IMPACTS OF DOMESTIC SAVINGS AND DOMESTIC INVESTMENT ON ECONOMIC GROWTH: AN EMPIRICAL STUDY FOR PAKISTAN

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ABSTRACT

The purpose of this paper is to ascertain the dynamic impacts of domestic savings and domestic investment on economic growth of Pakistan by using annual data spanning from 1973 to 2018. After being confirmed that all the variables are stationary at first difference and have long-run cointegrating association, this study employed Dynamic Ordinary Least Squares (DOLS) approach to estimate long-run elasticities. The empirical findings reveal that domestic savings are negatively and domestic investment is positively associated with economic growth in Pakistan. In a nutshell, the results convey that domestic savings are dampening the economic growth figures and domestic investment is contributing to economic growth figures of Pakistan. The results of causality analyses report bidirectional causal link between domestic savings and economic growth and a unidirectional causal association between economic growth and domestic investment. Based on these empirical findings some policies are recommended to accelerate economic growth and for the long term sustainability of economic growth in Pakistan.

Contribution/Originality: This study is one of very few studies which have investigated how the economic growth of Pakistan has been influenced by domestic savings and domestic investment between the period 1973-2018. The study found that domestic savings negatively and domestic investment positively affected economic growth of Pakistan during that period.

1. INTRODUCTION

Economic growth and performance of any country is regulated by multiple determinants. Savings and investment are two of the important macro variables which play a noteworthy role in boosting economic growth, inflation stability and generation of employment opportunities especially in the context of a developing country (Nasir, Khalid, & Mahmood, 2004). Saving and investment has a dynamic positive effects on economic growth (Danisman, 2012). Domestic savings are critically important to maintain a higher level of investment which is a key factor for sustainable economic uplift. But investment cannot be enlarged without increasing the savings and because of this saving is considered as a prerequisite for raising investment, which further lead to economic growth.

Savings play a crucial role in the mobilization of internal resource and economic growth of developing countries (Lewis, 1954). But it is also important to mention that negative relationship between domestic savings and economic growth has been ascertained by some empirical studies (Joshi, Pradhan, & Bist, 2019). The saving-growth nexus plays a vital role in the neoclassical growth models of Solow (1956); Cass (1965); Ramsey (1928) and Koopmans (1965). According to all these growth models, higher saving rates should foster growth as higher

savings imply higher capital investment. Saving positively associated with growth in the countries which are not too close to the technological frontier. But saving does not positively affect growth at all in those countries which are close to the technological frontier. Savings may contribute to economic growth by the proper utilization of resources to enhance the productive capacity of the economy (Mason, 1988). Thus, real economic growth and development of any country requires adequate investment, which is a function of savings.

The multiplier impact of rise in investment positively influences economic growth (Keynes, 1936). When investment is poor, then economic growth would be slow. Thus, in each and every economic transaction investment is very crucial (Heijdra, 2017). Many scholars have identified a positive relationship between investment and economic growth across countries (Chatterjee, Sakoulis, & Turnovsky, 2003; Maki, Yotsuya, & Yagi, 2005). The effects of investment on economic growth are of two folds. Firstly, a rise in investment will stimulate the production of goods which in turn leads to high economic growth, and secondly, capital formation improves the productive capacity of the economy which further makes the economy capable to produce more output and results in a faster economic growth.

Though the contribution of saving and investment to economic growth has been invariably assumed to be positive theoretically, still the relationship among them is a matter of empirical investigation. This paper is an attempt to show the impacts of domestic savings and domestic investment on economic growth in Pakistan between 1973 and 2018 by addressing the questions; whether domestic saving is effective in heightening the economic growth in Pakistan or not and whether domestic investment is stimulating economic growth in Pakistan or not. This study has also tried to discuss some important determinants of saving and investment and to show saving and investment scenario of Pakistan. Basically, this paper made an attempt to answer the following two questions:

- What kind of association is present among domestic savings, domestic investment and economic growth in Pakistan?
- What is the direction of causality between domestic savings, domestic investment and economic growth in Pakistan?

Despite the availability of empirical studies on domestic savings, domestic investment and growth in the case of other countries, but the findings obtained from those studies cannot be generalized in the case of Pakistan due to various country-specific factors. As there are very few empirical works available on this topic using recent data in the context of Pakistan and as still there is debate on the issues of savings-growth nexus and investment-growth nexus, so this paper tries to contribute to this debate and existing literatures to assist policy-formulators of Pakistan in their policy making by providing consensus evidence on the association between domestic savings, domestic investment, and economic growth in Pakistan.

The rest of the paper is designed as follows. Section 2 covers the overview of domestic savings, domestic investment and economic growth scenarios in Pakistan. A review of the existing literatures is summarized in section 3. The econometric model and the data are explained in section 4. The econometric methodologies used in this paper are briefed in section 5. Section 6 reports and describes the results obtained from the empirical analyses. The conclusions with some recommendations based on the study's findings are drawn in the section 7.

