International Journal of Business and Management Sciences **E ISSN**: 2708 – 4337 **P ISSN:** 2708 – 4329
Available online at http://www.ijbmsarchive.com
International Journal of Business and Management Sciences
Volume 06 (01), 2025
Received, 17 November, 2024, Accepted, 01 March, 2025, Online, 3 March, 2025

The Dynamic Relationship of Capital Formation and Economic Growth in Pakistan

[1] *Dr. Bashir Ahmad,* [2]*Muhammad Wasim Uddin,* [3]*Dr. Altaf Hussain,* [4]*Dr. Nargis Bibi,* [5]*Dr. Taimoor Khan Akhunzada*

Keywords:
Investment, capital Capacity, Economic development and Growth, Public Savings, International Investment and Long-Term Capital Movements, Money and Interest Rates.

ABSTRACT

This article investigate the dynamic link between 'capital formation' and 'economic growth' in Pakistan during the period 1972 to 2020. Using the econometric techniques—unit root tests, Johansen co-integration techniques, t-bound and f-bound tests, and vector error correction models (VECM) both short and long-run interactions between them are examined. Granger causality is used to examine causal relationships between government expenditure (GE) and GDP, GFCF and discount rate (DR), Foreign direct investment (FDI), and gross national saving (GNS) and FDI. The unit root tests guarantee the stationarity of the data while co-integration analysis and the f-bound and t-bound tests reveal the existence of both short-run and long run equilibrium links between "Capital Formation" and "Economic Growth".

The results reveal that, over the long run, capital accumulation and economic growth are mutually reinforcing under specific causal routes leading to significant areas for policy action. The study underlines the need of putting strategic policies into action to raise the GDP-to---savings ratio, therefore increasing strong capacity for capital formation and investment capabilities. The study provides policy insight to boost economic stability and growth by means of targeted financial and investment strategies with analytical examination of how capital formation influences economic development.

INTRODUCTION

The economic growth of countries, both in developed and developing countries depends much on the production of capital. It affects general prosperity, job growth, and economic efficiency directly. Countries can increase marginal returns and stimulate economic growth by focusing extra funds into industries with historically low initial capital stocks (Adhikary, 2015). Along with promoting economic growth, this procedure improves employment possibilities and raises living standards by means of which Alam & Bhowmik, 2020 drive.

[1] *Assistant Professor, Department of Economics, ICP. Email: b.ahmad3@icp.edu.pk*
[2] *M.Phil Scholar, Department of Economics, Islamia College Peshawar. Email*: waseem618gcu@gmail.com
[3] *Assistant Professor, Department of Economics, ICP. Email: altaf@icp.edu.pk (Corresponding Author)*
[4] *Assistant Professor, Jinnah College for Women, University of Peshawar. Email: nargisikram@uop.edu.pk*
[5]*Visiting lecture, Development studies department, University of Peshawar Email: taimoorakhunzada@gmail.com*

Defined as the rise in the capital stock within an economy, capital formation captures the real degree of investment and its consequent effects on productivity and possible production. The Neo-classical growth model holds that when extra capital is spent in profitable industries, smaller initial capital stock developing nations achieve greater marginal returns and growth rates. Therefore, everyone agrees that one of the main forces behind economic development is capital creation (Alam & Bhowmik, 2020.). Capital building is an essential policy instrument for developing countries in affecting actual economic factors and promoting sustainable development (Mishra, 2010).

There are three separate phases of capital formation: investment, savings mobilization, and generation of savings. This process is fundamentally based on savings since the Harrod-Domar model shows that the rates of capital creation and saving of a nation directly determine its economic growth pace. Rising GDP growth results from higher savings and investments. Promoting savings, building a favorable investment environment, and investing in infrastructure are three essential policies for developing nations hoping to sustain economic growth and increase capital creation (Shuaib & Ndidi, 2015). Large-scale initiatives like infrastructure development and healthcare investments in particular help to increase commerce and economic activity.

Extensive research has examined the relationship between capital development and economic growth with significant contributions from Hirschman, Lewis, Myrdal, Nurkse, Rosenstein-Rodan, Sevtorsky, and Streeten (Kingsley & Lucky, 2016).

Various strategies for economic development call for rigorous study and use since each has both short- and long-term effects. There is clear evidence of the close relationship between capital creation and economic development; effective capital creation depends on investment. Often expressed as real GDP rises, economic growth entails changes in economic institutions, new economic activity, and productivity gains. Models such Romer, Solow, and Harrod-Domar offer structures for grasping and encouraging this development. This process depends much on capital, which is defined as created products or services employed in more production. Emphasizing the need of moving savings from current consumption to productive uses, Professor Colin Clark defines capital formation as the net addition to the present capital stock within a given period (Ajose et al., 2018).

Economic development depends on efficient capital formation, different from non-productive savings like gold hoarding. It greatly influences expenditures in social and physical

infrastructure as well (Ajose et al., 2018). Most analysts concur that a major factor influencing economic development is capital generation. By fully using the resources at hand, Professor Nurkse said it can stop the vicious cycle of poverty in developing nations. Improved capital creation results in higher economic growth, which in turn increases employment, income, and production while balancing payments and inflation difficulties. While inflation has a temporary negative impact, factors such trade openness, exchange rates, and total factor productivity help to positively affect economic growth. Improving saving ratios, banking institutions, and infrastructure will help to increase capital formation (Ajose et al., 2018). Therefore, governments of underdeveloped nations are urged to concentrate on boosting capital creation in order to reach better degrees of economic growth (Prasad Bal et al., 2016).

To sum up, the link between capital creation and economic development is rather significant and complex. Effective capital production determines whether one can attach steady economic development, increase productivity, and raise living standards. Knowing and applying this link will enable legislators to design strategies encouraging economic growth in various surroundings. Historically, especially in undeveloped countries, capital generation is considered as pillar of economic development.

For nations like Pakistan that are still growing, the situation is much more complicated. Although physical capital investment is still vital, a wider range of elements now determines economic development more and more. These cover non-material inputs like institutional development, health, and education. According to Ahron Wiener, growth in developing nations results from the combination of non-investment elements pertaining to human resources and institutional quality with investment elements (Wiener, 1979).

Therefore, this study seeks to offer a sophisticated knowledge of how other elements together influence economic development in Pakistan together with capital accumulation. By attending to these aspects, we may create more all-encompassing plans to improve economic growth.

Examining both short-term and long-term consequences, this paper investigates the favorable dynamic interaction between capital development and economic growth in Pakistan. The study emphasizes the need of capital creation for the direction of national development by stressing its vital part in promoting economic progress. It seeks to answer the following research question: Over the short and long terms, what is the dynamic interaction between capital creation and economic growth in Pakistan? The results should inspire investment plans based on capital building and provide practical information for legislators to handle current issues in

this field. Furthermore, the study will offer strategic directions for creating successful strategies to use capital creation to improve the general state of national economy. Moreover, the study hopes to motivate next generations of researchers to actively support, both in the near and long terms, in the field of capital creation and economic development.

Examining both short-term and long-term, the aim is to clarify the link between stock market capitalization-based capital creation and economic growth in Pakistan. According to the theory underlining this research, Pakistan's economic growth is positively correlated with stock market capitalization-based capital creation.

Capital Formation and Economic Growth

Kesar, A. et al. (2022), investigated the relationship of governance index and fixed capital formation on the economic wellbeing of (BRICS) using yearly data for the period 2002- 2019. This study used Fixed Effect Model, Driscoll and Kraay standard error with fixed effect, Fully Modified Ordinary Least Square (FMOLS), Dynamic Ordinary Least Square (DOLS) and Panel Dumitrescu Hurlin Causality test for empirical analysis. The findings of the study shows that the variables like governance index, fixed capital formation, population rate, control of corruption, and effective governance have a significant and positive impact on economic growth of (OECD) countries, while regulatory quality shows a negative and significant impact on economic growth.

