



IMPACT OF MONEY SUPPLY AND FINANCIAL INNOVATION ON ECONOMIC GROWTH OF PAKISTAN: A NEW PERSPECTIVE

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ABSTRACT

In any economy, GDP Growth is massively motivated by rapid innovation in the financial system. Financial system plays an important role to promote economic growth in any country. It also improves the financial operation in Foreign Trade with other countries. So, the aim of the present study is to investigate the impact of Financial Innovation on Economic Growth in case of Pakistan. For this purpose, the study used different macroeconomic variables including, GDP as dependent variable, and domestic credit to private sector is used as proxy of financial innovation. Other control variables include, Ratio of M1 to M2, Gross Capital Formation (GCF), Government Spending (GE), Trade (TR), Labour Force (LF) and Inflation (INF). Annual Time Series Data is collected of selected variables from 1980 to 2020. The study analyses data by applying Ordinary Least Square (OLS) method. The empirical results of OLS indicate that, Financial Innovation (FI), boost up economic growth, this shows the positive impact on GDP, while other variables including, M1M2, GCF, GE, TR and LF put positively significant impact on GDP, while only INF has negative and insignificant impact on GDP.

Keywords: Financial Innovation; Ratio of M1 to M2; Gross Capital Formation; Government Spending; OLS

JEL Codes: G23, E51

I. INTRODUCTION

In any country, the payment methods play essential position in the flat performance of the finance sectors. A well-organized payment system is one that give immediate resolution of financial transactions and speed up the exchange of goods and services on time, sheltered, and dependable way. The procedure of generating latest financial investment, products, innovation of institutions and services is called financial innovation. These changes can contain efficient technology, risk management, risk transfer, credit and equity generation, and many other innovations. In simple terms, addition of new financial instruments in financial system by using new technologies.

Process innovation is latest way of operating business and put into practice information technology, like the Automated – Teller – Machine (ATM), Mobile Banking and Online Banking. Product innovation comprise latest financial products like Security Assets, Derivatives, Weather Derivatives, Mortgages of Foreign Currency, Hedge Funds, Exchange – Traded Funds, Private Equity and Retail Structured Products. Institutional innovation is the procedure of initiating latest kind of financial firms like Discount Broking Firms, Internet Banking, Specialist Credit Card Firms. All these kinds of modernism progress the system of payment used in the sponge and funds lending, which eventually unlock up a speedy mode of contracting with consumers. Further, they comprise innovations in technology, equity generation, and risk transfer, which enhance the accessible funds for borrowers and endow with financial institutions with latest and low – cost mode to increase capital. In the last few decades, these financial innovations have extended global acceptance and provided as new financial instruments, processes, services, institutions, and market segments etc. The effect of every innovation may be dissimilar depending on its position in the financial system.

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GDP is usually deliberate using changes in the total value of goods and services produced by a country are known as GDP (Gross Domestic Product). The GDP per Capita is measured by the dividing the GDP by its total size of their population. Different countries have different level of GDP per capita, these differences in levels and in trends are motivated by augmented productivity that comes from innovation and technological progress. The innovation in financial sectors plays fundamental role in GDP growth through sustaining the financial occurrence, easing the financial operations in international trade and humanizing the financial ability. Financial innovation is also enhancing GDP of any country by promoting financial inclusion, mobile money transfers and enabling remittances, which in turn has an impact on economic growth.

According to empirical reviews present in this study, a fine – functioning system of finance may have optimistic effect on GDP growth through investment. Financial mediators make easy the stipulation of sufficient funds for investment behavior. As the financial system enlarges more capital can be channeled through it and additional funds will be obtainable for investment. A strong financial system may guide to a better aptitude to evaluate investment projects.

Pakistan economy is developing economy, like many other developing countries, Pakistan is also facing the problems in financial sectors. In case of Pakistan, financial sector is very different from others in the world. Few studies have been conducted to understand the impact of innovation in financial on GDP growth. A very limited number of studies were conducted on the topic of Innovation and Economic Growth. There is a very limited number of studies are available on the topic of economic growth and innovation specifically in Pakistan. The present study measures the impact of various financial innovative products on the efficiency ratio of deposit money banks in Pakistan.