2. AN OVERVIEW OF DOMESTIC SAVINGS, DOMESTIC INVESTMENT AND GDP GROWTH IN PAKISTAN

Pakistan is located in South Asia, which encompasses a total land area of 881,913 square kilometers with a population of more than 212.2 million. Being a lower middle-income country, it has managed some satisfactorily healthy economic growth performances in the first four decades of its emergence. Its GDP growth has been moderately risen since 2012, but recently in 2019 it has declined by 4.85% from 2018. The GDP growth figures of Pakistan from 1973 to 2018 are illustrated in Figure 1.
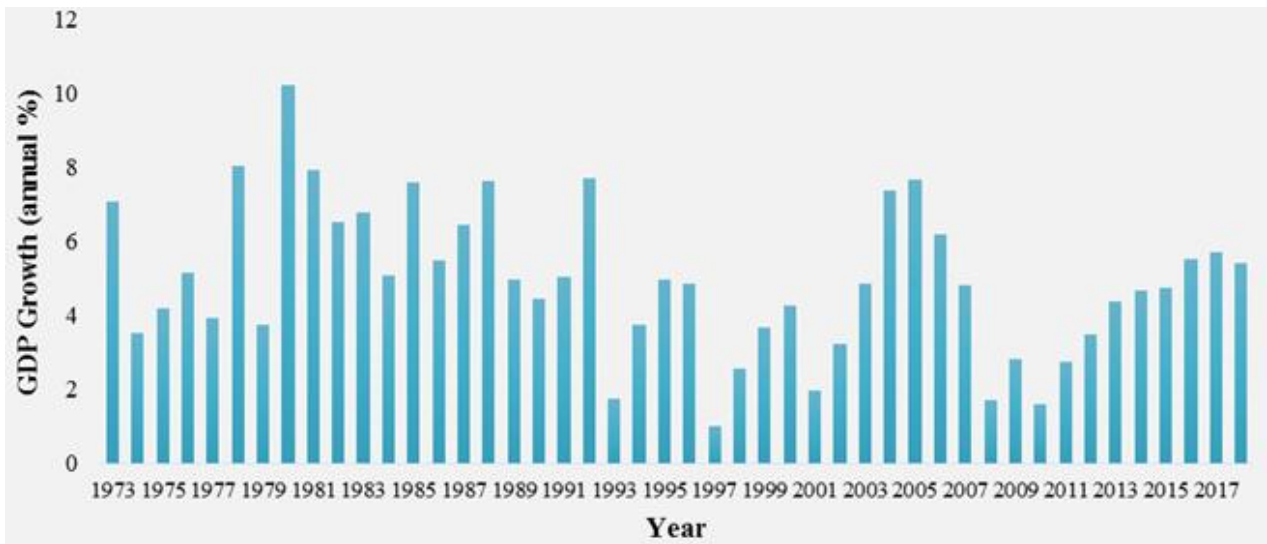
Figure-1. GDP Growth Trends in Pakistan.

Pakistan seems to be stuck in a 'low-saving low-investment trap', which is badly hampering its potentiality of economic growth performance. Much of the economic woes of Pakistan are result of low savings and investment rates in the country (Ali, 2016). According to Hussein (1995) over the last two decades, much of the differences in economic performance between Pakistan and the other Southeast Asian countries, were because of the low rates of savings and investment in Pakistan. Gross domestic savings (% of GDP) is reported 8.4% in June, 2020, which was a record low of 5.41% in 2019. In June 2020, contribution of Pakistan investment to its Nominal GDP was 15.4%. Between 1999 and 2018, Gross capital formation (formerly gross domestic investment) accelerated from 562,888 million to 5,649,450 million. Figure 2 demonstrates the trends in Pakistan's gross domestic savings and gross domestic investment between 1973-2018.
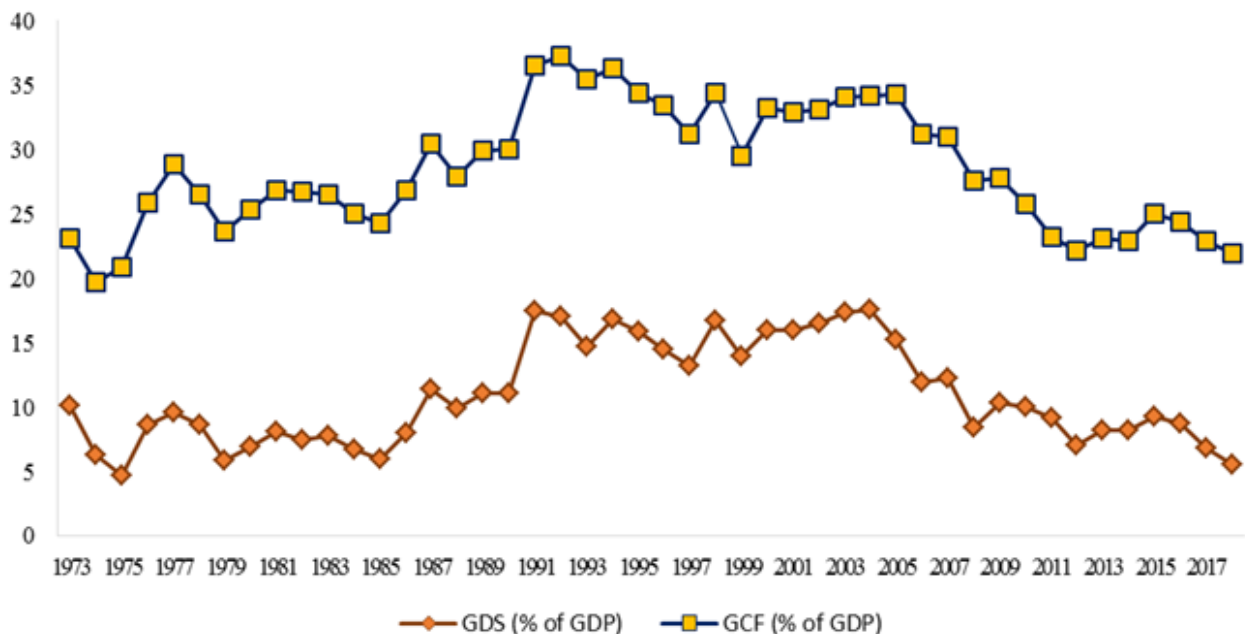