Amjed, and shah, (2020), Investigates long and short-run relationships between the financial system development, trade diversification, formation of capital and economic growth of Oman. ARDL estimation technique is used to investigate long and short-run relationships among the capital formation, financial development, economic growth and trade diversification for the period starting from 1979 to 2017.The findings of the study show that the financial system development and economic growth has a significant positive impact on trade diversification in the short and long-run. However, capital formation has a negatively impact on trade diversification in the short and long run. The negative relationship between diversification of trade and formation of capital is because, during study period, the investment in capital goods was organized to enhance the production capacity and advancement of the oil sector to maximize revenue.

Bhmowik, D. and Alam, M. (2020), investigated the relationship between imports, exports, capital formation and economic growth for Bangladesh. They used time series data for the period starting from 1972-2018. The study used Johnson co-integration test, vector error

correction model and granger causality test for empirical analysis. The result shows that there exist a long run and statistically significant relationship between capital formation, import, export and economic growth. The study also shows short run causality running from export to economic growth, import to economic growth and formation of capital to economic growth.

Babatope, M. and Ogunniyi (2018) investigated impact of human capital formation on economic wellbeing in Nigeria implying bound testing method for the period starting from 1984- 2014. ARDL BOUND testing approach is used to examine the short run and long run relationship between economic wellbeing and human capital formation in Nigeria. The result of empirical study finds that there is a long run relationship between human capital formation and economic growth in Nigeria.

Yasmin, T. Bekhet, H. (2017), investigated the Dynamic relationship among financial development, economic growth, energy consumption, CO2 emissions and fixed capital formation in Malaysia. They used Time series data for the period starting from 1970- 2013 for empirical analysis. ARDL and multivariate Ganger causality tests are used to find the dynamic interrelationship between variables. The result of the study shows that there exists a short and long run significant relationship and long run unidirectional Ganger causality among the variables.

Ogunsola, A. and Adeyemi, P. (2019) examined the impact of human capital development on economic development in Nigeria by using ARDL co integration approach for numerical analysis for the period 1980-2013. The finding of the study shows that there is a positive long run relationship between secondary school enrolments; expenditure on education, life expectancy rate, gross capital formation and economic growth but the result is statistically insignificant. The finding of the study also revealed that there exists negative long run relationship among primary, tertiary school enrolment, expenditure on health with economic growth.

Elfaki, K. and Anwar, N. (2021), Examined the Relationship between Energy Consumption, Economic Growth and Environmental Degradation in Indonesia for the period 1965- 2018 by including gross capital formation and openness of trade as relevant factors. Auto regressive distributive lag model, modified ordinary least squares test, dynamic ordinary least square test and canonical co integration regression test has been used for empirical analysis between variables. The result reveals the existence of co integration relationship among variables. The empirical result also indicates that in the long term the gross fixed capital formation is

negatively associated with environmental disaster. It result shows that gross fixed capital formation plays a key role in diminishing environmental degradation in Indonesia.

Yasmin, H., et al (2021), examined the association between natural resources, energy consumption and Gross capital formation with economic development in Pakistan for the period 1990-2018. The study employed structural equation modeling method for empirical analysis. The result of empirical analysis indicates that there exists an insignificant and negative relationship of natural gas with economic growth. It conform the availability of resource curse hypothesis. The result also indicates the impact of gross capital formation on economic growth were insignificant.

Liaqat, Z. (2019), investigated the impact of government debt crowd out on capital formation for 127 countries for the time period of 1980 to 2017. Panel VAR is used for empirical analysis. The result of the study indicates the crowding out effect of government debt on the subsequent drop in output growth. The impact of capital formation to the shock in debt appears to be consistent in different income categories of countries, and does not depend upon the size of debt-to-GDP ratio.

Ghosh, S. (2019), examined the impact of capital formation, Foreign Direct Investment, Female Education on economic Growth of Japan during the period 1971- 2014. Auto regressive distributed lag (ARDL) bound approach is used to examine the long run causal relationship among variables. The result of empirical analysis shows that there exists a positive relationship of capital formation, foreign direct investment and female education with economic wellbeing of Japan.

Khan and Uzma (2020) investigated the relationship between urbanization, gross capital formation and economic growth in Saudi Arabia for the time period started from 1974-2018. Basic statistic test and correlation matrix were used to check the casual effect among the variables. Vector auto correlation model (VACM) is used to investigate the short and long run relationship among the variables used in the study. The findings of granger causality test shows that there exists uni-directional casual relationship between capital formation and economic growth.

Shuaib, M. and Ndidi, D. (2015), investigated the capital formation impact on economic development of Nigeria for the time period starting from 1960 - 2013. The study used Harrod Domar model to check the Nigerian economic development model. It is tested that whether it has a significant relationship with the economy of Nigeria. The empirical result revealed that

there exist a strong and significant relationship between capital formation and economic growth in Nigeria.

Stuonikova, E. and Sukhadolets, T. (2019), investigated the inter relation between the growth of gross fixed capital formation, volume of construction industry and the amount of investment in Russian federation for the period starting from 2000 to 2013. Regression analysis and auto regressive distributed lagged bound technique were applied to find the co integration and impact of construction industry volume on gross fixed capital formation. The result of the empirical analysis shows a nonlinear causation between construction industry volume and the growth in gross fixed capital formation in the end period.

Pasara, M. and Garidzirai, R. (2020), Investigated the Causality Effect among Gross Capital Formation, Unemployment and Economic Growth in South Africa for the period between 1980 to 2018 by using vector auto regressive (VAR) model. The result of empirical results shows that there is a positive long run relationship between capital formation and economic growth. The empirical finding also shows a significant and positive relationship between unemployment and gross capital formation.

Feddersen Maura et al, (2017), conducted research on net exports, capital formation and economic growth rate in South Africa. He applied Johansen co integration test, impulse response function, and variance decomposition technique and ganger causality test to investigate the impact of export growth and total capital formation on economic growth. Time series data is used for empirical analysis. The findings of the study showed that net export growth directly increase economic growth in short run period. The long-term effect among the variables was found to lie in supporting faster capital formation and as a result significantly increase economic growth.

Shah et. al, (2020), analyzed the relationship among capital formation, economic growth, export and import in case of Pakistan. For the analysis Time series data for the period 1976 to 2015 is used. Augmented dickey fuller test, Johanson co intigration test, vectr error correction model and ganger causality techniques are used to find the relationship among variables. The result shows that gross fixed capital formation, import, export and real GDP have a long run relationship and are co integrated. The result of the study reveals in the long run physical capital formation has no impression over gross domestic product (GDP).

Gaps in Literature

Research on the connection between human capital development and economic growth has been somewhat extensive throughout many countries. Still, the link between physical capital development and economic growth is not obvious, particularly in respect to developing countries like Pakistan.

Few studies to date have looked at Pakistan's dynamic connection from both short-term and long-term perspectives between capital development and economic growth. The worth noting articles in this regard are by Shah et al. (2020) and Ali (2015), but their investigation is limited to either short run or long run only. Moreover, in these studies, much attention is paid to the more conventional proxy's foreign direct investment (FDI), unlike the present study.

Diverse capital creation mechanisms inside a nation depend much on stock market capitalization (SMC) (Ugochukwu et al., 2013). Nonetheless, the literature shows a clear discrepancy over research including SMC as a factor influencing capital creation and examining its effects on Pakistani economic growth. This gap emphasizes the importance of research using SMC as a variable in the capital building process and investigates its relationship with economic development from both a short-term and long-term viewpoint.

