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**An Analysis of the Determinants of
National Savings and Total
Investment in Pakistan**

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**PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS
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LIST OF ABBREVIATIONS

Abbreviation	Full Form
AD	Age Dependency Ratio
DIR	Deposit Interest Rate
DS	Domestic Savings
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
LIR	Lending Interest Rate
NSS	National Saving Scheme
NS	National Savings
OLS	Ordinary Least Squares
PD	Public Debt
RMT	Personal Remittances
SBP	State Bank of Pakistan
TI	Total Investment
TOT	Terms of Trade
WEO	World Economic Outlook
GDPG	Gross Domestic Product Growth Rate
GNP	Gross National Product
MPC	Marginal Propensity to Consume

CONTENTS

Abstract	v
1. Introduction	1
2. Overview of Pakistan's Economy	2
2.1. Savings-Investment Gap of Pakistan	4
3. Literature Review	5
3.1. Theoretical Literature	5
3.2. Empirical Literature	7
3.3. Synthesis of Literature Review	10
3.4. Research Gap	11
4. Data and Methodology	12
4.1. OLS Estimation: Theoretical and Empirical Rationale	12
5. Results and Discussion	13
5.1. National Savings Function	13
5.2. Total Investment Function	15
6. Conclusion	17
7. Policy Implications	18
References	18

List of Tables

Table 1. Growth Rates (Percent) of Pakistan	2
Table 2. Major Savings Theories	6
Table 3. Major Investment Theories	6
Table 4. Selected Empirical Literature on Savings Behaviour	7
Table 5. Selected Empirical Literature on Investment Behavior	9
Table 6. Results for Savings Function	14
Table 7. Results for Investment Function	16

List of Figures

Fig. 1.1. Gross National Savings (% of GDP)	3
Fig. 1.2. Total Investment (% of GDP)	4
Fig. 1.1. Structure of Savings and Investment (% of GDP)	5
Fig. 5.1. National Savings with Step-Ind 1	13
Fig. 5.2. National Savings and Inflation Trends	14
Fig. 5.3. Total Investment and FDI Trends with SIS/IIS Interventions	16

ABSTRACT

This study investigates the major determinants of national savings and total investment in Pakistan from 1981 to 2023 using the ordinary least squares (OLS) approach. The results of the savings function suggest that savings in Pakistan are significantly influenced by inflation, remittances, GDP, deposit rates, and the age dependency ratio. On the other hand, foreign direct investment (FDI) and gross domestic product (GDP) are found to be positive determinants of total investment. However, a comparison with selected Asian countries reveals that Pakistan lags behind all of them in both savings and investment rates. To follow the path of sustained economic growth taken by these countries, Pakistan needs to increase its total investment through higher national savings. Moreover, both savings and investment can be enhanced in the economy through operational policy measures that take into account the key determinants of both national savings and total investment.

Keywords: National Savings, Total Investment, Inflation, FDI, GDP, Pakistan.

1. INTRODUCTION

The economic performance of a country is influenced by multiple factors. Among such factors, the two key macroeconomic variables are savings and investment, which play a significant role in promoting economic growth. Therefore, the role of savings and investment in the development process has been extensively examined in the literature (e.g., Thomas, 2006; Mualley, 2011; Sajid & Sarfaraz, 2008; Mohan, 2006).

Both the classical and modern economic theories, such as Harrod-Domar and Solow growth models, focused on the fact that higher savings facilitate capital formation and investment, thus enhancing productive capacity and long-term economic growth. Therefore, as per the Harrod-Domar (1946)¹ economic growth model, the economic growth rate of a country is well defined by the level of savings and the capital output ratio (the amount of capital needed to produce one unit of output). Hence, a prerequisite for higher investment is the availability of higher savings. The Solow (1956) growth model also suggests that savings affect the economic growth through increased capital formation, which consequently leads to economic growth. Moreover, the new growth theories of 1980s (e.g., Romer, 1986, 1990; Barro, 1990; and Lucas, 1988) reconfirmed the view that high saving rates are important for higher GDP growth rates. In the economic literature, the major determinants of high savings rates are population growth, economic growth, per capita income, terms of trade, foreign capital, interest rate, inflation, tax rate, and foreign savings, among others (see Fry, 1995; Gupta, 1993; Edwards, 1996; Ali, 2016; & Khan, 1988). On the other hand, the major determinants of investment are cost of finance, bank credit, foreign capital inflows, imports, exports, foreign aid, private capital outflows, workers' remittances, development of financial institutions, among others e.g. see Blejer & Khan (1984); Jorgenson (1967); Guimaraes & Unteroberdoerster (2006); Sakr (1993); Veemon & Mataya (1996); Khan (1988); Looney (1997). Moreover, higher level of savings and investment not only reduce a country's foreign capital dependency but also play a vital role in the deployment of domestic resources (Lewis, 1954). Therefore, a deep understanding of the determinants of savings and investment is crucial for suggesting effective economic policies.

From Pakistan's perspective, Husain (1995) discussed that many of the differences in economic performance between Pakistan and other South Asian countries were attributable to Pakistan's low rates of savings and investment. Therefore, as a developing country, Pakistan should adopt policies that enhance its savings in order to enhance its economic growth. Also, Pakistan's economic growth remained low due to rising foreign debt and debt servicing, high inflation, political instability, low exports, low investment in human capital, and the poor law and order situation of the country. Furthermore, Pakistan has been stuck in a low-saving and low-investment trap², which has significantly stifled its growth potential. A low savings rate limits the availability of investable funds, while inadequate investment hampers sustainable economic growth. This slow growth, in turn, generates fewer domestic savings, thus perpetuating the cycle. Historically, in Pakistan, all periods of high growth have coincided with substantial inflows of foreign savings, such as external loans, grants, and remittances, and when these inflows diminish, economic growth weakens because by then the domestic savings and investment are insufficient to sustain this momentum.

¹ The Harrod-Domar model is a Keynesian economic growth model that proposes economic growth of a country depends on its level of savings and accumulated capital.