Figure-2. Gross domestic savings and gross domestic investment trends in Pakistan.

3. LITERATURE REVIEW

There is a plethora of empirical research works are available on savings, investment and economic growth in the context of developed and developing countries. This section tried to render a brief inspection of previous studies relevant to this topic. Table 1 highlights key findings of some empirical studies.

Table-1. Summary of some empirical studies.

Authors	Period	Scope	Method	Key Findings
Humbatova, Tanriverdiev, Mammadov, and Hajiyev (2020)	2010-2019	Azerbaijan	Auto Regressive Distributed Lag Bounds Testing (ARDLBT)	Gross domestic investment has a significant positive effect on economic growth both in the short and long runs.
Nhung and Nguyen (2017)	1986-2015	Vietnam	Auto Regressive Distributed Lag Bounds Testing (ARDLBT)	Domestic savings and domestic investment do not have any impacts on economic growth in the short-run but have impacts in the long-run.
Hundie (2014)	1969/70-2010/11	Ethiopia	ARDL model	Savings and investment have positive effect on economic growth.
Sekantsi and Kalebe (2015)	1970-2012	Lesotho	VEC model	Causality stemming from saving and investment to economic growth.
Hooi and Yingzhe (2009)	1955-2004	China	Cointegration method	In the short run, domestic savings and economic growth have bilateral causality but in the long run unidirectional causality runs from domestic savings to economic growth.
Amusa and Busani (2013)	1980-2008	Bostwana	Auto Regressive Distributed Lag Bounds Testing (ARDLBT)	Domestic savings is significantly positively related to economic growth.
Ngouhouo and Mouchili (2014)	1980-2010	Cameroon	Toda-Yamamoto Granger non-causality	No causal link between savings and economic growth and investment and economic growth.
Abu and Karim (2016)	1981-2011	16 Sub-Saharan African countries	VAR model	Unidirectional causality from investment and savings to economic growth
Iqbal, Ahmad, and Hussain (2012)	1973-2007	Pakistan	ARDL model	Savings and economic growth have positive association.
Joshi et al. (2019)	1975-2016	Nepal	ARDL model	Savings have a negative impact and investment has a positive impact on economic growth.
Budha (2012)	1974/75-2009/10	Nepal	ARDL model	Bidirectional short-run causality stemming from investment to gross domestic product, but no short-run causality is found between gross domestic savings and gross domestic product.
Sajid and Sarfraz (2008)	1973:1-2003:4	Pakistan	VEC Model	Bidirectional causal relationship between savings and economic growth.