METHODOLOGY

Theoretical Framework

According to development economists, capital formation is the foundational cause and fundamental key of economic growth of an economy in the end. It plays a vital role for the economic wellbeing of less developed countries, (Akindele et al 2010). The capital formation process in an economy leads to increase national output level and it also helps in fulfilling the requirements of population growth in such economies. Classical economists maintained that capital accumulation as the main driver of economic development and a key to progress. Therefore, all classists lay emphasis on larger savings. According to classical economists only capitalist are able to save and working class could not save because their wage is equal to subsistence level. The classical economists also emphasize on stationary state in their theories. According to them stationary state of an economy is the end of the process of accumulation of capital and economic growth.

The Capital to labor ratio has long been under discussion for under developed countries. It has been argued that the prosperity of a country having large population critically depends upon

the pace of capital formation, (Akindele et al 2010). In a country with large population required high capital availability for high labor productivity.

Capital formation is indirectly related with the rate of interest. The higher the rate of interest the higher will be the willingness to save. It increases saving rate of a country and saving rate boosts investment. The increase in investment plays a pivotal role in capital formation. Secondly, political stability of a county paves the roads towards capital formation by increasing the opportunity to save and lastly stock market capitalization boosts investment with in a country, which is pre requisite for capital formation.

Logical and Conceptual Framework

According to Harrod Domar growth model new investment which represents the new addition to capital stock is necessary for growth. This model emphasizes that there is direct relationship between gross national product and total capital stock. The fundamental assumption of Harrod Domar growth model is that the national income is proportional to the level of capital that is:

$$Y = \delta K \quad (1)$$

Y = Level of national income

K = The capital stock amount employed in production of national income

δ = Shows the output-capital ratio

The above model is relies on the fact that in order for growth, new investments in an economy representing net addition to the stock of capital are necessary. The model assumed that there exists direct relationship between the total capital stock level and national income. By dividing both sides by k we get:

$$\delta Y/K \quad (2)$$

Equation 2 shows growth level of income must be proportional to the growth of the physical capital stock employed.

$$\Delta Y = \delta \Delta \quad (3)$$

Initially if the stock of capital is fully employed then the growth of annual income will be limited by the annual growth level of capital stock. The annual total change in the physical capital stock is to be net physical level of investment. By substituting (I) from (ΔK) in eq. 3 we get, ΔY= δ I. It has supposed that the economy of a country saves a constant proportion (S) of the total income every year, because desired level of saving should be equal to the desired level of investment.

$$S = I * S_y \quad (4)$$

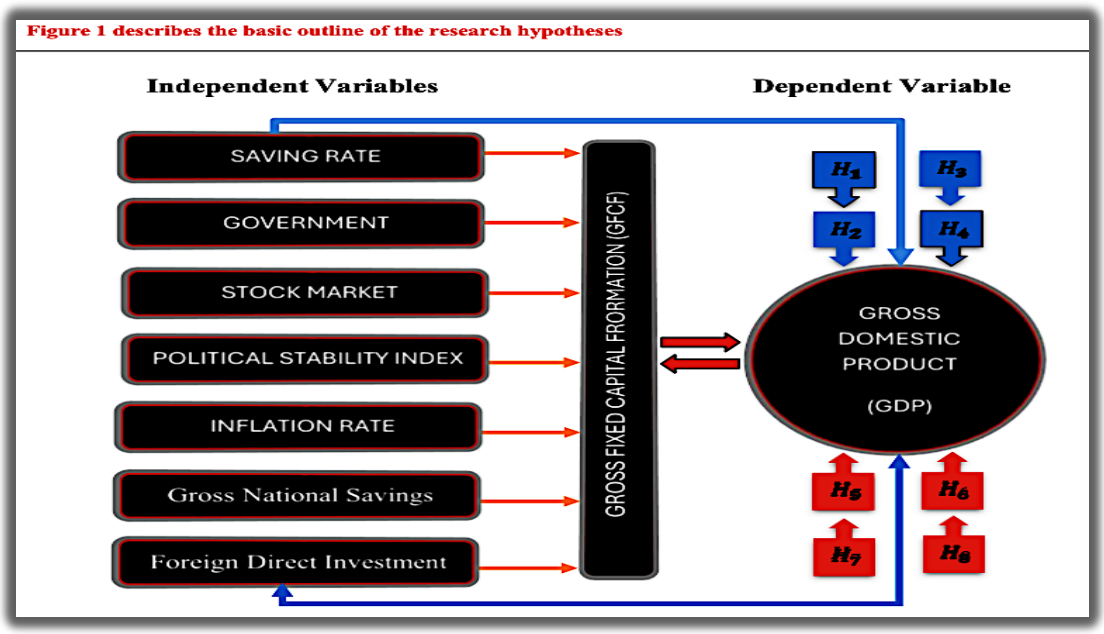
Where S represents is the marginal propensity to save. Substituting (S_y) for (I) in eq. 1 and divide both side by (Y) we get:

$$\Delta Y/Y = \delta S \quad (5)$$

The ratio of ΔY/Y is the annual growth in income at which the stock of capital is fully employed. At this level of growth rate, the expectation of growth will be realized. Such type of growth rate is also known as warranted rate of growth as Harrod expressed it. The economic theory growth simply states that the growth rate of nation income level is jointly determined by the national saving ratio and national capital/output ratio.

Outline Of Research Hypothesis - Conceptual framework

This research is concerned mainly with the relationship of formation of capital and economic growth in Pakistan for the period 1972 to 2020. To achieve the main objective of the study Johanson co integration test is employed to find the long run relationship between the variables while granger causality test is used to find the short run relationship between variables.



Model specification

$$lnYt = \propto_0 + \propto_1 lnY_{t-1} + \propto_2 lnCF_t + \propto_3 lnGNS_t + \propto_4 lnFDI_t + \propto_5 lnGTE_t + \propto_6 lnINFC_t + \propto_7 lnSMC_t + \propto_8 lnDR_t + \propto_9 lnPSP_t + \in_t$$

In the model described, the subscript (t = 1,…,T) represents the time period. The dependent variable, Y, denotes Gross Domestic Product (GDP). The model allows capital formation to be determined endogenously by several factors: Gross National Savings (GNS), Foreign Direct

Investment (FDI), and variables that influence knowledge spillovers and technology transfer. It also covers Government Spending (GTE), Gross Fixed Capital Formation (GFCF), Inflation Rate (INFC), Stock Market Capitalization (SMC)—used as a proxy for financial well-being—Discount Rate (DR), and Political Stability Index (PSP), therefore influencing the prospects for savings. $\in_t$ denotes the error term. The model combines these elements to describe how different economic factors affect capital creation, therefore allowing an empirical analysis of the link between economic growth and capital creation.

$$\boldsymbol{lnCFt} = \propto_0 + \propto_1 \boldsymbol{lnCF_{t-1}} + \propto_2 \boldsymbol{lnY_t} + \propto_3 \boldsymbol{lnGNS_t} + \propto_4 \boldsymbol{lnFDI_t} + \propto_5 \boldsymbol{lnGTE_t} + \propto_6 \boldsymbol{lnINFC_t} + \propto_7 \boldsymbol{lnSMC_t} + \propto_8 \boldsymbol{lnDR_t} + \propto_9 \boldsymbol{lnPSP_t} + \in_t$$

The equation given shows the factors influencing per capita economic growth and the link between capital formation and economic growth. We incorporate $ln\ CF_{t-1}$, which denotes the lagged value of capital creation, in this framework to show how previous capital creation shapes present economic growth. Both models will be first dynamically estimated in order to grasp their separate influences. The models will then be examined concurrently in order to investigate the bidirectional relationship between capital production and economic growth. This method finds the intricate causal links and interactions between capital creation and economic growth by means of a Simultaneous Equation Model (SEM). Examining such complex cause- and- effect dynamics calls especially for SEM.