² In 2003 Pakistan's savings peaked at 24.5 percent and since then it declined continually resulting in low savings and investment trap.

However, despite various policy interventions during the last several decades, Pakistan has persistently experienced low savings and investment rates compared with its neighboring countries, which has constrained its productivity growth, employment generation, and economic development. In this context, identifying the factors responsible for low savings and investment is of considerable policy importance. Moreover, the past literature has examined such factors for the case of Pakistan, but most of them focused on either investment or savings and relied relatively on old datasets. Therefore, to capture the impact of recent decades (i.e., demographic transitions, increased remittance inflows, changes in inflation, rising public debt, and fluctuating foreign investment), it is imperative to conduct a fresh empirical assessment using updated data. Hence, the objective of this study is based on three motivations. First, the extraordinary importance of savings and investment for economic development. Second, consistent low savings and investment are a big challenge for Pakistan compared to its regional countries. Finally, there exists a lack of in depth analysis that jointly examines the determinants of both savings and investment for a long period. To achieve this objective, this study has employed the ordinary least squares (OLS) approach to investigate the determinants of savings and investment functions for the case of Pakistan over the period 1981-2023.

The rest of the paper is arranged as follows: Section 2 provides a brief view of Pakistan's economy in terms of its savings and investment behavior, especially with respect to selected Asian countries. Section 3 presents the theoretical framework and the most relevant brief empirical literature review, while Section 4 describes the data sources and methodology of the paper. Section 5 provides results and discussion, and Section 6 concludes the study. Finally, Section 7 offers policy implications derived from the findings of this study.

2. OVERVIEW OF PAKISTAN'S ECONOMY

Table 1 shows the trends of savings and investment in Pakistan and highlights the relationship among three key macroeconomic variables i.e. GDP, national savings and total investment during the last four decades.

Table 1
Growth Rates (Percent) of Pakistan

	GDP	National Savings	Total Investment
1980s			
Standard Deviation	3.11	15.60	3.68
Average	13.83	14.99	13.07
Maxima	18.30	43.59	19.65
Minima	8.97	-5.40	9.52
Coefficient of Variation	0.23	1.04	0.28
1990s			
Standard Deviation	4.42	35.59	7.86
Average	13.98	15.22	12.26
Maxima	19.53	91.37	26.46
Minima	7.11	-41.10	-3.56
Coefficient of Variation	0.32	2.34	0.64
2000s			

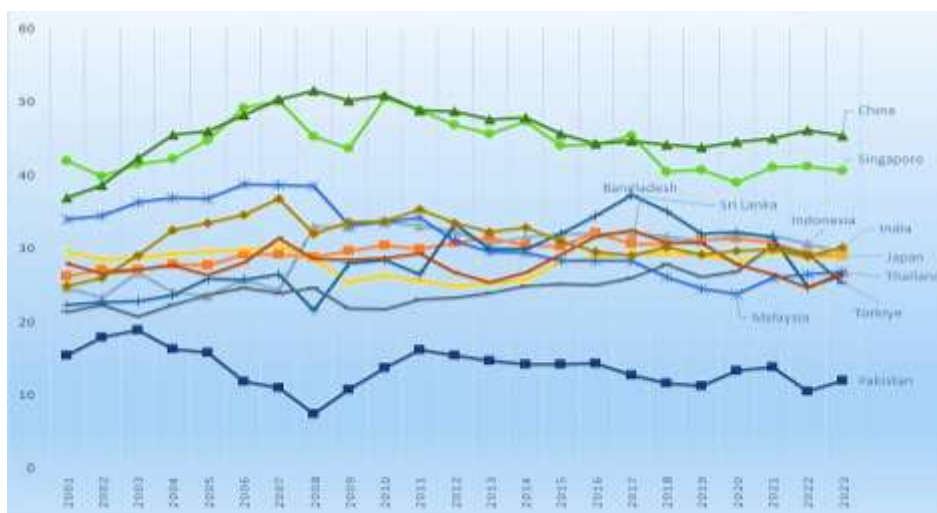
	GDP	National Savings	Total Investment
Standard Deviation	3.08	17.55	7.94
Average	12.40	12.67	12.37
Maxima	16.28	46.01	26.34
Minima	6.62	-11.34	-0.28
Coefficient of Variation	0.25	1.39	0.64
2010s			
Standard Deviation	3.47	12.46	5.02
Average	11.21	12.14	10.44
Maxima	19.53	31.72	17.41
Minima	7.56	-6.56	1.49
Coefficient of Variation	0.31	1.03	0.48
2020-21	17.45	19.00	15.22
2021-22	19.35	-3.51	26.34
2022-23	26.15	54.28	12.41

Source: Author's Computation.

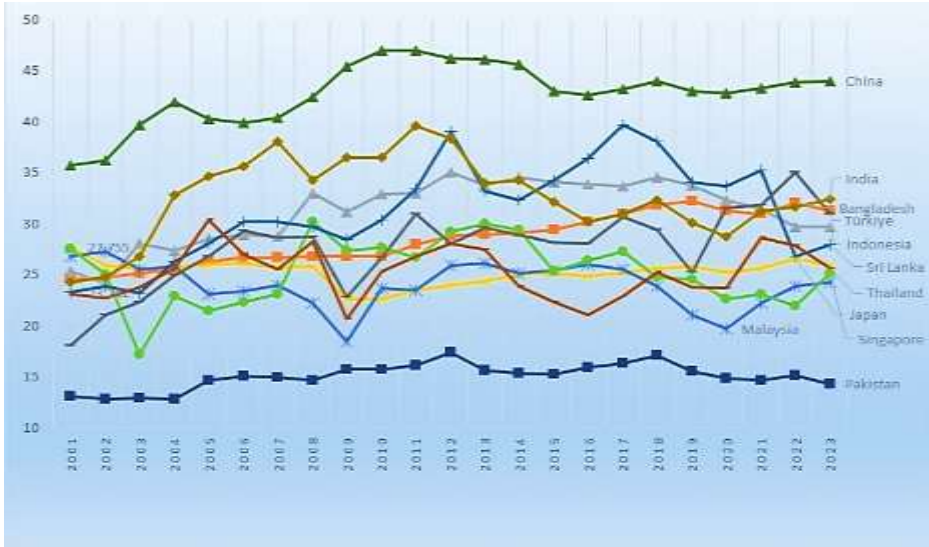
During almost all of the reported decades, the growth rate of national savings was more volatile than that of the GDP and investment (See coefficient of variation). Moreover, the growth rate of GDP on average remained in the range of 9-17 percent, investment in the range of 10–20 percent and savings in the range of 12–21 percent during the period under review. To address the persistent weakness in the national savings, the program of Structural Adjustment Programme (SAP)³ was launched in 1989-90. In addition, the government has rationalised the National Savings Scheme (NSS) by offering very attractive returns on various certificates and bonds.