Alguacil, Cuadros, and Orts (2004)	1970-2000	Mexico	Toda-Yamamoto Granger non-causality	Higher savings lead to higher economic growth.
Gylfason and Zoega (2006)	1965-1998	Whole world	Cobb-Douglas production function Regression	Economic growth is directly dependent on savings and investment.
Odey, Effiong, and Nwafor (2017)	1970-2015	Nigeria	Cointegration Analysis and Error correction model	Gross Domestic Savings and Gross Fixed Capital Formation are the main drivers of economic growth.
Mohanty (2019)	1975-2016	Ethiopia	Johansen cointegration test and Granger causality test	Bidirectional causal relationship between gross domestic saving and economic growth both in the short run and the long run.
Danisman (2012)	1975-2001	Turkey	VEC model	Saving and investment have a significant affirmative influence on economic growth in the long run.
Chaudhri and Wilson (2000)	1861−1900: 1949−1990	Australia	VAR Cointegration Test, Granger causality techniques	Relationship between investment and GDP is relatively complex.
Verma (2007)	1951-2004	India	Auto Regressive Distributed Lag Bounds Testing (ARDLBT)	Gross domestic savings do not cause growth.
Jagadeesh (2015)	1980-2013	Bostwana	ARDL, DOLS	Significant relationship between savings and economic growth.

4. EMPIRICAL MODEL AND DATA

The study aimed to investigate the dynamic impacts of domestic savings and domestic investment on economic growth of Pakistan. The underlying econometric model can be specified as:

$$lnGDPG_t = \partial_0 + \partial_1 lnGDS_t + \partial_2 lnGDI_t + \partial_3 lnPOPG_t + \partial_4 lnTO_t + \varepsilon_t \qquad (1)$$

In Equation 1 the subscript t denotes the studied time period and ε denotes the error-term. The parameters ∂_0 and $\partial_i\ (i = 1, ..., 4)$ are the intercept and the coefficients to be calculated. The dependent variable $lnGDPG$ refers the natural logarithmic form of the gross domestic product of Pakistan measured in terms of annual %, is used as a proxy variable to measure Pakistan's overall economic growth level. The variable $lnGDS$ stands for the natural logarithm of gross domestic savings measured in terms of % of GDP. The sign of ∂_1 is expected to be either positive or negative. The variable $lnGDI$ denotes the natural logarithm form of gross domestic investment, which is proxied by the gross capital formation measured in terms of % of GDP. The sign of ∂_2 is expected to portray a positive sign. The variable $lnPOPG$ refers to the natural logarithmic form of the population growth of Pakistan measured in terms of annual %. The sign of ∂_3 is expected to be either positive or negative, because population

growth is not blessing for all countries, especially for developing countries and sometimes more population become burden for the country which may detrimental to economic growth of the country. Finally, the variable *lnTO* stands

for natural logarithmic form of the trade openness, which is proxied by the trade (% of GDP). The sign of ∂_4 is

expected to be positive as trade openness may contribute positively to the economic growth process. All the variables are used in natural logarithmic form to attain more accurate empirical results. Using this natural logarithmic form has some advantages than using the level form of variables. The study has taken annual data from 1973 to 2018. The data of all variables used for the empirical analysis are gathered from the World Development Indicators database of the World Bank.

5. ECONOMETRIC METHODOLOGY

The econometric analysis starts with the identification of the stationarity of the considered variables in the econometric model. Unit root test is done by using Augmented Dickey–Fuller (ADF) test (Dickey & Fuller, 1979) and Phillips and Perron (1988) tests. Johansen cointegration test (Johansen, 1991; Johansen, 1988) has been applied to identify the long-run association among the variables. The study used Dynamic Ordinary Least Squares (DOLS) technique developed by Stock and Watson (1993) to estimate the regression results. To identify the causal relationship and causality direction, pairwise Granger causality tests (Granger, 1969) have been done. Some diagnostic tests are also done for confirming how robust the regression model is. Breusch-Pagan-Godfrey Heteroscedasticity Test was applied to detect the heteroscedasticity problem. Then, Durbin Watson test was applied to test the autocorrelation problem. Further, Breusch-Godfrey Serial Correlation LM test was also applied to test the serial correlation problem. Jarque-Bera (JB) Test was applied to test normality of error term. CUSUM and CUSUMSQ tests has been applied to test stability of the model.

6. RESULTS AND DISCUSSIONS

The results obtained from the Augmented Dickey–Fuller (ADF) and Phillips-Perron unit root analysis are reported in Table 2. It is evident from the table, all the variables despite being non-stationary at their level, I(0), are stationary at their first differences, I(1).

Table-2. Results of unit root tests.

Test	ADF		PP		Order of Integration
Variable	Level, I(0)	1st Difference, I(1)	Level, I(0)	1st Difference, I(1)	
lnGDPG	–1.539	–10.064***	–1.658	–21.515***	I(1)
lnGDS	–1.459	–7.354***	–1.446	–15.927***	I(1)
lnGDI	–1.811	–6.291***	–1.810	–6.289***	I(1)
lnPOPG	–2.197	–4.399***	–2.201	–3.285*	I(1)
lnTO	–2.826	–7.243***	–2.851	–8.476***	I(1)

Note: The reported test statistics are calculated considering both constant and trends under the null hypothesis of non-stationarity against the alternative hypothesis of stationarity; optimal lags are based on SIC; *** and * denote statistical significance at 1% and 10% levels respectively.