$$\boldsymbol{lnYt} = \propto_0 + \propto_1 \boldsymbol{lnY_{t-1}} + \propto_2 \boldsymbol{lnCF_t} + \propto_3 \boldsymbol{lnGNS_t} + \propto_4 \boldsymbol{lnFDI_t} + \propto_5 \boldsymbol{lnGTE_t} + \propto_6 \boldsymbol{lnINFC_t} + \propto_7 \boldsymbol{lnSMC_t} + \propto_8 \boldsymbol{lnDR_t} + \propto_9 \boldsymbol{lnPSP_t} + \in_t$$

$$\boldsymbol{lnCFt} = \propto_0 + \propto_1 \boldsymbol{lnCF_{t-1}} + \propto_2 \boldsymbol{lnY_t} + \propto_3 \boldsymbol{lnGNS_t} + \propto_4 \boldsymbol{lnFDI_t} + \propto_5 \boldsymbol{lnGTE_t} + \propto_6 \boldsymbol{lnINFC_t} + \propto_7 \boldsymbol{lnSMC_t} + \propto_8 \boldsymbol{lnDR_t} + \propto_9 \boldsymbol{lnPSP_t} + \in_t$$

Where (t = 1,.., T) signifies the time period in the given equations, The first section of the equation shows that several elements influence economic growth (Y): capital development, Gross National Savings (GNS), Foreign Direct Investment (FDI), Government Expenditure (GTE), Inflation Rate (INFC), Stock Market Capitalization (SMC), Interest Rate (DR), and Political Stability Index (PSP).

The second part of the equation shows that economic growth (YY), Gross National Savings (GNS), Foreign Direct Investment (FDI), Government Expenditure (GTE), Inflation Rate (INFC), Discount Rate (DR), Stock Market Capitalization (SMC), and the Political Stability Index (PSP) affect capital creation.

This dual attention enables a study of the intricate interaction between both factors by allowing one to examine how economic development affects capital accumulation and vice versa.

The Data and Variables

This study investigates the relationship of capital formation with level of economic growth in Pakistan by employing time series data for the period 1972 to 2020. The data for the variables included in the research is collected from world development indicate (WDI), world governance indicator (WGI) and national association of securities dealers automated quotations (NASDAQ) for the years started from 1772- 2020. The dependent variable in this study is gross domestic product (GDP) of Pakistan Current US $) and the independent variables are direct saving, foreign direct investment, gross national saving, government expenditures, inflation rate, gross fixed capital formations, discount rate, political stability index and stock market capitalization. E-views software is used for the estimation of the following variables.

Foreign Direct Investment (FDI)	FDI, or cross-border capital flow, is the process by which an investor from one nation gains a long-standing ownership and manages a foreign company. Different from portfolio investments, FDI is distinguished by its long-term commitment and participation in the transfer of capital, technology, and managerial knowledge, therefore acting as a major driver of economic development and integration within global value chains.
Gross National Saving (GNS)	GNS, adjusted for net current transfers, captures the total savings of an economy, determined from the difference between Gross National Income (GNI) and aggregate spending. GNS is a fundamental macroeconomic indicator that shows the internal financing capacity of an economy, therefore affecting balance of payments dynamics, capital building, and resistance to outside shocks.
Government Expenditure (GE)	GE includes consumption, infrastructure investment, social safety nets, and overall fiscal outlays on public goods, services, and transfers including consumption. Macroeconomic stability depends on GE's composition and efficiency, which also affect aggregate demand, income redistribution, and public service quality, so determining long-term development paths.
Inflation Rate (INFC)	The assessment of the rate of increase in the general price level of goods and services by the INFC reveals declining buying power of currencies. Constant inflationary trends can throw off markets and demand central bank interventions via monetary policy adjustments to maintain economic predictability and price stability.
Discount Rate (DR)	Set by central banks, the DR is a fundamental instrument for monetary policy regulating financial institution short-term borrowing costs. By means of control of the DR, central banks influence liquidity, short-term interest rates, and more general economic activity, therefore steering the economy towards expected macroeconomic outcomes.

Political Stability (PSP)	PSP gauges political institution resilience, government effectiveness, and rule of law observance. By reducing political uncertainty and hence increasing investor confidence and permitting consistent economic planning and growth, it is crucial in creating an environment fit for economic development.
Gross Fixed Capital Formation (GFCF)	Reflecting the investment in an economy in its productive capacity, GFCF is a measure of net investment in physical assets. GFCF, a major engine of economic development, represents investments in both tangible and intangible assets, therefore expressing corporate confidence and future production potential.
Stock Market Capitalization (SMC)	Representing the whole market value of exceptional equity, SMC acts as a benchmark of financial market maturity. A high SMC points to a developed market with strong investor confidence and liquidity, so supporting economic growth and offering a barrier against financial turbulence. Examining SMC in line with P/E ratios provides a whole picture of future economic possibilities and market stability.
Gross Domestic Product (GDP)	Calculating the full worth of all produced final goods and services within a country during a particular period, GDP, or gross domestic product, Including consumption, investment, government spending, net exports, it catches the whole state of the economy. GDP determines both living standards, economic performance, and growth rates as well as direction of budgetary and financial decisions. Reported in many forms—nominal, real, and per capita—it is supposed to assist explain population swings and inflation, therefore providing a whole picture of economic development and welfare.

ANALYSIS

Descriptive Statistics

The study will begin with empirical statistics since empirical analysis is essential for clarifying the link between capital development and economic growth in Pakistan for several very convincing reasons. It exceeds the constraints of simply theoretical models by using actual data to provide significant insights on economic dynamics. Empirical study of historical data on capital creation and economic growth uncovers trends, patterns, and connections often hidden by theoretical abstraction.

Policymakers must grasp these factual connections if they are to create complex plans to promote economic growth. Empirical analysis provides insights that let legislators create focused actions meant to maximize the effectiveness of capital investment in fostering economic development, hence optimizing economic gains. Pakistan's special economic situation, marked by different possibilities and problems, calls for a customized empirical

method. Pakistan's economic structure, developmental level, and policy environment define the interplay between capital creation and economic growth in certain ways unlike in other nations. Empirical study offers a detailed picture of these interconnections that considers the unique economic environment of the nation.

Moreover, the dynamic character of capital creation and economic growth under influence of governmental decisions, technology development, and world economic situation calls for a technique that catches these changing interactions across time. A strong framework for comprehending these dynamics is provided by empirical analysis, which guarantees correct representation of the interactions between variables over several temporal backgrounds. Moreover, by using real-world facts, empirical study helps to either support or refute theoretical ideas. This approach guarantees that the models used are relevant and accurate within the Pakistani setting by verifying or disprobing theoretical assumptions. Time series data for direct saving (DS), foreign direct investment (FDI), government expenditure (GE), inflation rate (INFR), stock market capitalization (SMC), discount rate (DR), gross fixed capital creation (GFCF), political stability index (PSP), and gross domestic product (GDP) in Pakistan from 1972 to 2020 is analyzed in this paper. The table below offers information on the standard deviation together with explanations of these variables.

variable	Mean	Std.Dev.	Min	Max
GDP	4.679959	2.209955	-1.329520	10.2157
DR	11.33184	3.501352	6.250000	20.00000
FDI	0.761224	0.772314	0.020000	3.670000
GNS	14.46776	2.544351	10.19000	21.29000
GTE	17.96408	2.596956	13.20000	23.29000
INFC	9.024490	5.153099	2.530000	26.66000
PSP	7.379097	4.702470	0.473933	15.87300
SMC	1.59	2.74	5.40	9.98
GFCF	15.70772	1.853036	11.33000	19.11200