II. LITERATURE REVIEW

Rashid and Ahmad (2021) expressed the relationship among the financial sector development, innovation sample and economic growth of 12 countries by using panel data from 1995 to 2016 through random effects estimator. The empirical results show significant evidence in the existence of innovation, economic growth decreases with financial development. Researcher used other variables namely inflation rate, domestic saving to GDP ratio is significant in stimulating economic growth in selected countries. Empirically results shows innovation and financial development are positively related to growth of economy. Policy maker suggested that central bank should maintained inflation at reasonable level to balanced economic growth.

Rahman et. al in (2021) investigates the role of investing in Information and Communication Technologies (ICT) and spreading the growth of the Pakistani economy by raising the level of ICT investment limit. At their proposed level, the introduction of ICT significantly improves the supply of capital goods, ultimately boosting economic growth. In this art research, they make use of the latest available information on new technologies and investments, from 2003 to 2018. Including structural breaks, the results of the regression analysis show that Pakistan's economic growth is not affected by ICT development. However, they see a small amount of evidence invested in ICT investment. Following the existing documentation, they use the export of ICT assets and their importation as an investment in ICT investment. Interestingly, economic growth in Pakistan is also not affected by the export of ICT goods.

Jan et al., (2021) efforts to identify the source of renewable EG energy in Pakistan by examining the short-term and long-term relationship between EC and EG in 1972-2015. The root analysis of the breakpoint unit was used to investigate the flexible stationarity properties and structural break. The integrated test method of Autoregressive distributed lag (ARDL) has been used to determine the presence of long-term relationships between variables. The results of the ARDL model confirm the existence of coherence between variables. The findings confirm that a renewable and non-renewable EC develops an EG in Pakistan. However, the magnitude of the coefficients and the high value level ensure that renewable energy (RE) emits EG much better than non-renewable energy. The study concludes that the government needs to increase investment in developing and evaluating RE resources to ensure sustainable EG in Pakistan.

Solomon and Van Klyton (2020) analyzed the impact of the use of digital technology on economic growth in 39 African countries from 2012 to 2016. This analysis applies to the GMM system analyst to understand how the use of digital technology contributes to growth using a certain degree of digitalization from the Networked Readiness Index. Unlike previous research, we distinguish between the impact of individual consumption, business, and government on growth and show that individual consumption alone has a positive impact. Also, a separate analysis of the types of uses reveals that the two indicators, the media and the importance of ICT from a government perspective, are critical to growth.

Li et al. (2021) investigates the asymmetrical effect of economic decentralization on economic growth and environmental quality through Pakistani data from 1984 to 2018. Our findings show that cost-sharing has a similar effect on economic growth and CO2 emissions in the short and long term in Pakistan. Therefore, the positive and negative decline in the use of energy allocation affects economic growth and emissions of CO2 separately in Pakistan. The results of the asymmetric ARDL suggested that the negative shocks on revenue sharing reduced economic growth and CO2 emissions in the short and long term, while positive interdisciplinary shocks reduced economic growth and CO2 emissions. Our asymmetric results are country-specific and effective in policy analysis in Pakistan. The results of this study can also help Pakistani and local governments in dealing with growth and pollution.

III. MODEL SPECIFICATION

The econometric and mathematical equation of current framework can be written as:

Mathematical Equation

$$GDP = f(FI, GCF, GE, LF, M1M2, TR, INF)$$

Econometric Equation

$$LGDP = \beta_0 + \beta_1 FI + \beta_2 GCF + \beta_3 GE + \beta_4 LF + \beta_5 M1M2 + \beta_6 TR + \beta_7 INF + \epsilon$$

Where;

LGDP =	Log of Economic Growth
FI =	Financial Innovation
GCF =	Gross Capital Formation
GE =	Government Expenditure
LF =	Labor Force
M1M2 =	Ratio of M1 to M2
TR =	Foreign Trade
INF =	Inflation
β_0 =	Intercept
$\beta_1 \beta_2 \beta_3 \beta_4 \beta_5 \beta_6 \beta_7$ =	Slope of Coefficient
ϵ =	Error Term

IV. RESULTS AND DISCUSSION

Descriptive statistics is a technique used to summarize the major characteristic of collected data. Results of Descriptive statistics of dependent variable and Independent variables are given in the Table.

