- Reduce the opportunities of the corruption by increasing the number of commercial banks and reduce the Government banks.

DEVELOPMENT.

The objective of current article is to discover the relation of BSD with that of economic progress for Pakistan. Therefore, this study aims to extend the existing literature by analyzing the long run association between BSD and economic progress of Pakistan using fresh data. This study will test the hypothesis that banking sector contribution has a direct and significant effect on the economic progress of Pakistan.

The kind of evidences reported by other researchers showed that financial sector has significant part in the growth and development of a country (See e.g. McKinnon, 1973; Shaw, 1973 and Goldsmith, 1996). Any country which has an established financial sector has tendency for higher growth and development. In every country, financial sector is monitored by the monetary authority of that country. The State Bank of Pakistan (SBP) monitors the monetary sector. In Pakistan, the main sources of financing services in the country are commercial banks.

The commercial banks play the following two major functions; firstly, to accept the deposits from the individuals, businessmen and households and secondly, provide lending facilities to the customers, businessman and households. Commercial banks are the major sources of credit provision to the individual, households and producers. Banks also provide liquidity through the demand deposits and buying and selling of securities. The banking system promotes capital formation by providing loans for Investment in new enterprises, promotions of trade and industry, development of agricultural sectors, balanced growth and developments of different regions, influencing economic activities, implementation of monetary policy and promotions of exports (See e.g. Akpansung and Babalola, 2009).

Many other important and significant functions also played by the banking sector including motivating the people to save the money, channelized the household savings into fecund capital, enable the fruitful use of surplus to produce the employment and well-being of peoples, make available risk-free earnings to savers and facilitate the remittances.

This study has been distributed into five parts: introduction, literature cited, data and methodology, estimations and results, finally conclusions and policy implications.

Literature review.

In this section, a detailed and rigorous review of the existing literature on link between BSD and economic progress in an emerging economy setting resembling Pakistan had been presented. Finance-growth nexus for 25 transition countries¹, 1993-2000 had been investigated by Koivu (2002). The variables for the study were interest rate margin and credits. Results showed that interest rate margin and economic growth were negatively and significantly associated with each other while the private sector share in bank credit showed negative effects on economic progress in transition economies like Pakistan.

Iqbal and Sattar (2005) investigated the effect of remittances on economic progress. They found that remittances, public investment and private investment contribute economic growth positively while external debt and term of trade positively associated with economic growth of the country.

Various studies on the banking sector development (BSD) and growth nexus as part of existing literature treated this nexus differently for different countries using different data sets (see e.g. Azeez and Micheal, 2012; Aurangzeb, 2012; Arumugam and Selvalakshmi, 2014; Abu-Bader and Quran, 2005; Khanal, 2007; Mhadhbi *et al.*, 2017).

¹ “Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czeach, Georgia, Russia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Slovak pop, Slovenia, Tajikistan, Turkmunistan, Ukraine, Uzbekistan, Albania, Estonia and Macedonia”.

These researches had shown a positive and important impact of BSD for economic progress whereas reported negative relation between interest rate and growth.

Fausten *et al.*, (2006) considered contribution of financial development and economic progress in china using yearly data from 1952-1999. They found that in China financial development adds to economic progress predominantly via capital accumulation, while the linkage between financial development and productivity improvement is statistically weak.

Balogan (2007) studied the perspective of reforms in Nigerian banking sector for four eras: the restructurings Lethargy (1993-1998), Pre-soludo (1999-2004), post-Soludo (2005-2006), pre and post SAP (structural adjustment program) (1970-1993). He found that periods of quests of market restructurings were branded by improved inducements.

The link amongst economic progress and banking sector credit in Nigeria for 1970-2008 had been examined by Anieka and Babalola (2009). They analyzed the “impact of annual domestic bank credit to private sector, lending rate of commercial banks” and Industrial Production Index (IPI) on gross domestic product. They established that private sector has positive impact on economic progress while lending rate hampers growth.

The responses to the Bank Lending survey (BLS) reflect the disturbance to financial markets that led the Euro area during 2008 and 2009 had been investigated using data collected from survey consist of 17 standard questions divided into two parts: the first part examined loans or credit to enterprises and the second part examined loans or credit to household. He found that since its introduction in 2003, the BLS has helped to provide a more complete understanding of development in credit market and, by extension, macro-economic activity gives more information of the survey responses (Kennedy, 2011).

In an investigation, the major financial restructurings undertaken by the Pakistani Governments and explored their influence on economic progress for 1973- 2008. Their variables were economic growth, deposits, lending rate, real interest rate, saving rate and inflation. They found positive link between economic growth and deposits, lending and saving rate while negative with inflation and interest rate. They also found that financial reforms have a significant impact on the banking sector and economic growth (Rehman *et al.*, 2011).