A comparison of Pakistan with selected Asian economies in terms of savings and investment performance is presented below in Figures 1.1 and 1.2.

Fig 1.1. Gross National Savings (% of GDP)



³ SAP restrict the government to abstain bank borrowing to finance its budget deficit.

Fig 1.2. Total Investment (% of GDP)

During the decades of the 1960s and 1970s, Pakistan's total investment as percent of GDP was almost comparable to that of most Asian countries (Nasir, et al. 2004). However, during later decades up to 2023, Pakistan's total investment rate remained largely stagnant, fluctuating between 12 and 17 percent of GDP. As a result, Pakistan recorded the lowest investment rate among the selected Asian countries, as shown in Figure 1.2. In contrast, the investment rate of other countries ranged between 20 percent and 47 percent during 2001-2023. Similarly, the gross national savings of Pakistan as percent of GDP performed even more poorly than its total investment rate (see Fig 1.1). Consequently, both the investment and savings rates of Pakistan are lower than all other Asian countries. These figures suggest that the aforementioned Asian countries not only achieved higher savings and investment rates but also sustained them over time, thereby supporting higher and more sustained economic growth.

2.1. Savings-Investment Gap of Pakistan

In 2015, Pakistan ranked 151st out of 175 countries in terms of its investment rate, significantly lower than Asian countries including India (32nd), Sri Lanka (36th) and Bangladesh (40th)⁴.

As shown in Figure 1.3, in Pakistan, the savings-investment gap has been negative for most years. The persistent imbalance has continued over time and poses a big challenge to the economy. It could become more problematic if Pakistan's liabilities to the rest of the world exceed the value of its foreign assets. The major drivers behind this persistent imbalance are several structural economic challenges such as a large trade deficit, high inflation, a low capital output ratio, persistent fiscal deficits, rapid population growth, and weak currency. Consequently, Pakistan has remained trapped in a low-savings and low-investment cycle, which is one of the major factors behind its slow economic growth.

⁴ Amjad Ali, 2016; SBP Staff Notes, 01/16, Saving and Investment in Pakistan.

Fig. 1.3. Structure of Savings and Investment (% of GDP)



Source: Author Computation using World Economic Outlook Database.

In a nutshell, a negative savings-investment gap is neither inherently good nor bad. There are countries that traditionally maintain high savings rates, and they require dissaving countries to absorb their surplus savings; otherwise they might find it difficult to sustain those high levels of savings. However, at the same time, such countries face many risks associated with exposure to external debt, foreign business cycles, and fluctuations in foreign currencies over time. On the other hand, if dissaving countries continue to experience persistently low savings rates, their debt burden may continue to rise. Therefore, the risk of borrowing at higher interest rates and accumulating liabilities that exceed the value of their assets may increase. This situation could ultimately create financial imbalances and contribute to instability in the global economy.

3. LITERATURE REVIEW

3.1. Theoretical Literature

The theoretical foundation of the present study is built on the Harrod-Domar Growth Theory. The key concept of this theory is based on the fact that economic growth depends on the level of savings and the productivity of employed capital. The higher level of savings increases the availability of funds for future investment leading to economic growth, this concept is in line with the Solow Growth Model as well. The determinants of the savings function are derived from the Life-Cycle Hypothesis and Permanent Income Hypothesis. The rationale of these theories suggests that individuals make savings decisions based on expected lifetime income, consumption needs, and demographic characteristics. For this reason, the current study has employed the variables such as GDP growth, remittances, inflation, interest rates, and age dependency ratio in the savings model. The determinants of investment function are derived from the Neoclassical Theory of Investment and Accelerator Theory. The Neoclassical approach suggests that investment is influenced by the cost of capital, availability of finance, and expected profitability, however the Accelerator Theory links the investment to economic growth and output expansion. Therefore, variables such as domestic savings, lending interest rates, foreign direct investment, public debt, and GDP are used as determinants of total investment function in this study. For detailed theoretical development of savings and investment functions see Tables 2 and 3.

Table 2
Major Savings Theories

Harrod Domar Savings investment theory	According to the Harrod-Domar (1939 & 1946) ⁵ economic growth model economic growth rate of a country depends on its savings and the capital output ratio (i.e. the amount of capital needed to produce one unit of output).
Solow Savings Theory	The Solow Savings Theory emphasizes that the savings rate decides the level of capital and output in the long run, but technological progress is the pre requisite factor driving sustainable economic growth of a country.
Lucas Savings Theory	Lucas's Savings Theory centers around rational expectations and the way persons plan their savings and consumption over time to optimize their long-term utility. This approach emphasizes how forward-looking behavior and expectations influence savings decisions.
Absolute Income Hypothesis	Savings is a positive function of current income. As income increases, a large portion of income is saved by individuals, leading to an increase in aggregate savings.
Relative Income hypothesis (1949)	Individuals' consumption and savings decisions are prejudiced by their income relative to others and their own previous income levels and standard of living.
Life Cycle Hypothesis	Savings patterns are influenced by anticipated future income and life expectancy.
Permanent Income Hypothesis	Individuals save only when their current income level is higher relative to their permanent income (i.e. expected long-term income) and dis-save when their current income is lower.
Precautionary Savings Hypothesis	Precautionary savings are resources during unexpected downturns or emergencies.
Buffer Stock Theory	A specific buffer stock is saved by individuals to smooth consumption in response to their future income fluctuations and uncertainties.
New Growth Theories	Romer (1986,1990); Barro (1990); Lucas (1988)- higher savings are needed for economic growth.