The Johansen cointegration test follows the results of unit root tests and the results are presented in Table 3. The statistically significant test statistics of trace test and maximum eigenvalue test reject the null hypothesis of no cointegration and affirms the presence of long-run cointagrating relationships between the GDP growth and gross domestic savings, gross domestic investment, population growth and trade openness.

The long-run elasticities are estimated applying the DOLS estimation approach. The estimated results from regression analysis are portrayed in Table 4. The results demonstrate that savings have a negative impact on economic growth, that means gross domestic savings are not effective in enhancing the gross domestic product growth figures of Pakistan.

Table-3. Results of the Johansen cointegration test.

Null Hyp.	Alternat. Hyp.	Trace Test			Max. Eigenvalue Test		
		Test Statistic	5% Critical Value	No. of Cointegrating equations	Test Statistic	5% Critical Value	No. of Cointegrating Equations
r <=0	r =1	111.387**	69.818		54.687**	33.876	
r <=1	r =2	56.700**	47.856	3	24.395	27.584	1
r <=2	r =3	32.305**	29.797				
r <=3	r =4	14.247	15.494				

Note: r refers to the number of cointegrating equations; the optimal lag selection is based on the AIC; ** denotes statistical significance at 5% level.

A rise in gross domestic savings is found to reduce the GDP growth level by 0.73%, on average, ceteris paribus and this result is statistically significant at 1% level of significance. Similar result is found from the study by Joshi et al. (2019); Verma (2007) and Bist and Bista (2018). Therefore, it can be inferred that the tendency of savings is detrimental to the growth process of Pakistan. Thus, the importance of making these domestic savings into investment to increase the overall level of economic growth in Pakistan can be understood from these regression estimates. A positive correlation between gross domestic investment and GDP growth reveal that gross domestic investment is effective in incrementing gross domestic product growth of Pakistan. The estimated elasticity value show that if gross domestic investment rises by 1%, it will increase GDP growth figure by 1.52%, on average, ceteris paribus. This finding is consistent with the finding of Joshi et al. (2019). Therefore, it is pertinent for the economy of Pakistan to enhance gross domestic investment to attain higher growth performances. The positive sign of the elasticity parameter attached to population growth show that population growth positively contributes to the gross domestic product growth level of Pakistan. When population growth rises by 1%, then GDP growth rises by 0.91%, on average, ceteris paribus. Finally, the elasticity value attached to trade openness reveal that, a 1% increase in trade openness declines GDP growth by 0.60%, on average, ceteris paribus. But this result is not statistically significant. Therefore, trade openness is not conducive to enhance the economic growth level of Pakistan.

The obtained R-squared value of 0.643 indicates that 64.3% variation in the dependent variable, which is lnGDPG is explained the considered explanatory variables, lnGDS, lnGDI, lnPOPG and lnTO. As the R-squared value has been able to explain more than 50% variation present in dependent variable, so it can be said that the considered independent variables are dominant.

Table-4. Results of the long-run elasticities.

Dependent Variable	lnGDPG
Estimator	DOLS
lnGDS	-0.732*** (0.164)
lnGDI	1.526* (0.886)
lnPOPG	0.905* (0.466)
lnTO	-0.602 (0.778)
Constant	-0.029 (0.988)
R-squared	0.643
Adjusted R-squared	0.423
Observations	43

Note: The optimal lag selection is based on AIC; the standard errors are given in the parentheses; *** and * denotes statistical significance of t-statistic at 1% and 10% levels respectively.

Finally, to explore the causal relationships among the considered variables in the context of Pakistan, pairwise Granger causality analysis is conducted. The findings from the causality analysis are summarized in Table 5. The statistical significance of the F-statistics confirms bidirectional casual nexus between gross domestic savings and economic growth of Pakistan. Similar result is found from a study by Mohanty (2019) in the context of Ethiopia. The results also reveal unidirectional causalities stemming from between economic growth to gross domestic

investment and to trade openness. But no causal relationship is established between population growth and economic growth.

Null Hypothesis	F-Statistics
lnGDS ≠→ lnGDPG	2.872*
lnGDPG ≠→ lnGDS	3.395*
lnGDI ≠→ lnGDPG	0.025
lnGDPG ≠→ lnGDI	11.099***
lnPOPG ≠→ lnGDPG	1.209
lnGDPG ≠→ lnPOPG	1.764
lnTO ≠→ lnGDPG	0.374
lnGDPG ≠→ lnTO	4.436**

Note: ≠→ indicates does not Granger causes; ***, ** and * denote the statistical significance of the estimated F-statistic at 1%, 5% and 10% levels of significance, respectively.