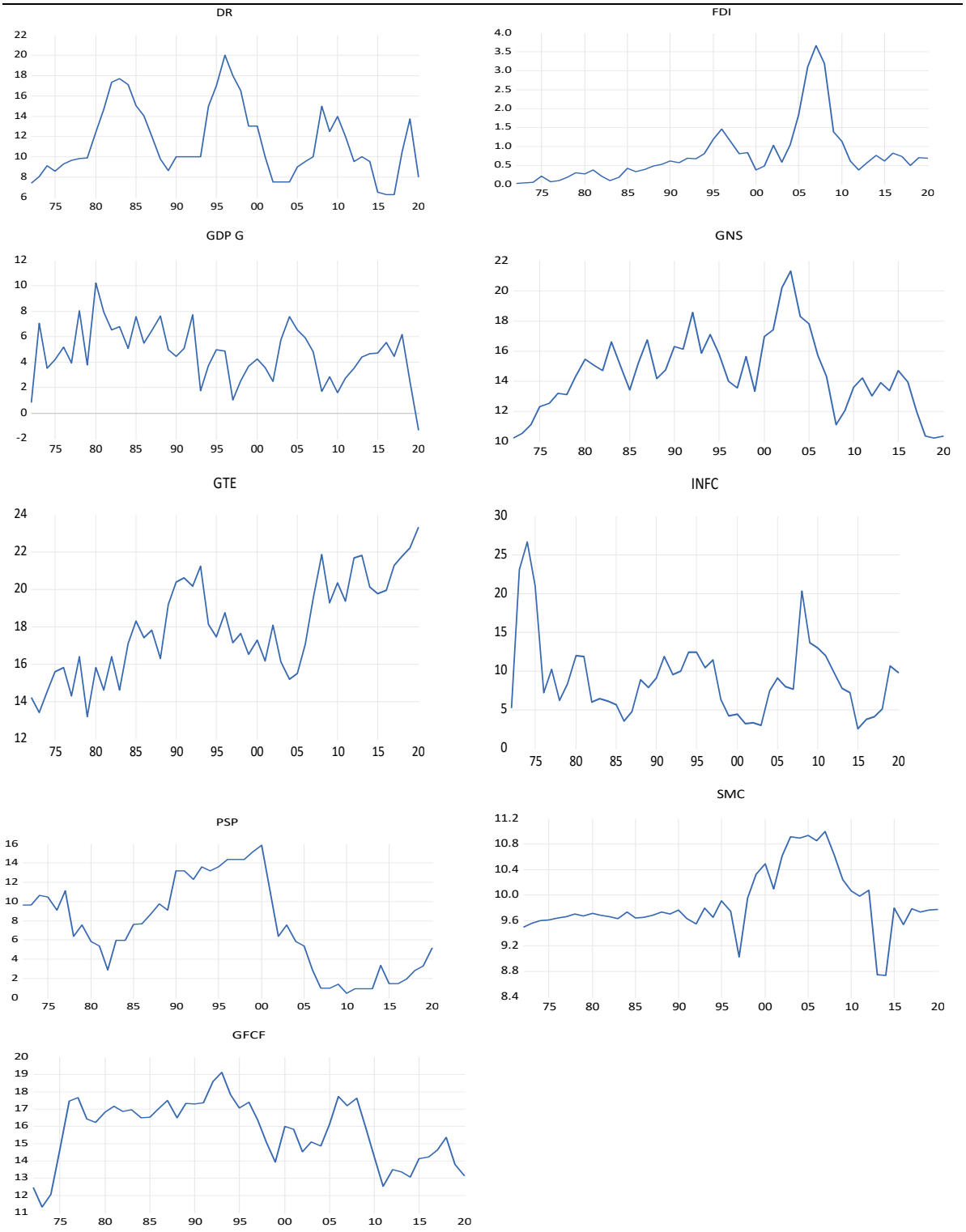
Comparatively to the mean value of GDP, the mean values of Foreign Direct Investment (FDI) and Stock Market Capitalization (SMC) are rather low. Periods of low FDI, especially in times of strife between Pakistan and India, help to explain this difference in some measure. Furthermore, the low mean value of SMC shows the past lack of industrial growth of the nation.

The graphical movement of variables

Graphical movement of variables over time provides a visual representation of individual development and interaction during the course of the investigation. Examining these time series graphs helps one to find data anomalies, trends, and cycles. Through the identification of

trends, changes, and correlations among the variables by way of this graphical examination, one may grasp their dynamic behavior and interrelationships throughout time.

The Graphical Moments of All Variables Over Time



Identification of long-term equilibrium linkages between capital creation and economic growth depends much on advanced methods including cointegration analysis and Granger causality testing. Developing sensible economic policies and strategies anchored in evidence rather than theoretical conjecture depends on an empirical knowledge that is absolutely necessary.

Unit Root Test

Using the Dickey and Fuller (1981) paradigm, the Augmented Dickey-Fuller (ADF) test helps one investigate the unit roots. The ADF test has as its general form:

$$\boldsymbol{\Delta X_t = \delta X_{t-1} + \sum_{J-1}^{q} \phi_i \Delta X_{t-i} + e_{1t}}$$

$$\boldsymbol{\Delta X_t = \propto_0 + \delta X_{t-1} + \sum_{j-1}^{q} (\phi_i \, \Delta X_{t-1} + e_{2t})}$$

$$\boldsymbol{\Delta X_t = \propto + \beta_t + \delta X_{t-1} + \sum_{j-1}^{q} (\phi_i \, \Delta X_{t-1} + e_{3t})}$$

H_0: $\delta = 0$ Null hypothesis, the data is not stationary. There exists unit root.

H_1: $\delta < 0$ alternative hypotheses, data is stationary. Unit root does not exists

We reject the null hypothesis if the p-value is less than 0.05, therefore showing that the data is stationary and lacks a unit root. On the other hand, if the p-value is higher than 0.05 we fail to reject the null hypothesis, implying that the data is non-stationary and that a unit root exists in it. Before econometric and time series analysis, one need verify the variables stationarity. We applied augmented dickey fuller unit root test to investigate the stationarity. Particularly in identifying the existence of a unit root, the Augmented Dickey-Fuller (ADF) test is a frequently used statistical tool for assessing the stationarity of a time series. A key component of time series analysis, particularly in forecasting, stationarity is especially important as many models assume the underlying time series data to be stationary.

Unit Root Test Results

Variables	I (0)	I (1)
	Prob.	**Prob.**
DR	0.2340	0.0001
FDI	0.1260	0.031
GDP	0.4370	0.0000
GNS	0.1570	0.0000
GTE	0.1902	0.0000
INFC	0.2958	0.0144
PSP	0.1390	0.0000

SMC	0.2560	0.0000
GFCF	0.1770	0.0000

The above table depicts the results of Dickey fuller test where all the variables are stationary at first difference for a probability of 5 percent level of significance.

Granger causality test

This work uses the Granger causality test to identify the direction of the relationship between dependent and independent variables in the model. Engle and Granger (1987) reasoned that in a model if two variables have a cointegration relationship, there must be either bidirectional or unidirectional causality between them. Two stationary variables can be used in order to determine which hypothesis supports the existence of Granger causality.

Pair-Wise Granger Causality Test

The cause-and- effect relationship between the variables utilized in the model—more especially, the causal links among them—is investigated using the pairwise Granger causality test. Based on probability values less than or equal to 0.05, the paired Granger causality test's findings—which show in the table below—indicate numerous noteworthy uni-directional causal relationships.

From government expenditure (GE) to GDP, from GFCF to the discount rate (DR), from government expenditure (GE) to GDP, from GFCF to the discount rate (DR), from foreign direct investment (FDI) to GFCF, and from gross national saving (GNS) to FDI in Pakistan the results expose a uni-directional causal relationship from gross domestic product (GDP) to gross fixed capital creation (GFCF).