Table 3
Major Investment Theories

The Accelerator Theory of Investment	The key idea behind the theory is that investment is not driven by profitability alone, but by the rate of change in economic activity. The relationship is typically expressed in the form of a "capital-output ratio," meaning that firms will invest more as long as they expect future increases in demand to be sustained. This theory postulates that when demand for goods and services increases, as a consequence the firms respond by increasing their investment in capital (such as machinery, equipment, and infrastructure) to produce more output. Conversely, when demand falls, firms reduce their investment.
The Internal Funds Theory of Investment	According to this theory the profit level of the firm determines the required capital stock. At first, the firms use their internal funds (such as retained earnings or profits) to finance new investment projects because internal funds are less costly and do not involve the risks associated with external financing, such as interest obligations or loss of control due to issuing new shares.

⁵The Harrod–Domar model is built on Keynesian economic growth model and it explains an economy's growth rate in terms of the level of saving and capital.

The Neoclassical Theory of Investment Savings and Investment Theory	According to this theory firms decide on the optimal level of capital investment based on the principles of profit maximization and cost minimisation. This theory assumes that the economy is always in full employment equilibrium and investments and savings are equal and interest rates bring this parity. Moreover, the decline in the interest rates promote investment when savings outperforms investments, and vice versa.
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3.2. Empirical Literature

A number of empirical studies have investigated the determinants of savings and investment in the context of developed and developing countries. Table 4 and 5 highlight the key findings of some important empirical studies based on savings and investment functions analysis.

Table 4
Selected Empirical Literature on Savings Behaviour

Authors	Period	Scope	Method	Key Findings
Odey, Effiong, and Nwafor (2017)	1970-2015	Nigeria	Cointegration Analysis and Error correction model	The fundamental drivers of economic growth are fixed investment and gross domestic savings.
Nasir, et al. (2004)	1971- 200	Pakistan	Ordinary Least Square (OLS)	Savings and fiscal deficit are inversely related and the real interest rate has positive influence on savings highlighting the existence of substitution effect as compared to income effect. Also, remittances and savings are positively associated.
Mualley (2011)	1990 -1999	African countries	Ordinary Least Square (OLS) using cross section data	In selected African countries the savings are elastic to income only.
Jilani, Sheikh, Cheema & Shaik (2013)	1973 – 2011	Pakistan	Co-integration and Error correction model	Inflation, fiscal policy, and GDP have significant relationship with Pakistan's savings rate.
Khan, et al. (1992)	1959 – 1988	Pakistan	Co-integration Technique	National savings is positively related with real interest rate, per capita GNP, TOT change and openness. However, debt to GNP ratio and dependency ratio are negatively associated with national savings.
Husain (1996)	1970-93	Pakistan	Co-integration Analysis	Financial development and financial deepening positively affect national savings.

Authors	Period	Scope	Method	Key Findings
Qureshi (1981)	1950-51-1976-77	Pakistan	Generalised Least Squares (GLS)	Deposit interest rates, call money rate and yield to long run government bonds have positive influence on savings.
Masson, et al. 1995	1950-1990	Industrial and Developing Countries	Co-integration	Inflation, budget deficit, current government expenditure, public investment, GDP growth rate and dependency ratio have positive impact on savings.
Chaudhri & Wilson (2000)	1861–1900: 1949–1990	Australia	VAR Co-integration Test, Granger Causality Techniques	Investment and GDP relationship is relatively complex
Waheed (2004)	1972-2001	Pakistan	Co-integration Techniques.	There exists significant positive long-run relationship between foreign aid and domestic savings of Pakistan.
Husain (1995)	1970-1993	Southeast Asia	Co-integration Approach	The demographics play a vital role in explaining savings behavior and hence supporting the life-cycle hypothesis.
Khan, et al. (1992)	1959-60 to 1987-88	Pakistan	Vector Auto regression model (VAR)	The per capital income, foreign capital inflows, dependency ratio, real interest rate, openness, and term of trade are key factors inducing savings in Pakistan.
Cárdenas & Escobar (1997)	1985–1993	Colombia	Panel Data Estimation	The high government expenditures lead to lower national savings. Whereas increases in urbanization and age dependency ratio are negatively associated with private savings in Colombia.
Shah, et al. (2016)	1981-2010	Pakistan	Auto Regressive Distributed Lag (ARDL) Model	Urbanization, worker's remittances, per capita income, age dependency ratio, inflation rate are significantly affecting the national savings rate of Pakistan.
Fry, 1998	1961-1988	Ten Asian Countries	Simultaneous-equation Model	The empirical results proved that growth (positive), dependency ratio (negative), interest rate (positive) and foreign debt (negative) are all key determinants to affect the savings behavior of Asian countries.
Fry, 1994	1971-91	Malaysia	VAR model	The economic growth has positive effect, while FDI and dependency ratio showed negative impact on domestic savings.