Results of diagnostic tests have been reported in Table 6. Result of Breusch-Pagan-Godfrey heteroscedasticity test confirms that there is no heteroscedasticity problem in this analysis. From this result, it is clear that independent variable is significant predictor of data. Result of Breusch-Godfrey serial correlation LM test shows that there is no serial correlation between the variables. Application of the Jarque-Bera (J-B) test shows that the J-B statistic is 0.726 and the probability of obtaining such a statistic under the normality assumption is about 69%, which is quite high. Therefore, the study did not reject the hypothesis that the error terms are normally distributed that means error terms are normally distributed.

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Test Statistics	LM (χ^2)
Heteroscedasticity	0.666
Serial Correlation	0.339
Normality Test	0.695

In Figure 3 and Figure 4, the blue lines, representing the CUSUM of recursive residuals and CUSUMSQ residuals are within the red lines, which mean that the regression model is fit and stable.
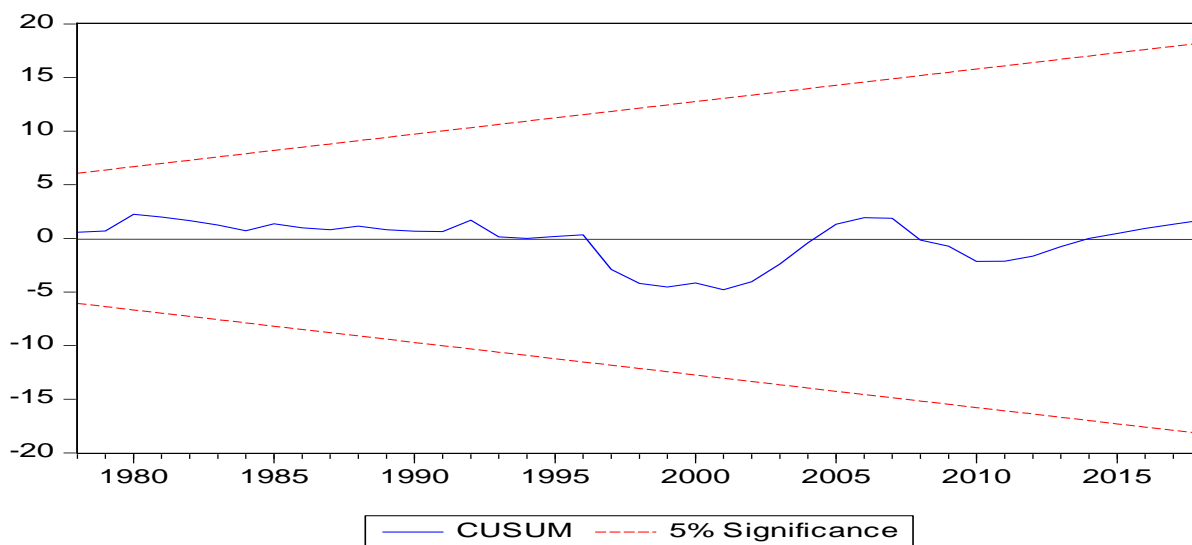

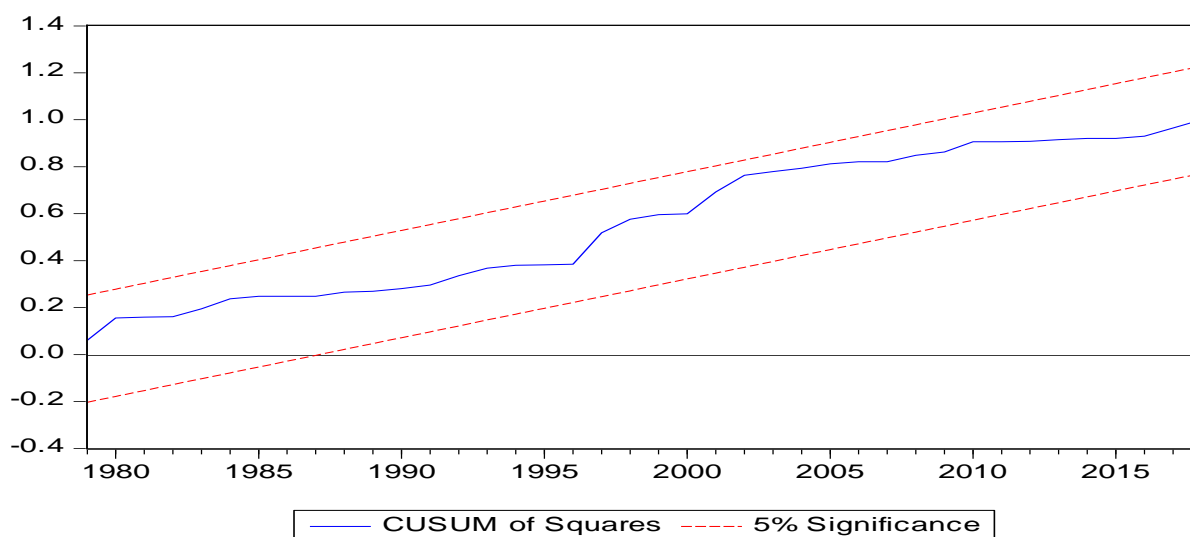**Figure-3.** Cumulative sum of recursive residuals.