The effect of banking market structure and regulation on economic progress using data on banking market manufacturing industry-level growth rates for U.S states for 1899- 1929 was investigated by Michener and Wheelock (2012). They found that banking market concentration generally exerted a positive influence on the growth of U.S manufacturing industries in this period. The impact of banking market concentration on growth was weaker for industries with larger firms.

Osonda *et al.*, (2014) examined the institutional reforms on financial sector development for Nigeria for 1996-2011. They found significant and positive influence of domestic credit to private sector as percentage of GDP, Political stability and absence of Violence, Regulatory quality and Government effectiveness with financial sector development. Institutional quality strongly impacted on financial sector expansion.

Quixina and Almeida (2014) analyzed the relation among financial development and economic progress for Angola during 1995-2012. Their variables were ratio of M2 to GDP, Oil revenue and non-oil revenues and non-oil GDP per capita. The result showed that in the Granger sense, the expansion of the banking system does not cause growth in Angola, equally for oil and non-oil sectors. However, economic progress affected the development of banking system.

Emorial *et al.*, (2014) investigated that bank consolidation in the Nigerian financial system secured through mergers and acquisition by increasing shareholders' funds for investor's confidence as well as financial stability and operational efficiency of the consolidation banks. The variables were banks

capital, aggregate investment, loans and advances, bank profitability. They reported that bank capital was a determinant of banks performance and bank investment has a positive impact on the economy. The study also found that loans and advances were the determinant of bank profitability.

In this study dependent variable is GDP and explanatory variables include contribution of banking sector to economic growth for which we used advances, remittances and money market rate (MMR) as a proxy variable. The 'advances' and remittances played very crucial part in the development of financial sector. The previous studies showed that the credit market development spur the economic growth see. e.g. (Mishra *et al.*, (2009).

The improved foreign remittances increase the economic growth. The effect of remittances on economic growth may be positive because foreign remittances are precondition to speed up real output growth in the economy (Iqbal and Sattar, 2005).

Bank advances or loans play very important part in growth of financial sector and economic progress of any country. Banks provide loans to individuals, household, businessman, companies and they used this loan for the productive purpose, and then, employment will also increase in the country. So, the advances significantly affect the economic growth see e.g. (Aurangzeb, 2012).

There are many variables which influence the growth. According to above literature survey, there is another variable Remittances that is playing important role in the banking sector development and also contributing to economic progress, especially in Pakistan during last a few years, Remittances share increased in the country rose sharply from UAE, Saudi Arabia, Malaysia and other countries of the world. Some researchers analyzed the share of remittances in economic progress generally (Iqbal and Sattar (2005). This study will consider remittances as an important factor of banking sector and then analyzed its effect on GDP.

Although existing literature reviewed provide a valuable view on banking sector development and growth nexus, but existing literature suffers from some shortcomings including ignoring remittances as key variable that can affect the growth of an economy through its role in banking sector development. This study has used economic progress for economic growth and economic expansion for economic development interchangeably throughout the study. The paper uses latest available time series data for analysis and has used appropriate remedial measures to control for problem of serial correlation.

Data and methodology.

This article studies the link of BSD with economic progress through testing hypothesis that BSD has significant influence on economic progress on annual time series data from 1980-2018. The model is a variant of existing empirical work with some augmentations based on literature review estimated using the technique of cointegration involving Augmented Dickey-Fuller (ADF) unit root test, Selection of an appropriate lag length, Serial correlation LM-test, Johansen Co-integration test and Error Correction Mechanism, Granger Causality testing and finally CUSUM test application.

In this research work Gross Domestic Product (GDP) is used as a dependent variable and Advances, Remittances and Money Market Rate (MMR) as independent variables. We obtained the data of GDP from World development Indicator (WDI), data of Advances, and Remittances from Pakistan Economic Survey while data of money market rate from “International Monetary Fund (IMF)”. The Money Market Rate (MMR) has been used as proxy for interest rate due to non-availability of interest rate data. See. e.g. (Allang and Oulich, 2009).

The model is based on the modification to empirical model of Aurangzeb (2012), Iqbal and Sattar (2005), Arumugam and Selvalakshmi (2014) and Rehman *et al.*, (2011). Therefore, functional relationship becomes:

$$GDP_t = \alpha + \beta_i X_t + \varepsilon_t \quad (1)$$

$$GDP_t = \alpha + \beta_1 ADV_t + \beta_2 REM_t + \beta_3 MMR_t + \varepsilon_t \quad (2)$$

Where X_{it} in (1) is the vector of variables of interest for Pakistan explained as follows; ADV, REM, MMR as Advances, Remittances and Money market Rate respectively. Taking natural logarithm of (2), we get,

$$gdp_t = \alpha + \beta_1 adv_t + \beta_2 rem_t + \beta_3 mmr_t + \varepsilon_t \quad (3)$$

Table 1 below describes the variables of the study.