Table 5
Selected Empirical Literature on Investment Behaviour

Authors	Period	Scope	Method	Key Findings
Odey, Effiong, & Nwafor (2017)	1970-2015	Nigeria	Co-integration Analysis and Error correction model	The main determinants of economic growth are fixed investment and gross domestic savings.
Qureshi (1981)	1950-51-1976-77	Pakistan	Generalised Least Squares (GLS)	Deposit interest rates, call money rate and yield to long run government bonds have positive influence on savings.
Chaudhri & Wilson (2000)	1861–1900: 1949–1990	Australia	VAR Co-integration Test, Granger Causality Techniques	Investment and GDP relationship is relatively complex.
Waheed (2004)	1972-2001	Pakistan	Co-integration Techniques.	A significant positive long-run relationship exists between foreign aid and domestic savings of Pakistan.
Geetha & Vimala (2014)	Survey from individual investors towards selected investment avenues	500 Respondents	One sample t-test, Chi-Square	A notable change in the investment opportunities is found to exist due to establishment of different financial institution, attractive rate of return, creditable source, good capital gain, and tax concession.
Gitahi, et al. (2013)	1975-2013	Kenya	Vector Auto regression model (VAR)	Significant positive impact of economic liberalization on private investment and growth in Kenya.
Ozler & Rodrik (1992)	1975-1985	32 Countries	Ordinary Least Square (OLS)	Provision of political rights is conducive for greater private investment behavior. Public investment has both complementary and crowding-out effects on private investment.
Blejer & Khan (1984)	1971–1979	24 Developing Countries	Cross-country Regression Analysis	Availability of credit and macroeconomic policies significantly influence investment behavior.
Jorgenson (1967)	1947–1960	United States	Neoclassical Investment Model	Investment decisions are primarily determined by the user cost of capital and expected output. Lower capital costs stimulate higher investment.

Authors	Period	Scope	Method	Key Findings
Sakr (1993)	1973–1990	Pakistan	Error Correction Model (ECM)	There exists positive relationship between private investment and GDP growth and public investment, while high external debt and macroeconomic instability reduce investment.
Looney (1997)	1973–1995	Pakistan	Econometric Time-Series Analysis	Infrastructure development significantly promotes private investment. Improvements in public infrastructure increase investment activity and economic growth.
Khan (1988)	1972–1987	Pakistan	Ordinary Least Squares (OLS)	Availability of bank credit, economic growth, and favorable macroeconomic policies positively affect private investment, whereas uncertainty and fiscal imbalances discourage investment.
Guimaraes & Unteroster (2006)	1988–2004	Malaysia	Firm-Level and Aggregate Data Analysis	FDI, export alignment, and financial sector development play a significant role in encouraging private investment.
Veemon & Mataya (1996)	1970–1994	Malawi	Simultaneous Equation Model	Public investment crowds in private investment by improving infrastructure and productive capacity. Economic growth and financial development positively affect investment.
Ozler & Rodrik (1992)	1975–1985	32 Developing Countries	Ordinary Least Squares (OLS)	Political stability and stronger institutional quality are conducive to greater private investment and capital formation.
Odey, Effiong, & Nwafor (2017)	1970–2015	Nigeria	Co-integration Analysis and Error Correction Model	Both the gross fixed capital formation as well as domestic savings are key determinants of investment and long term economic growth.

3.3. Synthesis of Literature Review

The empirical literature mentioned in Tables 4 and 5 suggests that both savings and investment are influenced by a combination of macroeconomic, demographic,

financial, and institutional factors. In general, empirical literature on savings found that income growth, real interest rates, financial development, and remittances positively influence savings. On the contrary, inflation, dependency ratios, fiscal deficits, and external debt induce negative impact and reduce savings behaviour (e.g. see Fry, 1995, 1998; Edwards, 1996; Masson, et al. 1995; Nasir, et al. 2004; Husain, 1996; Shah, et al. 2016). Likewise, the empirical literature on investment shows the importance of economic growth, availability of credit, foreign direct investment, financial sector development, political and macroeconomic stability, and public investment in enhancing the capital formation (e.g. see Jorgenson, 1967; Blejer & Khan, 1984; Gitahi, et al. 2013; Looney, 1997). As far as the international evidence is concerned, it broadly supports the positive role of growth and financial development in promoting both savings and investment. Finally, findings on determinants such as interest rates, inflation, remittances, and public debt remain mixed across countries and time periods. Furthermore, the most prominent theories of savings and investment such as the Life-Cycle Hypothesis (Modigliani & Brumberg, 1954) and Permanent Income Hypothesis (Friedman, 1957) emphasised the role of demographics and income expectations in savings decisions e.g. see Edwards (1996), Fry (1995, 1998), Masson, et al. (1995), and Loayza, et al. (2000) indicating the vital role of economic growth, financial development, interest rates, inflation, and dependency ratios. These studies also provide the theoretical and empirical basis for selecting the explanatory variables which are used in the present study.

3.4. Research Gap

Past literature on Pakistan (e.g. Nasir, et al. 2004; Husain, 1996; Waheed, 2004; Jilani, et al. 2013) primarily examined traditional determinants of savings and investment models such as interest rates, inflation, remittances, and demographic factors by using relatively older datasets, usually not capturing major recent economic events e.g. financial deepening, digital financial inclusion, rising FDI volatility, public debt accumulation, and post-2008 structural adjustments. Hence, older studies do not fully capture the evolving macro-financial environment of Pakistan especially over the last decade. This paper is distinct and more relevant for several reasons. First, it uses an updated and extended dataset covering 1981–2023 to capture recent structural breaks and policy shifts. Second, it jointly models both savings and investment functions to check their interdependence. Third, it includes the richer set of explanatory variables i.e. financial development indicators, lending/deposit rate dynamics, remittances behaviour, demographic pressures, FDI inflows, and public debt.

Based on the above-identified research gap, the study makes the following contributions:

1. Updated Evidence: The study provides one of the most recent empirical assessments of savings and investment determinants in Pakistan using annual data covering the period 1981–2023.
2. Integrated Analysis of Savings and Investment: Unlike most previous studies that focus on either savings or investment, the present study examines both national savings and total investment within a unified analytical framework.
3. Identification of Key Determinants: The study systematically evaluates the role of inflation, remittances, dependency ratio, deposit rates, GDP growth, foreign direct investment, lending rates, public debt, and domestic savings in influencing Pakistan's savings and investment performance.

4. Pakistan in Comparative Context: The study complements the econometric analysis with a comparative assessment of Pakistan's savings and investment performance relative to selected Asian economies, highlighting the extent of Pakistan's divergence from high-performing regional peers.
5. Use of advanced time series techniques: The study has used advanced time-series techniques, including stationarity testing (KPSS) and structural break modelling (SIS and IIS), thus improving the robustness of results compared to earlier studies that largely relied on basic OLS. The use of this methodological advancement ensures more reliable policy implications in the presence of structural changes in Pakistan's economy.