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Figure-4. Cumulative sum of squared residuals.

7. CONCLUSIONS AND RECOMMENDATIONS

The saving rates and investment in Pakistan could not able to attain expected growth in the past three decades and led to slow economic growth. Thus, this paper scrutinized the impacts of savings and investment on economic growth of Pakistan empirically taking yearly data spanning from 1973 to 2018. The results obtained from the empirical analyses explored that how the economic growth level of Pakistan is being affected by savings and investment activities. Therefore, in a nutshell, the empirical findings provide two important outcomes. One is gross domestic savings negatively affects economic growth potential of Pakistan. Another one is, gross domestic investment positively contributes to the economic growth of Pakistan. Besides, the findings from the causality analysis affirm bidirectional causal association between gross domestic savings and economic growth and a unidirectional causal linkage between gross domestic investment and economic growth.

Hence, considering these findings, it is recommended that the Pakistani government should encourage their citizen to invest their domestic savings in productive activities ensuring profitable business environment for the sake of sustainable long term growth performances. Because, domestic investment in the business sector of Pakistan is critically significant to boost economic growth. Remittances are contributing towards the higher savings in Pakistan and effective policies are needed to transfer the remittances and to create job opportunities for Pakistanis people living in abroad. Since domestic saving is a major source of investment in Pakistan, so continuity of conducive environment for businesses have to be ensured. The government of Pakistan should launch some lucrative schemes to increase people's investment in the country to implement proper policies to achieve the desired goals. Besides, the government should design a coherent industrial policy and provide adequate incentives to the investors. The regulatory institutions should be strengthened to protect and enforce the private intellectual rights suitably. The role of the government cannot be overemphasized. Moreover, the government should reduce its overall budget deficit and also focus on mobilizing funds from non-bank sector.

REFERENCES

Abu, N., & Karim, M. Z. A. (2016). The relationships between foreign direct investment, domestic savings, domestic investment, and economic growth: The case of Sub-Saharan Africa. *Society and Economy in Central and Eastern Europe, 38*(2), 193-217.Available at: http://dx.doi.org/10.1556/204.2016.38.2.4.

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Alguacil, M., Cuadros, A., & Orts, V. (2004). Does saving really matter for growth? Mexico (1970–2000). *Journal of International Development: The Journal of the Development Studies Association, 16*(2), 281-290.

Ali, A. (2016). Saving and Investment in Pakistan. *SBP Staff Notes*, 1-16.

Amusa, K., & Busani, M. (2013). Savings and economic growth in Botswana: An analysis using bounds testing approach to cointegration. *Journal of Economics and Behavioral Studies, 5*(4), 200-209.

Bist, J. P., & Bista, N. B. (2018). Finance–growth nexus in Nepal: An application of the ARDL approach in the presence of structural breaks. *Vikalpa, 43*(4), 236-249.Available at: https://doi.org/10.1177/0256090918813211.

Budha, B. (2012). A multivariate analysis of savings, investment and growth in Nepal. Munich Personal RePEc Archive Working Paper No. 43346.

Cass, D. (1965). Optimum growth in an aggregative model of capital accumulation. *The Review of Economic Studies, 32*(3), 233-240.Available at: https://doi.org/10.2307/2295827.

Chatterjee, S., Sakoulis, G., & Turnovsky, S. J. (2003). Unilateral capital transfers, public investment, and economic growth. *European Economic Review, 47*(6), 1077-1103.Available at: http://doi.org/10.1016/S0014-2921(02)00235-0.

Chaudhri, D., & Wilson, E. (2000). Savings, investment, productivity and economic growth of Australia 1861–1990: Some explorations. *Economic Record, 76*(232), 55-73.Available at: https://doi.org/10.1111/j.1475-4932.2000.tb00005.x.

Danisman, R. (2012). The effects of savings and investments on economic growth in Turkey (1975-2010). Retrieved from: https://www.slideshare.net/RmeysaDanman/savingsinvestmentseconomic-growth.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American statistical association, 74*(366a), 427-431.Available at: https://doi.org/10.2307/2286348.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: journal of the Econometric Society, 37*(3), 424–438.

Gylfason, T., & Zoega, G. (2006). Natural resources and economic growth: The role of investment. *World Economy, 29*(8), 1091-1115.Available at: https://doi.org/10.1111/j.1467-9701.2006.00807.x.

Heijdra, B. J. (2017). Foundations of modern macroeconomics (3rd ed., pp. 944): Oxford University Press.