Table1: Variable's Description	
Variables	Definitions
Gross Domestic Product (GDP)	It is equal to the current value of all the goods and services produced within the country during a specified time period.
Advances	“Advances are the addition of money from a bank to another party with the agreement that the money will be repaid”.
Remittances	Foreign remittances are defined as the “transfer of money from a migrant worker to their families or other individuals to their home countries”.
Money Market Rate (MMR)	“An interest-bearing account that typically pays a higher interest rate than a savings account, and which provides the account holder with limited check-writing ability”.

Source: Author's derived information from various sources.

One of the key issues in time series econometrics is the stationarity of the variables. If a time series is stationary, its means, variance and auto covariance (at various lags) remain the same no matter at what point we measure them; that is, time series will tend to return to its mean (called mean reversion) and fluctuation around this mean (measured by variance) will have a broadly constant amplitude. When our model is non-stationary and we estimate it by OLS then our results will be spurious. So,

data is tested by applying Augmented Dickey Fuller (ADF) unit root test to investigate Stationarity of each time series proposed by Dickey and Fuller in (1981) as:

$$\Delta X_t = \alpha_0 + \phi X_{t-1} + \sum_{i=1}^n \delta_i \Delta X_{t-i} + \varepsilon_t \quad (4)$$

Where ΔX_t is the first difference of series of interest. α_0 is intercept, ϕ “Coefficient of lagged term, t is the time or trend and n is the number of lagged terms”. The H_0 of ADF test is;

$H_0: \phi = 0$, i.e. Unit root.

$H_1: \phi < 0$, i.e. No unit root.

If computed ADF test statistic is higher than McKinnon’s Critical values, then H_0 is accepted and the time series is non-stationary or I (1). All variables were found integrated of order 1. So, study used the approach of Johansen cointegration which enables to affirm there existence of a long term association between the variables.

Lag length Selection Criteria shows the order of VAR between the variables. Estimating the lag length of autoregressive process is a vital exercise in most econometric studies. Akaike’s information criterion (AIC), LR test and FPE will be used for autoregressive lag length Selection in this study. Serial Correlation LM-test has been used for presence of the Serial Correlation with following null and alternative hypothesis;

H_0 : There is no Serial correlation at the given lag.

H_1 : There is Serial correlation at the given lag

The VAR models are used to generalize the univariate Auto regression (AR) models by allowing for more than one evolving variable and linear inter dependencies among several time series.

For Cointegration analysis Johansen (1988) and Johansen and Juselius (1990) maximum likelihood procedure that utilizes two test statistics to decide number of cointegrating vectors was used. The trace-test statistic can be specified as:

$$\lambda_{(trace)} = -T \sum_{i=r+1}^n \log (1 - \lambda_i) \quad (5)$$

Where λ_i the largest Eigen value of matrix Π , T is the number of observations.

$\lambda_{(trace)}$ Statistics tests H_0 of a specified number of cointegrating vectors against H_1 of more than specified number of “cointegrating vectors. In this statistic $\lambda_{(trace)}$ will be lesser when the value of the characteristic roots is closer to zero”.

The Maximum Eigen-value test statistic can be specified as:

$$\lambda_{(max)} = -T \log (1 - \lambda_{r+1}) \quad (6)$$

Where λ_{r+1} Is the (r+1) largest squared Eigen value. $\lambda_{(max)}$ Statistics tests the null hypothesis of ‘r’ cointegrating vectors against alternative hypothesis of ‘r+1’. If the estimated value of the characteristic root is close to zero, then the $\lambda_{(max)}$ will be small. Finding a long run equilibrium relation allows one to see if the variable’s dynamics are consistent with long run.

There are two expectations from Error Correction Model; firstly, Sign of coefficient of error correction term will be negative and secondly, it should be significant.

Estimation and results.

Prior to the testing for cointegration, the order of integration of each variable has been checked using Augmented Dickey-Fuller (ADF) test.

Variables	Level		First Difference	
	C	C + T	C	C+T
GDP	-2.40	-3.13	-4.45*	-4.76***
ADV	-2.40	2.77	-5.16***	-5.51***
REM	-1.80	-4.13	-4.06***	-6.68***
MMR	-1.98	-2.12	-5.46**	-5.40***

Note; *, **,***represent significance at 10, 5 and 1% respectively

Reported results in table 2 propose that all variables turn into stationary variables after first differencing, appropriate for use of the Johansen Cointegration technique for analyses.

The Akaike information Criteria (AIC), LR and FPE were used to find the lag length. According to these three criteria's the optimal lag length is 2. The result of lag length criteria are shown in the table 3 below.