Table-1

	LGDP	FI	M1M2	GCF	GE	LF	TR	INF
Mean:	4.453538	22.75614	4.141049	17.36330	105.9053	45.75152	30.43404	8.163158
Median:	4.375561	24.03953	4.073842	17.72224	106.2778	42.76000	32.93991	7.844265
Maximum:	5.751199	29.78608	5.667364	20.70200	112.0384	73.91000	38.49932	20.28612
Minimum:	3.163551	15.38607	2.788490	14.12063	99.06016	25.65000	25.30623	2.529328
Std. Dev:	0.82572	4.000333	0.854671	1.653266	3.561843	15.73181	3.579379	3.763079
Skewness:	0.150569	-0.373067	0.371467	-0.324288	-0.160586	0.395806	-0.459371	0.675493
Kurtosis:	1.620856	2.030239	1.912588	2.075316	2.102417	1.749726	2.395380	3.770034
Jarque-Bera:	3.404232	2.557632	2.962957	2.179306	1.552545	3.740966	2.066488	4.130948
Probability:	0.182297	0.278367	0.227301	0.336333	0.460118	0.154049	0.355851	0.126758
Sum:	182.5951	933.0016	169.7830	720.0953	4342.117	1875.812	1329.796	334.6895
Sum Sq. Dev:	27.27255	640.1066	29.21852	109.3315	507.4690	9899.589	512.4782	566.4304
Observations:	40	40	40	40	40	40	40	40

Above table shows the summary of Descriptive Statistics of selected variables. The first row shows the average of LGDP, FI, M1M2, GCF, GE, LF, TR and INF are (4.453538), (22.75614), (4.141049), (17.36330), (105.9053), (45.75152), (30.43404) and (8.163158) in the order. The Median value of LGDP, FI, M1M2, GCF, GE, LF, TR and INF are (4.375561), (24.03953), (4.073842), (17.72224), (106.2778), (42.76000), (32.93991) and (7.844265) are in the order. Skewness corresponds to an inequity and irregularity from the mean of a data distribution in statistics. If we declare that data distribution is skewed, the mean is straight in the middle & top point of the bell curve and the mean,

median and mode are same. In a normal distribution of data and entirely balanced bell curve, the median and mean are forever the similar value.

Here we see that; FI, GCF, GE and TR are negatively skewed, because their values of mean are less than their values of median. While, other variables like LGDP, M1M2, LF, and INF are skewed positively, because their values of mean are greater than their values of median. Now; the next row presents the values of kurtosis. Kurtosis is used to calculate the smoothness of data set relative to normal distribution. Kurtosis value of normal distribution is equal to 3. If the kurtosis value is greater than 3, it means probability distribution is highly peaked and known as Leptokurtic. If the value of kurtosis is less than 3, it means probability distribution showing flatness of data and it is known as Platykurtic. Here in the table above, only the value of Kurtosis of Inflation is greater than 3, so these variables are Leptokurtic. And the values of Kurtosis of LGDP, FI, M1M2, GCF, GE, LF and TR are less than 3, so these variables are Platykurtic.

Correlation is a method which is used to calculate the association among DV and IVs. Pair – Wise Correlation coefficient is compulsory because the multicollinearity problems between variables are recognized. High correlation among variables demonstrates the multicollinearity trouble.

Table 2: Results of Pair – Wise Correlations Matrix

Variables	LGDP	FI	M1M2	GCF	GE	LF	TR	INF
LGDP:	1							
FI:	0.682827	1						
M1M2:	0.736515	-0.452766	1					
GCF:	-0.685016	0.744330	-0.623283	1				
GE:	0.033727	0.011110	0.099766	0.083890	1			
LF:	0.959781	-0.714372	0.807796	-0.726411	0.033727	1		
TR:	-0.519420	0.549833	-0.277043	0.609372	0.122271	-0.583284	1	
INF:	0.019681	0.189897	0.098262	0.208193	0.187609	-0.046381	0.578828	1

The table below indicates the results of Pair – Wise Correlation Matrix. It illustrates that only value of LF is highly correlated with LGDP about (0.959781), and shows the co-linearity with LGDP. Overall results demonstrate that, Multi – Colinearity does not exist in the data set.

The problem of Autocorrelation is tackled by Serial Correlation LM test. According to this test, significant value shows the existence of autocorrelation and insignificant value shows does not existence of autocorrelation. The results of Serial Correlation LM test are given in the below:

Table 3: Results of Serial Correlation LM Test: Breusch – Godfrey Serial Correlation Test:

F-Statistic:	6.542741	Prob. F (229):	0.2145
Obs* R ² :	12.43705	Prob. Chi – Square:	0.0020

Source: Author’s own Calculation by Using E-views-9

The results indicate that, the probability values of LM test is insignificant (0.2145), this shows that the problem of Autocorrelation does not exist in the data set.