Hooi, H. L., & Yingzhe, S. (2009). The domestic savings and economic growth relationship in China. *Journal of Chinese Economic and Foreign Trade Studies, 2*(1), 5-17.

Humbatova, S. I., Tanriverdiev, S. M., Mammadov, I. N., & Hajiyev, N. G. (2020). Impact of investment on GDP and non-oil GDP in Azerbaijan *Entrepreneurship and Sustainability Issues, 7*(4), 2645-2663.Available at: http://doi.org/10.9770/jesi.2020.7.4(6.

Hundie, S. K. (2014). Savings, investment and economic growth in Ethiopia: Evidence from ARDL approach to co-integration and TYDL Granger-causality tests. *Journal of Economics and international finance, 6*(10), 232-248.Available at: https://doi.org/10.5897/jeif2014.0600.

Hussein, A. M. (1995). Long-run determinants of private saving behavior in Pakistan. *The Pakistan Development Review, 34*(4), 1057-1066.

Iqbal, M. Z., Ahmad, N., & Hussain, Z. (2012). Impact of savings and credit on economic growth in Pakistan. *Pakistan Journal of Social Sciences (PJSS), 32*(1), 39-48.

Jagadeesh, D. (2015). The impact of savings in economic growth: An empirical study based on Botswana. *International Journal, 10.*

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica: Journal of the Econometric Society, 59*(6), 1551-1580.Available at: https://doi.org/10.2307/2938278.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control, 12*(2-3), 231-254.Available at: https://doi.org/10.1016/0165-1889(88)90041-3.

Joshi, A., Pradhan, S., & Bist, J. P. (2019). Savings, investment, and growth in Nepal: An empirical analysis. *Financial Innovation, 5*(1), 1-13.

Keynes, J. M. (1936). The general theory of interest, employment and money. *Reprinted in The Collected Writings of John Maynard Keynes, 7.*

Koopmans, T. C. (1965). *On the concept of optimal economic growth, in the econometric approach to development planning.* Amsterdam: North-Holland.

Lewis, A. W. (1954). Economic development with unlimited supplies of labor. *The Manchester School, 22*(2), 139-191.

Maki, T., Yotsuya, K., & Yagi, T. (2005). Economic growth and the riskiness of investment in firm-specific skills. *European Economic Review, 49*(4), 1033-1049.Available at: http://doi.org/10.1016/j.euroecorev.2003.08.001.

Mason, A. (1988). Saving, economic growth, and demographic change. *Population and Development Review, 14*(1), 113-144.

Mohanty, A. K. (2019). Does domestic saving cause economic growth? Time-series evidence from Ethiopia. *International Journal of Management, IT and Engineering, 7*(10), 237-262.Available at: https://doi.org/10.1016/j.jpolmod.2009.08.008.

Nasir, S., Khalid, M., & Mahmood, A. (2004). Saving-investment behaviour in Pakistan: An empirical investigation [with Comments]. *The Pakistan Development Review, 43*(4), 665-682.Available at: https://doi.org/10.30541/v43i4iipp.665-682.

Ngouhouo, I., & Mouchili, E. (2014). Saving, investment and economic growth in cameroun: A multivariate approach. *International Journal of Economics and Finance, 6*(9), 244-253.Available at: https://doi.org/10.5539/ijef.v6n9p244.

Nhung, K. T., & Nguyen, H. H. (2017). Impacts of domestic savings on economic growth of Vietnam. *Asian Journal of Economic Modelling, 5*(3), 245-252.Available at: http://dx.doi.org/10.18488/journal.8.2017.53.245.252.

Odey, F. I., Effiong, C. E., & Nwafor, J. U. (2017). Savings-investment and economic growth nexus in Nigeria. *International Journal of Development and Economic Sustainability, 57*(1), 1-14.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrics, 75*(2), 335-346.

Ramsey, F. P. (1928). A mathematical theory of saving. *The Economic Journal, 38*(152), 543-559.Available at: https://doi.org/10.2307/2224098.

Sajid, G., & Sarfraz, M. (2008). Savings and economic growth in Pakistan: An issue of causality. *Pakistan Economic and Social Review, 46*(1), 17-36.

Sekantsi, L. P., & Kalebe, K. M. (2015). Savings, investment and economic growth in Lesotho: An empirical analysis. *Journal of Economics and International Finance, 7*(10), 213-221.Available at: https://doi.org/10.5897/jeif2015.0708.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics, 70*(1), 65-94.

Stock, J. H., & Watson, M. W. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica: Journal of the Econometric Society, 61*(4), 783-820.Available at: https://doi.org/10.2307/2951763.

Verma, R. (2007). Savings, investment and growth in India: An application of the ARDL bounds testing approach. *South Asia Economic Journal, 8*(1), 87-98.Available at: https://doi.org/10.1177/139156140600800105.

World Bank. (2020). *World development indicators database.* Washington, DC: The World Bank.