Does not granger cause	**F- Statistics**	**Prob.**
GDP does not granger GFCF	3.92289	0.0274
GTE does not granger GDP	3.31780	0.0459
GFCF does not granger DR	3.78943	0.0307
FDI does not granger GFCF	4.89923	0.0122
GNS does not granger FDI	3.95844	0.0266

Co-integration test

A statistical feature known as co-integration shows non-stationary time series variables a consistent, long-term relationship. The individual series may show non-stationary behavior, but their linear combinations can be stationary, therefore reflecting a common long-term trend. Analyzing long-run equilibrium linkages between variables requires the identification of co-integration; this is especially crucial in economic and financial time series where variables often show coordinated motions across time despite short-term instability. Emphasizing how they interact and change to maintain equilibrium over long times, the long-run model is meant

to capture and examine these continuous interactions among co-integrated variables. The basic justification for cointegration is that, even if two or more time series show trends, their difference stays constant if, over time, they move closely together. Since their differences are stationary, such series are regarded to have a long-run equilibrium relationship. Dickey et al. (1991) maintained that the lack of cointegration suggests no long-run link among the variables. This forms the cointegration equation:

$$[\eta \boldsymbol{logPRC} = \boldsymbol{a_1} + \sum_{\boldsymbol{I=2}}^{\boldsymbol{P}} (\boldsymbol{a_1}\eta \boldsymbol{Z} - [\eta \boldsymbol{logPRC} - \sum \boldsymbol{\beta X} + \boldsymbol{V})]$$

Where $\eta \boldsymbol{logPRC} - \sum_{\boldsymbol{I=1}}^{\boldsymbol{p}} \boldsymbol{\beta X}$

It is a linear combination of non-co-integrated vectors, where X represents the vector of non-co-integration variables. It is necessary to perform the co integration test to make a long run relationship among variables. All the series in the model are stationary at I (1) level without taking log. The co integration test through Johanson co integration test can be performed without taking log transformation of the original data in the model. The decision making criteria for the Johanson co integration test is that, if the value of the trace and the maximum statistic is greater than 5 percent critical value, the null hypothesis is rejected. It means that the series are co integrated. The results of Johanson co integration test are displayed in table below.

Johanson co-integration test
Unrestricted co-integration rank test (Maximum Eigen value)

Hypothesized no. of CE	Eigenvalue	Trace Statistic	Critical Value (0.05)	Prob.
NONE*	0.765574	69.62959	59.24000	0.0036
At most 1*	0.734681	63.68794	53.18784	0.0031
At most 2	0.401359	24.62844	74.07897	0.9821
At most 3	0.342956	20.16019	40.95680	0.9793
At most 4	0.320990	18.58173	34.80587	0.8904
At most 5	0.222414	12.07490	28.58808	0.9596
At most 6	0.183750	9.745665	22.29962	0.8544
At most 7	0.076595	8.824999	15.89210	0.9656
At most 8	0.063381	3.142993	9.164546	0.5544

The findings of the Johansen co-integration test show that among the variables under investigation there is a notable long-run correlation. The trace statistic value of 69.62959 in the first row (None*) surpasses the 0.05 critical value of 59.24000, and the related probability value of 0.0036 is smaller than 0.05. These results indicate the presence of a co-integration link among the variables, therefore enabling us to reject the null hypothesis.

With a probability value of 0.0031, which falls below the 0.05 level, the trace statistic value of 63.68699 is also more in the second row (at most 1* than the crucial value of 53.18784. This implies that we can reject the null hypothesis, which holds at least one co-integration equation present. Reversing this null hypothesis suggests the existence of several co-integration equations.

But in the third row (at most 2), the probability value of 0.9821 surpasses the 0.05 critical value of 74.07897 and the trace statistic value of 24.62844 is less than that. We so do not reject the null hypothesis, so showing that there are at most two co-integrating equations. Likewise in the fourth row (at most 3), the probability value of 0.4793 is higher than the 0.05 critical value of 40.95680 and the trace statistic value of 20.16019 is smaller than this value. This outcome also produces the null hypothesis not rejecting.

The trace statistic value of 18.58173 is less than the 0.05 critical value of 34.80587 in the fifth row (at most 4), so the probability value of 0.8904 is higher than 0.05. This negligible probability value shows that the null hypothesis cannot be disproved.

The null hypothesis for the existence of at most two co-integration equations is not refuted, thereby stating that at the 0.05 significance level there are at most two co-integrating relationships. Since at least two of the six equations have statistically significant at least at the 5% level, the null hypothesis for no co-integration among the variables is disproved.

These findings validate the presence of a long-run relationship among the variables, which comprise direct saving, foreign direct investment, gross national saving, government expenditures, inflation rate, gross fixed capital formation, discount rate, political stability index, stock market capitalization, and economic growth in Pakistan. The table below shows the exact analysis results.

The Co-Integration and Short & Long Run Model

Long-Run Dynamics

$$\mathbf{ECT_{t-1} = 1.0000\ GDP_{t-1} + 0.080\ DR_{t-1} - 6.934\ FDI_{t-1} - 0.5576\ GFCF_{t-1} - 0.133\ GNS_{t-1} + 0.433\ GTE_{t-1} + 0.1966\ INFC_{t-1} + 0.1966\ PSP_{t-1} + 1.758\ SMC_{t-1} - 22.90}$$

These figures greatly affect GDP, hence they draw attention to the intricate interactions among numerous elements and general performance. A one percent point change in the Discount Rate (DR) increases borrowing costs and reduces economic activity, therefore lowering GDP.

The crowding-out effect shows that because of its impact, a rise in Government Spending (GE) causes a 0.433% GDP decrease in private sector investment.

A one percent point rise in the inflation rate (INFC) reduces the GDP by 0.1966% since high inflation reduces purchasing power and lowers consumption.

A one percent point change in Political Stability (PSP) lowers GDP by 0.66% due to more uncertainty and less investment incentives. The economy is much affected by stock market capitalization (SMC since a one percentage point drop in GDP reflects the wider effects of lower investor confidence. Improved capital and productivity allow a one percentage point rise in Foreign Direct Investment (FDI) to boost GDP by 6.934%. Driven by physical assets, GDP growth shown by Gross Fixed Capital Formation (GFCF) is 0.5576%. Smart investments contribute to boost Gross National Saving (GNS) also, therefore boosting GDP by 0.134%.

Short run Dynamics

$$\Delta Y_t = \sigma + \sum_{i=1}^{k-1} Y_i \Delta Y_t + \sum_{j=1}^{k-1} n_j \Delta X_{t-J} + \sum_{m=1}^{k-1} \varepsilon_i \Delta R_{t-m} + \lambda ECT_{t-1} + \mu_t$$

$$\Delta GDP = -0.692ECT_{t-1} - 0.158GDP_{t-1} - 0.1088DR_{t-1} - 0.2399FDI_{t-1} + 0.0608GFCF_{t-1} + 0.1580GNS_{t-1} + 0.0319GE_{t-1} + 0.1418INFC_{t-1} + 0.2183PSP_{t-1} + 1.16958SMC_{t-1} - 0.0986$$

Adjustment Speed:

The economy returns to its long-term equilibrium at a pace of 6.9% per year, correcting deviations over multiple periods.

Economic indicators have different effects on GDP in the near run depending on some elements slowing down or accelerating development. The economy progressively adapts to changes and over time finds its long-term balance. Should GDP stray from its long-run equilibrium, 6.9% of that departure is offset in the next year, so guiding a slow return to stability.

One percent decrease in the Discount Rate (DR), shows to lower the GDP by 0.1%; and Foreign Direct Investment (FDI) lowers it by 0.2399%. Conversely, a unit rise in Stock Market Capitalization (SMC) increases GDP by 0.06%; Gross National Saving (GNS) by 0.158%; Government Expenditure (GE) by 0.31%; Inflation Rate (INFC) by 0.1418%; Political Stability (PSP) by 0.2183%. Moreover amazing is SMC's 1.16958% GDP increase for every 1% increase, underlining the intimate link between a strong stock market and economic performance.

Basically, while more DR and FDI can reduce GDP in the near run, positive contributions from SMC, GNS, GE, INFC, and PSP fuel growth; with the economy slowly heading toward long-term equilibrium.