The problem of Heteroskedasticity is tackled by Breusch – Pagan – Godfrey Test. According to this test, significant value shows the existence of Heteroskedasticity and insignificant value shows does not existence of Heteroskedasticity. The results of Breusch – Pagan – Godfrey Test are given in the below:

Table 4: Results of Breusch – Pagan – Godfrey Test: Breusch – Pagan – Godfrey Test:

F-Statistic:	1.259358	Prob. F (229):	0.2998
Obs* R ² :	9.811218	Prob. Chi – Square:	0.2785

Source: Author’s own Calculation by Using E – Views – 9

The results indicate that, the probability values of Heteroskedasticity test is insignificant (0.2998), this shows that the problem of Heteroskedasticity does not exist in the data set.

Table 5: Results of Ordinary Least Square (OLS) Dependent Variable: LGDP

Method: Least Square				
Observations after adjustment 40 (1980 – 2020)				
Variables:	Coefficient	Std. Error	t-Statistic	Prob.
FI:	0.006194	0.001894	-3.270382	0.0026
M1M2:	0.090021	0.013411	3.712329	0.0000
GCF:	0.034281	0.007725	2.437506	0.0001
GE:	0.013624	0.002395	-4.687813	0.0000
LF:	0.035562	0.007310	3.864630	0.0000
TR:	0.002271	0.005355	0.424122	0.0335
INF:	-0.009936	0.002657	3.739044	0.1375
LGDP (-1):	-0.267357	0.134201	1.992216	0.0552
C:	2.183653	0.345779	6.315171	0.0000
	R ² :	0.996049	Adjusted R ² :	0.995030
Durbin Watson Stat:		2.070321		

In table, the value of coefficient of Financial Innovation (FI) explains the positively significant (0.0026) impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in Financial Innovation (FI) it will lead (0.006194) percentage increase in GDP. The value of coefficient of M1M2 shows the positively significant (0.0000) impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in M1M2 it will lead (0.090021) percentage increase in GDP.

The value of coefficient of GCF also shows the significantly (0.0001) positive impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in GCF it will lead (0.034281) percentage increase in GDP. The value of coefficient of GE also shows the significantly (0.0000) positive impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in GE it will lead (0.013624) percentage increase in GDP. The value of coefficient of LF also shows the significantly (0.0000) positive impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in LF it will lead (0.035562) percentage increase in GDP.

The value of coefficient of TR also shows the significantly positive (0.0335) impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in TR it will lead (0.002271) percentage increase in GDP. The value of coefficient of INF also shows the negatively insignificant (0.1375) impact on Gross Domestic Product (GDP). Empirical result shows that, 1 unit increase in INF it will lead (-0.009936) percentage decrease in GDP.

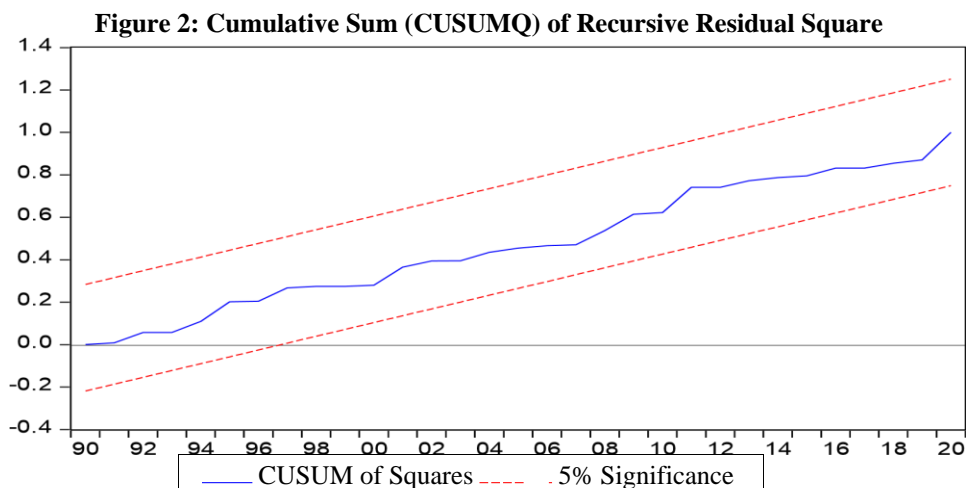
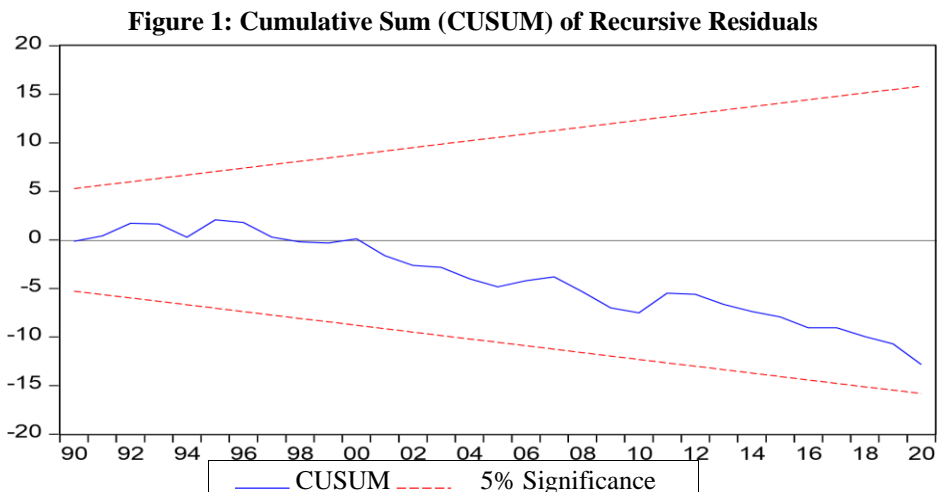
To scrutinize the Stability of the estimated coefficients, we have plotted the Cumulative Sum (CUSUM) of Recursive Residuals & Cumulative Sum (CUSUMQ) of Recursive Residual Square.