4. DATA AND METHODOLOGY

This study is based on secondary annual data ranging from 1981 to 2023. For analysis, the data have been taken from Economic Survey of Pakistan (various issues), World Economic Outlook Database, World Bank and State Bank of Pakistan economic databases. Based on some of the empirical studies as mentioned in Section 3, the following saving and investment models have been developed in given Equation 1 and Equation 2.

Savings Model

$$NS = a + f RMT + g INF + i AD + j DIR + b GDPG + \varepsilon_i \dots \dots \dots (1)$$

Where,

NS = National Savings (as % of GDP)
 RMT = Personal Remittances, Received (as % of GDP)
 INF = Inflation, Consumer Prices (annual %)
 AD = Age Dependency Ratio (as % of working-age population)
 DIR = Weighted Average Rate of Return on Deposits
 GDPG = GDP Growth Rate (annual %)
 ε_i = Error Term

Investment Model

$$TI = a + b DS + c LIR + d FDI + e PD + f GDP + \varepsilon_i \dots \dots \dots (2)$$

Where,

TI = Total Investment (as % of GDP)
 DS = Domestic Savings (as % of GDP)
 LIR = Weighted Average Rate of Return on Lending
 FDI = Foreign Direct Investment, Net Inflows (as % of GDP)
 PD = Log of Public Debt
 GDP = Log of GDP
 ε_i = Error Term

For empirical analysis, the Ordinary Least Squares (OLS) method has been adopted to obtain the inferences from the models specified in Equation. 1 & 2. To make data consistent with time series properties and to remove the trend problem in the series, most of the variables are used as percentage of GDP. The stationarity of the variables has

been checked through KPSS test. Finally, differences in base years of some variables have been corrected.

4.1. OLS Estimation: Theoretical and Empirical Rationale

Based on both theoretical and empirical considerations the OLS is selected for estimation. The primary objective of the study is to identify the determinants of both savings and investments in Pakistan instead of estimating long-run co-integration relationships. Moreover, the selected variables of both models found to be stationary based on KPSS unit roots tests 6, in such a scenario OLS provides both consistent and unbiased parameter estimates under the assumptions of classical linear regression.

Furthermore, in the previously available literature, OLS is one of the most widely used estimation techniques in the savings and investment (e.g. see Nasir et al. (2004), Mualley (2011); Ozler and Rodrik (1992), also numerous cross-country analyses, have employed OLS to inspect the determinants of savings and investment. Therefore, the use of OLS estimation technique in this paper provides comparability of results with the existing literature.

Finally, given the relatively small sample size (1981–2023 with 43 annual observations), OLS provides a parsimonious and efficient estimation framework. The advanced techniques such as ARDL, VECM, or GMM are usually more appropriate when the underlying objective is to investigate dynamic relationships, co-integration, endogeneity, or causal mechanisms. Since the main focus of the present study is on identifying the major correlates of savings and investment models in Pakistan, OLS is revealed an appropriate first-order estimation strategy.

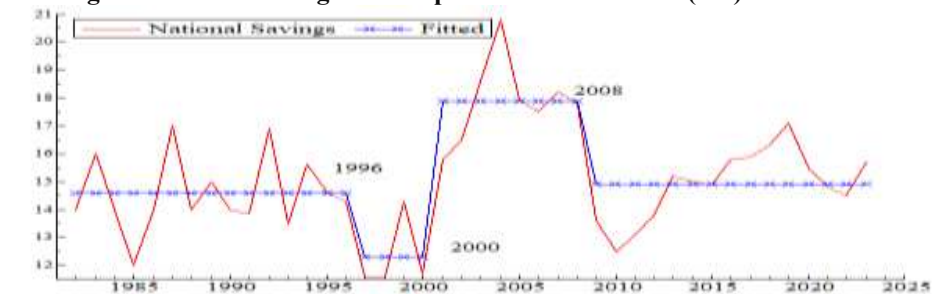
5. RESULTS AND DISCUSSION

The empirical results obtained from Equation 1 and Equation 2 are described below separately for savings and investment functions.

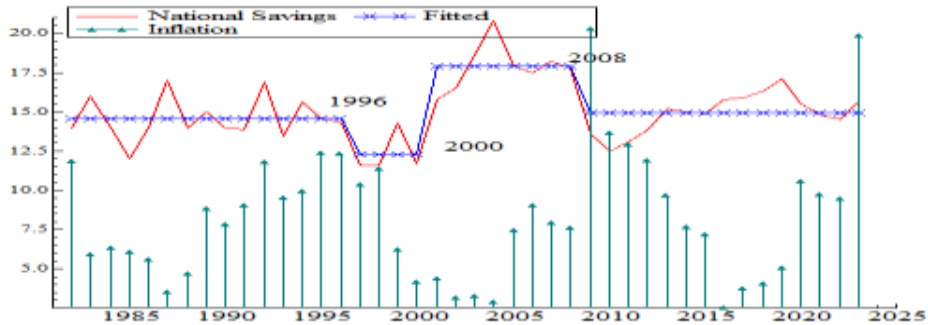
5.1. National Savings Function

National Savings is an important macro-variable subject to policy intervention. To identify significant policy change over the data span, Step-Indicator Saturations (SIS) and Impulse-Indicator Saturations (IIS) are employed. Hence, the following result traces three 1996, 2000 and 2008 significant step-interventions which prevail for some time period, see figure 5.1. Amongst many reasons, one could be the inflation, during the periods of stable prices the savings are higher and vice versa, see Figure.5.2.

Fig. 5.1. National Savings with Step-Indicator Saturation (SIS) Interventions



⁶ KPSS stationarity tests confirmed that the variables are integrated of order zero, thereby reducing the risk of spurious regression.

Fig. 5.2. National Savings and Inflation Trends

Non-stationary time series may cause spurious regression. All the series are tested for possible unit roots. Consequent upon critique on ADF test, KPSS (1992) test has been applied to explore any unit root in the time series data. The following results confirm stationarity of given time series; however, with small data sets the results should be treated cautiously.