Lag-order	AIC	LR	FPE
1	10.7271	-	0.0313
2	1.8553*	271.2907*	4.5006*
3	1.9667	30.4744	5.6906

Note: *Indicates lag order selected by the criterion.

Highlighted row in table 3 indicates the selection of lag length of 2 by all the three criteria considered. In order to confirm, whether or not, there is serial correlation in the model at lag length of 2, Serial correlation LM test has been used with results shown in the table 4 below.

Lags	LM-stat	Probability
1	25.05	0.0571
2	27.27**	0.3421
3	20.94	0.6956
4	30.58	0.2030

Note: ** Shows significance at 5% level.

The results of table 4 show that the probability value is more than the 5 percent which shows that null hypothesis is accepted at 5% implies no serial correlation in the model at selected lag length 2.

For deciding number of long-run equilibrium relations between variables, results showed that together the “maximum Eigen value and the Trace statistic” propose existence of three equilibrium relations between the variables at 5 percent level. This uncovers presence of a long-run equilibrium connection amongst GDP and variables considered as proxy for banking sector contribution.

Assumed No. of Cointegrating Equations(s)	Eigen-value	Trace- Statistic	0.05Critical Value	Prob.**
None *	0.7151	81.60	69.81	0.0043
1	0.4676	41.41	47.85	0.0059
2	0.3716	21.23	29.70	0.0032
3	0.0014	0.04	3.84	0.8313

Note: ** denotes the rejection of hypothesis at the 0.05 level. Trace test indicates 3 cointegrating eqn(s) at the 0.05 level.

Table 5 indicates presence of three cointegration equations at five percent level. The Johansen tests estimated in table 5 shows that both the Trace test and Max-Eigen value tests indicate three cointegrating equation which shows long-run relations between variables. Therefore, allow estimating the Error Correction Model (ECM) for analyzing the short run dynamics of the variables.

The estimated cointegrated model proposes that any set of cointegrated time series has an error-correction illustration, which reflects the short run adjustment mechanism. The objective of this study was to determine if short-run dynamics are affected by expected long-run equilibrium conditions.

Variables	Coefficient	Standard Error	T-statistic	Probability
d(gdp)	0.1958	0.2705	0.7240	0.9337
d(adv)	-0.2844**	-1.0391	-1.0391	0.0595
d(rem)	0.2999*	0.1750	1.7131	0.0630
d(mmr)	-0.1003	0.2878	-0.3485	0.9417
Ecm(-1)	-0.1380**	0.0625	-2.2061	0.0519
R-Square	0.5337	---	F-Statistic	1.93

Note: *, ** shows the Significance at 1 and 5 percent respectively

The table 6 show that coefficient of ECM is -0.1380, which is negative and significant at 5 percent. This implies GDP for Pakistan has an automatic adjustment mechanism and that the economy responds to deviations from equilibrium in a balancing manner. The value of -0.1380 for ECM term proposes that Pakistan economy will converge to long-run equilibrium at the rate of 13.80 percent annually.

Table 7 of the study indicates that all the variables advances, and remittances are positively and significant at 5 percent. While the coefficient on money market rate confirms negative and significant relation with GDP for Pakistan.

Variables	Coefficient	t-Statistic
Constant	0.803	7.915***
Adv	0.436	2.907***
Rem	1.167	3.950***
Mmr	-0.031	0.342***
R-squared	0.807	
Durbin Watson	1.906	
F Statistic. (Probability)	69.742 (0.000)	

Note: *, **, *** Denotes significance at 1%, 5% and 10% respectively.

Table 7 completes the picture of the study where GDP is a dependent variable and Adv, rem and mmr are explanatory variables. The coefficients on Adv and rem are positive and significant while that of mmr is negative and significant. Our results are robust to other studies (Iqbal and satar, 2005, Aurangzaib, 2012; Evans, 2013).

CONCLUSIONS.

The objective of the study was to explore the long run link among the BSD and economic progress. For empirical testing of the BSD and economic progress nexus Johansen Cointegration mechanism has been used. The overall model shows positive relationship between economic growth and banking sector development. More specifically the Advances, Remittances shows positive and significant relations with the economic growth implying that when advances, and Remittances increased than economic growth will also increase. The money market rate (MMR) show negative relations with economic growth which means when MMR will increase than economic growth will decrease as expected.

Accepting the hypothesis implies that to achieve the sustainable long run growth policies should be designed to promote the existing Banking sector coupled with the development of new banking institutions. There is further need of more investment in the Banking sector of Pakistan to boost growth at sectorial as well as at aggregate level by promoting the factors that lead to banking sector development excluding money market rate. Future research can focus on adding more variables, testing Granger causality and taking into account structural breaks.

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