The consequence indicates that it is Stable because CUSUM is within 5% level of significance and CUSUMSQ is also within limits of 5% significance level.

V. CONCLUSION

The core purpose of current study is to scrutinize the effect of Financial Innovation (FI) on Economic Growth (GDP) in Pakistan. For this motive, the study used annual data over the period of 1980 to 2020. Data is collected from different data sources including World Bank (WDI) and State Bank of Pakistan (SBP). Further; the study analysed data with different techniques. Firstly, the study explains the result of descriptive statistics. Secondly, study illustrated the results of Pair – Wise Correlation Matrix, which indicates that there is no multicollinearity. The study explains the results of Autocorrelation and Heteroskedasticity, which point out that both problems does not exist. After that, the study applied OLS, to finds the association among IVs and DV. Empirical results of OLS illustrated that, Financial Innovation put positive and significantly impact on GDP in case of Pakistan. The growth theory clarifies that an energetic financial system facilitates the procedure of funds accretion that eventually impacts the improvement of the economy. The next variable Ratio of M1 to M2 also shows positively significant impact on GDP. The availability of money supply increases the credit opportunity with a lower interest rate. Gross Capital Formation (GCF) is showing Positively and significant impact, Government Spending (GE) is indicated positively significant impact on GDP too. Labor Force

(LF) and Foreign Trade (TR) also shows positively significant impact on GDP. While, Inflation (INF) put negatively insignificant impact on Dependent variable (GDP) in Islamic Republic of Pakistan. On the basis of findings, it is important to recommend some policy implications that are policy-makers would motivate an affirmative relationship of financial innovation and GDP growth. The administrative authorities should improve a competitive financial environment with new cooperation by including recognized and informal institutions in this system.



REFERENCE

- Jan, I., Durrani, S. F., & Khan, H. (2021). Does renewable energy efficiently spur economic growth? Evidence from Pakistan. *Environment, Development and*
- Li, X., Younas, M. Z., Andlib, Z., Ullah, S., Sohail, S., & Hafeez, M. (2021). Examining the asymmetric effects of Pakistan's fiscal decentralization on economic growth and environmental quality. *Environ Sci Pollut Res Int*, 28(5), 5666-5681.
- Rahman, H. U., Ali, G., Zaman, U., & Pugnetti, C. (2021). Role of ICT Investment and Diffusion in the Economic Growth: A Threshold Approach for the Empirical Evidence from Pakistan. *International Journal of Financial Studies*, 9(1).
- Rashid, A., & Ahmad, F. (2021). Financial Development, Innovation, and Economic Growth: The Case of Selected Asian Countries. *Kashmir Economic Review*, 27(1).
- Solomon, E. M., & van Klyton, A. (2020). The impact of digital technology usage on economic growth in Africa. *Utilities policy*, 67, 101104-101104.