Series at Level	KPSS Statistics	Conclusion
National Savings	0.157925	I (0)
Inflation	0.0820255	I (0)
GDP Growth	0.0776436	I (0)
Deposit Interest Rate	0.584058	I (0) ***
Remittances	0.349302	I (0)
#Per Capita Income (log transformed)	0.0583803	I (0)
#Age Dependency Ratio (4 Lags)	0.186244	I (0) ***

KPSS H₀: Series is I(0); CV without trend (1%, 5%, 10%)=(0.739***, 0.463**, 0.347*) #CV with trend (1%, 5%, 10%)=(0.216***, 0.146**, 0.119*)

With stationary time series data and information about significant interventions, an ANCOVA (Analysis of Covariance) model has been estimated to get the possible determinants of national savings. Following Hendry's general-to-specific modeling Table 6 concludes the following parsimonious model.

Table 6
Results for Savings Function

Variables	Coefficient	SE	P-Values
Remittances	-0.584980	0.1824	0.0029
Inflation	-0.220209	0.07398	0.0053
Age Dependency Ratio	-0.471298	0.1105	0.0002
Deposit Interest Rate	-0.275976	0.1447	0.0650
GDP Growth Rate	0.125810	0.06867	0.0757
Constant	54.7568	8.786	0.0000

no. of observations = 42

no. of parameters = 8

R² = 0.678675 Adj.R² = 0.61252

Overall F test (7,34) = 10.26 [0.000] **

*Normality test Chi-Squared (2) = 3.8900 [0.1430; Hetro test: F (12,29) = 1.0156 [0.4606]; Hetro-X test: F (22,19) = 1.1585 [0.3758]

RESET23 test: F(2,36) = 1.0533e-028 [1.0000]

I: 1996, I: 2000 and I: 2008 are significant outliers.

*Normality Test H₀: Residuals are normally distributed, Hetro tests H₀: Residuals are Homoscedastic.

The coefficient of determination R^2 is high and all variables have significant impact on the national savings as shown in Table 6. In both Tables 3 and 4 a number of diagnostic tests were used to assess the normality, heteroscedasticity and functional form of the models.

Table 6 shows significant negative impact of inflation on national savings which is in line with literature (e.g. see Ipumbu and Kadhikwa, 1999) and the possible reason behind it is the increased uncertainty (i.e. higher expected future inflation rate motivate people to substitute future consumption with present consumption thus their savings rates decline).

The empirical evidence detects an inverse relationship of dependency burden⁷ (i.e. young age: 0-14 years and old age dependency: 65 years plus) on the national savings rate in Pakistan and the coefficient is somewhat large (i.e. 0.47). The increase in the dependent population would increase consumption expenditures which leads to a fall in savings as discussed in Gupta (1971), Ahmad (2002); Poliner (2005) etc. However, in a study (Ali, et al. 1997) the negative impact of age dependency ratio originates only from the young-age bracket while this impact is positive for the old-age cohort. The reasons for the positive impact of old age dependency ratio on savings could be noticeable fall in the marginal propensity to consume (MPC) after getting retirement, reinvestment of past income and bequests in order to produce more income, self-employment, continuing private jobs etc.

As shown in Table 6, DIR⁸ shows substantial negative impact on national savings which is contrary to Mikesell & Zinser (1973) and Ali, et al. (1997). The possible reason behind the inverse relationship might be the continuous increase of domestic consumption of Pakistani households which make them unable to raise their household savings despite the increase in deposit interest rates. Therefore, in case of Pakistan it can be said that the prevailing low deposit rates create disincentive to save and results in the frequent withdrawal of funds from banking sector or in other words there exists insensitivity of households towards high deposit rates. The findings are consistent with those of Nonvide & Amegnaglo (2017) and Miftahu (2019).

Remittances exhibit a significant negative relationship because in case of Pakistan remittances are hardly used for productive investments, mainly due to the fact that recipients of remittances have consumption oriented habits in Pakistan see Barua, et al. (2007).

Finally, as per permanent income hypothesis and Keynesian approach, the savings rate is positively associated with national income (GDP) and this is because more surplus in income means higher savings rate, for this reason GDP is used as growth rate variable in the savings function of current study which turns out having significant and positive impact on national savings as shown in Table 6. Similar finding has been observed in the studies such as Bosworth (1993); Deaton (1995); Charles & Wang (2007).

5.2. Total Investment Function

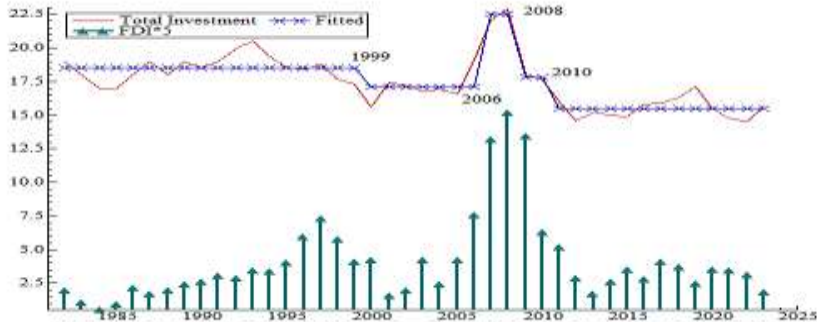
Total investment, another important macro-variable (comprised on both public and private investment) plays a critical role to boost economic growth of a country. In order to trace policy impacts on total investment trend Step-Indicator-Saturations (SIS) and Impulse-Indicator-Saturations (IIS) are employed. Hence, the result traces four 1999, 2006, 2008 and 2010 significant step-interventions which prevail for some time see figure

⁷ This segment of the population is dependent on earning segment of the population.

⁸ A higher deposit rate leads to higher savings by individuals.

5.3. Amongst many reasons, one could be the foreign direct investment, during the periods of higher FDI inflow the total investment is higher and vice versa, see Figure 5.3.