The paper uses the Vector Error Correction Model (VECM) framework to evaluate the short-run deviations from this long-run equilibrium route. By means of the VECM, one can explore

the disequilibrium by analyzing the rate of convergence back to the long-run equilibrium. This helps one to understand how quickly the system corrects itself following a disruption, therefore clarifying the short-run dynamics and the adjusting mechanism towards the long-run equilibrium.

Vector error correction equation (VECM)

When variables are co-integrated, the Vector Error Correction Model (VECM) is used to model the long-run relationships while simultaneously accounting for short-term dynamics. The VECM is specified as follows:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta y_{t-1} + \sum_{i=1}^{n} \delta_1 \Delta x_{t-1} + \varphi z_{t-1} + \mu_t$$

In the above equation z is the ECT (adjustment) of OLS residuals from the following long run co integration regression.

$$Y_t = \beta_0 + \beta_1 x_t + \varepsilon_t$$

And is defined as

$$Z_{t-1} = ECT_{t-1} = Y_{t-1} - \beta_0 - \beta_1 X_{t-1}$$

"Error correction" is the process by which the short-run dynamics of the dependent variable are influenced by deviations from the long-run equilibrium recorded in the past (the mistake). Represented by ϕ, the coefficient of the ECT gauges the speed of adjustment, hence defining how quickly the dependent variable Y returns to its long-run equilibrium in response to changes in X.

The Vector Error Correction Model (VECM) can be used to investigate both the short-run and long-run dynamics of the series should non-stationary yet I(1) time series prove to be cointegrated. The Johansen cointegration test shows that the variables have a long-run relationship, so the VECM is a good method for examining the dynamic interactions among them.

Variable	Co-Efficient	Std. Error.	T-Statistics	Prob.
C(1)	-0.692400	0.229899	-3.011762	0.0047
C(2)	-0.158450	0.162954	-0.972357	0.3374
C(3)	-0.108850	0.145629	-0.747450	0.4596
C(4)	-0.239974	0.718290	-0.334090	0.7402
C(5)	0.060502	0.287664	0.210323	0.8346
C(6)	0.158064	0.182158	0.867734	0.3913
C(7)	0.031994	0.205961	0.155340	0.8774
C(8)	0.141807	0.074373	1.906708	0.0646
C(9)	0.218338	0.177590	1.229455	0.2269
C(10)	1.169597	0.800708	1.460704	0.1528

C(11)	-0.098614	0.266940	-0.369425	0.7140
R-squared	0.512764	Akaike info criteria		4.224236
Adjusted R-squared	0.377421	Schwarz criteria		4.657249
F-statistic	3.788618	Hannan-Quinn criteria		4.387181
Prob. (F-statistic)	0.001491	Durbin-Watson criteria		2.109696

With a negative and significant coefficient C(1), the independent variables have long-run causation toward GDP. With a negative sign, C(1) indicates that over time the economy often returns to its equilibrium. Should GDP stray from its long-term equilibrium, this coefficient indicates that the economy will progressively rectify this departure, hence restoring its equilibrium state. Though this is not the case here, a positive C(1) would imply that deviations from equilibrium result in more divergence.

Expanding the short run aspect, C(2) shows that a 1% rise in GDP itself causes a 0.1% drop in GDP. This apparently contradictory outcome would point to either oversimplification or a model definition problem. Usually one would expect a direct proportional connection, hence this result could imply intricate underlying dynamics in the data. C(3) shows that GDP falls 0.1% for a 1% rise in the Discount Rate (DR).

The discount rate is the central bank's interest rate applied for bank borrowing. Rising discount rates raise the cost of borrowing, therefore affecting consumer and company investment and expenditure. From this slowed down of economic activity, less GDP follows. C(4) shows that the GDP declines 0.2% for every 1% increase in foreign direct investment (FDI). While over time FDI is usually projected to boost GDP, this temporary decline could suggest ephemeral shifts or market reactions to the flood of foreign capital, such as currency appreciation or more competition.

From a 1% increase in Gross Fixed Capital Formation (GFCF), C(5) shows a 0.06% increase in GDP. GFCF consists of acquisitions of machinery and infrastructure among tangible items. These kind of expenses increase production capacity and help to boost economic growth. For a 1% increase in Gross National Saving (GNS), C(6) demonstrates that GDP increases 0.1%.

More money for investment made possible by higher national savings helps to support new projects and capital upgrades, therefore fostering economic development. C(7) shows that GDP rises 0.03% for a 1% rise in Government Expenditure (GE). Although the impact is somewhat small in our scenario, increased government expenditure can directly infuse money into the economy, therefore stimulating economic activity. C(8) shows that a 0.14% rise in GDP

follows from a 1% increase in the inflation rate (INFC). Mild inflation could encourage expenditure since consumers and companies expect future prices to be higher, hence perhaps increasing short-term economic activity. C(9) shows that GDP rises 0.2% for every 1% improvement in political stability (PSP). More political stability lowers uncertainty, boosts economic confidence, and creates a good setting for investment and economic activity. C(10) shows that GDP rises 1.1% when Stock Market Capitalization (SMC) increases 1%. More investor confidence and wealth reflected in a higher stock market capitalization helps to greatly boost consumer spending and corporate investment. This coefficient, C(11), shows the constant or intercept in the model, therefore providing the baseline level of GDP should all other variables be zero.

Diagnostic tests

This study conducted diagnostic tests Jarque- Bera, Breusch Godfrey, Breusch pagan tests for VECM model. The test results are presented in the table given below.

Jarque-Bera, Breusch-Godfrey, and Breusch-Pagan tests

The validity and robustness of the Vector Error Correction Model (VECM) were assessed in the paper by means of several diagnostic tests. The Breusch-Godfrey test, the Jarque-Bera test, and the Breusch-Pagan test make up these exams.

Test type	Null hypothesis	statistic	probability	inference
Normality test (jarque-Bera test)	Errors are normally distributed	Jarque-Bera (16.86)	Prob. (0.5327)	Fail to reject H_0
Serial correlation (Breusch –Godfrey serial co relation test)	No serially correlated errors	F-Statistics (60.66)	Prob. Chi-square (0.9650)	Fail to reject H_0
Heteroskedasticity test (Breusch pagan Godfrey)	homoscedasticity	F-Statistics	Prob. Chi-square (0.2595)	Fail to reject H_0

The preceding table's outcomes offer understanding of the model's diagnostic quality. They guarantee that the VECM's basic presumptions are satisfied as well as that the model's conclusions are valid and dependable. The following is a synopsis of every test together with its aims.

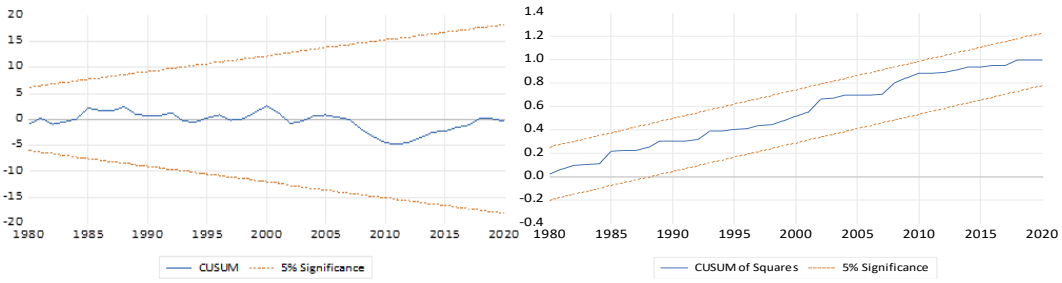
Crucially for the presumptions underpinning many statistical models, the Jarque-Bera Test assesses the normalality of the residuals from the VECM. The data reveal no considerable residual serial correlation.

The Breusch-Pagan Test is This test searches for heteroscedasticity—that is, variance in the residuals over data. According to the results, residual variations are not troublesome.

Diagnostic results reveal that the model is free from the non-normality of the errors, serially correlated errors and heteroskeasticity from the probability values of higher than 5%.heteroskeasticity from the probability values are more than 5%.