Fig. 5.3. Total Investment and FDI Trends with SIS/IIS Interventions



In the current study the data series is checked for unit root issues. Since time series data are vulnerable to these issues, ensuring a consistent and useful time series estimation is important. Therefore, the KPSS test has been used to check the order of integration of the variables.

Series at level	KPSS statistics	Conclusion
Domestic Savings	0.224877	I(0)
Lending Interest Rate	0.149344	I(0)
Foreign Direct Investment	0.244782	I(0)
Public Debt (log transformed)	0.12972	I(0)
GDP (log transformed)	0.126667	I(0)
Total Investment (4 lags)	0.461466	I(0)

KPSS H_0 : Series is I(0); CV without trend (1 Percent ,5 Percent ,10 Percent)=(0.739***, 0.463**, 0.347*)
 #CV with trend (1 Percent ,5 Percent ,10 Percent)=(0.216***, 0.146**, 0.119*)

All variables of Equation.2 are checked for unit root issues to ensure reliable and useful time series evaluation. With stationary time series data and information about significant interventions, an ANCOVA (Analysis of Covariance) model has been estimated to develop given Table 7.

Table 7
Results for Investment Function

Variables	Coefficient	SE	P-Values
Domestic Savings	-0.149916	0.03931	0.0006
Lending Interest Rate	-0.0336361	0.06992	0.6335
Foreign Direct Investment	1.21121	0.3489	0.0014
Log of Public Debt	-0.949634	1.605	0.5580
Log of GDP	0.720193	1.934	0.7120
Constant	13.3626	18	0.4628

no. of observations = 42

no. of parameters = 8

$R^2 = 0.84974$ Adj. $R^2 = 0.818804$

Overall F test (2,32) = 0.22078 [0.8031]

*Normality test Chi-Squared (2) = 2.6443 [0.2666]; Hetero test: F (12,29) = 0.61598 [0.8112]; Hetero-X test: F (22,19) = 0.95972 [0.5409]

RESET23 test: F(2,32) = 0.36262 [0.6987]

I:2006 and I:2008 are only significant outliers.

*Normality Test H0: Residuals are normally distributed, Hetero tests H0: Residuals are Homoscedastic.

The lending interest rate (i.e. cost of financing) is the main channel through which savings are transformed into investments. As shown in Table 7 it is negatively associated with total investment for the case of Pakistan. A unit increase in lending interest rate while other things remaining equal, triggered a decrease of 0.03 units in total investment. This shows that the availability of financial services (especially a favorable lending interest rate) is a critical component for encouraging total investment in the economy. On the other side, as mentioned earlier that low deposit rates create disincentive to save and thus decreases the readiness of bank credits which also reduces investment, for details see McKinnon (1973).

FDI has significantly positive impact on total investment in case of Pakistan as shown in Table 7. In fact, for developing countries FDI is considered as an important source of capital accumulation, technological knowledge, employment creation, growing tax incomes, stimulating trade opportunities, improving management and labor skills in host countries (Chinasa, et al. 2022 and Nielsen & Lofgren, 2003). These might assist developing countries in rising their investment levels.

The coefficient of public debt is negative as seen in results of the regression. In Pakistan government finances its fiscal deficit via domestic and external borrowing by bearing higher borrowing costs, thereby it has fewer funds to spend and consequently consistently higher public debt of the country has become a source of reduction in its total investment. Similar findings are reported in Paiko (2012). Moreover, it has been found that at disaggregated level of total investment, the results might be more interesting e.g. in Nigeria, the impact of external debts on all types of investment is greater than domestic debts, see Ogunjimi (2019).

Domestic savings are negatively correlated with the dependent variable and it has significant impact. Theoretically, the availability of higher funds (i.e. higher domestic savings) should increase total investment of the country, but in case of Pakistan a big proportion of domestic savings is utilized by government to finance its deficit, thereby discouraging private investment which is a vital component of total investment. Finally, the effect of GDP is found to be positive but statistically insignificant.

6. CONCLUSION

The savings and investment rates in Pakistan remained low during the last six decades which caused sluggish economic growth in the country. When compared with selected Asian countries, it has been found that Pakistan stands below in savings and investment rates among all those countries. In order to follow the model of sustained economic growth of these countries, Pakistan has to increase its total investment through its increased national savings. However, the savings and investment in the economy should increase through operational policies by giving due consideration to the potential determinates of both investment and savings. As discussed in the current study the savings

in Pakistan are significantly affected by inflation, remittances, GDP, deposit rates and age dependency ratio. On the other hand, the FDI is the significant determinant of total investment.

The policies that encourage foreign investment in Pakistan and appropriate interest rates might rise savings and consequently investment in Pakistan.

This study is a brief overview of some major determinants of savings and investment in Pakistan, there is a dire need to look further to incorporate more relevant determinants over a longer span of data and using more appropriate estimation techniques after checking causality of the variables in order to make any rational decision.

7. POLICY IMPLICATIONS

As discussed above the experience of high-performing Asian economies underscores the fact that to achieve long run economic stability, sustained increases in domestic savings and investment are fundamental prerequisites. Therefore, policymakers should adopt an integrated strategy that promotes savings mobilization to attract productive investment. Following are the main policy implications derived from this study.

1. The significant negative impact of inflation on savings indicates persistent inflation discourages savings and long term financial planning. Hence, cautious monetary and fiscal policies should be aimed to control inflation in order to strengthen domestic savings levels.
2. The significant age dependency ratio shows that growing dependent population exerts pressure on household resources and thus reducing savings capacity, therefore, policies that could enhance skill development and employment opportunities can improve national savings performance.
3. A large portion of remittances is used in consumption rather than productive investment, therefore there is a need to introduce targeted financial instruments into productive sectors such as SMEs, technology and infrastructure.
4. The positive role of GDP to enhance savings highlights the importance of growth enhancing policies. Hence, improving productivity via exports, competitiveness and innovation can generate higher incomes which ultimately increase country's savings potential.
5. Finally, the significant positive impact of FDI on total investment shows that attracting FDI is crucial for Pakistan and this requires improved ease of doing business and investment friendly regulations.

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