Stability Test

The stability test findings, including both the CUSUM and CUSUMQ plots, fall inside the crucial boundaries at the 5% significance level. This confirms the stationarity of the coefficients and demonstrates the accurate specification of the VECM model. Therefore, the study indicates that the model has successfully passed all specification and efficiency tests and is judged acceptable. Overall, these diagnostic tests indicate that the VECM's assumptions are satisfied, ensuring the model's validity and resilience.



DISCUSSION

In line with previous studies like Akindele (2010), the findings of this study highlight the important part capital creation performs in promoting economic growth. Under examination, the empirical study validates a strong long-term equilibrium link among the variables. Particularly the Johansen co-integration tests expose a stable long-run relationship between Gross Domestic Product (GDP) and several important explanatory variables: Discount Rate (DR), Foreign Direct Investment (FDI), Government Expenditure (GE), Inflation Rate (INFC), Gross Fixed Capital Formation (GFCF), Political Stability Index (PSP), and Stock Market Capitalization (SMC). Notwithstanding occasional volatility, this long-term co-integration suggests that these variables usually move together over time to expose a shared underlying economic equilibrium.

Pairwise Granger causality testing helps one to further grasp the directional connections among these variables. The results suggest that GDP influences Gross Fixed Capital Formation

(GFCF), therefore suggesting that economic growth drives fixed capital investment. Analogous to this, Government Expenditure (GE) causes GDP to rise, therefore validating the Keynesian theory that more government expenditure can boost economic activity. The study also shows that GFCF influences the Discount Rate (DR), which in turn influences investment decisions; foreign direct investment (FDI) influences GFCF, therefore indicating that foreign investments help to generate domestic capital. Furthermore, Gross National Saving (GNS) influences FDI, therefore emphasizing the need of greater national savings in drawing more foreign direct investment.Applying the diagnostic tests to the model helps to confirm its dependability and strength. The Jarque-Bera test validates the normal distribution of the residuals from the VECM, therefore fulfilling the necessary condition for the validity of the model. The absence of serial correlation in the residuals of the Breusch-Godfrey test guarantees the accuracy of the estimations of the model. Moreover, the Breusch-Pagan test guarantees that heteroscedasticity is not a problem, therefore suggesting that the residual variances are constant over observations.

Stability tests confirm that the coefficients of the model remain steady over time including the CUSUM and CUSUMQ. This stability is absolutely vital to guarantee that the parameters of the model remain constant, therefore strengthening the validity of the findings. This point of view is underlined by the great validity of the Vector Error Correction Model (VECM) in characterizing the dynamics of economic growth and capital generation.

At last, the findings of the research confirm that the VECM is well-defined and efficient, therefore providing a consistent framework for analyzing the complex interactions among capital development, economic growth, and other significant elements in Pakistan. Different diagnostic tests confirm the resilience of the model, therefore supporting its applicability in directing long-term economic trends and economic policy.

Conclusion

The path of economic development and general prosperity within a nation is much shaped by capital creation. Particularly for less developed countries, development economists underline capital creation as the pillar of continuous economic progress. Rising capital creation in these nations greatly increases national output and helps to meet the needs of a growing population (Akindele et al., 2010). Classical economists have long seen capital accumulation as essential for economic development, implying that it finally results in a stationary state where ongoing

expansion stops. Modern economists, however, understand that the constant process of capital creation always influences long-term economic progress.

Long seen as a fundamental component of economic progress by academics including Lewis, Myrdal, Nurkse, Rosenstein-Rodan, Sevtorsky, and Streeten is capital development. Though this awareness exists, little study has been done on Pakistan's dynamic interaction between capital creation and economic growth. Especially, few studies combining short- and long-term viewpoints inside a single framework to reasonably evaluate estimators have been published.

Using annual time series data from 1972 to 2020, this paper fills in this research void by investigating the dynamic interaction between capital accumulation and economic growth in Pakistan. Examining several independent variables— Discount Rate (DR), Foreign Direct Investment (FDI), Government Expenditure (GE), Inflation Rate (INFC), Gross Fixed Capital Formation (GFCF), Political Stability Index (PSP), and Stock Market Capitalization (SMC)— Gross Domestic Product (GDP) as the dependent variable is examined. These variables were found to be stationar using the Augmented Dickey-Fuller test; some were stationary at the level while others needed initial differences.

Then long- and short-term dynamics among the variables were examined using the Johansen Co-integration test and Vector Error Correction Model (VECM). Confirming a long-run equilibrium link between capital creation and economic development, the Johansen test From GDP to GFCF, from GE to GDP, from GFCF to DR, from FDI to GFCF, and from GNS to FDI, the Granger causality tests found multiple uni-directional causal linkages without bi-directional causality noted.

These results draw attention to Pakistan's complicated and dynamic link between economic development and capital creation. The Pakistani government should apply policies meant to improve capital creation in order to fully use these findings. Such policies could call for encouraging investment, enhancing political stability, and streamlining of capital market efficiency. Pakistan may promote more sustainable development and economic growth by establishing a more friendly environment for capital formation.

Policy Recommendations

The results and debates lead the government of Pakistan to produce many policy proposals based on which capital creation should be used as main engine of economic growth and development. These suggestions seek to increase capital creation, strengthen economic stability, and promote sustainable development by means of which:

Policies meant to raise the savings-to---GDP ratio must be carried out considering the strong favorable link between capital creation and economic growth seen in Pakistan over both short and long terms. Such policies would not only improve national output and capital creation but also solve current capital shortages, boost investment prospects, draw foreign direct and portfolio investments, and increase capital building capability. These steps will help to promote constant economic growth and development by increasing capital building.

Pakistan has to implement investment-friendly policies that inspire and draw capital inflow if it is to properly increase capital generation. It is imperative to create an atmosphere fit for gross fixed capital development. This covers providing incentives to investors, guaranteeing regulatory certainty, and so enabling a supporting infrastructure for investment operations.

Given Pakistan's present lower per capita income trends, saving ratios are expected to stay small. Consequently, it is necessary to create investment-friendly rules that not only boost home savings but also draw international capital inflows. Such policies will support strong capital accumulation and help to overcome poor domestic savings, hence promoting economic development.

Add tax benefits for businesses and individuals wisely investing in productive assets. This would cover credits or deductions for purchases in sectors including manufacturing, technology, and infrastructure. Provide important sectors with considerable economic potential targeted grants or subsidies covering industrial automation, advanced technologies, and renewable energy.

Stress the need of eliminating corruption and improving governance standards to help to create a more uniform and predictable corporate environment. This will attract home as well as foreign capital. Consistent economic policy combined with openness will help to boost investor confidence and reduce political and economic instability related issues.

. Transparency and efficiency in financial markets would assist businesses to have easier access to money. This addresses new financial goods launch, regulatory simplification, and bettering of the financial infrastructure.

Essential for economic growth but sometimes difficult to secure finance, small and medium businesses (SMEs) should have funding programs and support systems created for them. Projects could demand for creating loan guarantees or venture capital companies. Increase public funding for major initiatives including public transportation systems, energy facilities, and port expansion. Good infrastructure improves economic performance and

increases other investment. Create public-private alliances to use corporate sector knowledge and financial capabilities for large-scale infrastructure projects.

Spending more R&D in key sectors will help to boost technical development and inventiveness. To reach this one uses grants, tax incentives, university and research institution alliances. Go digital to help businesses and government services to boost operational efficiency and generate new development opportunities.

Improve the caliber of vocational education and instruction so that the workforce has the tools required for economic development. Stressing STEM (science, technology, engineering, and mathematics) education will help to equip a workforce ready for tomorrow. Create courses that fit industry standards so graduates have skills fit for the market.

At last, direct government spending into projects with significant financial pay-off. Examine governmental expenditure to ensure it greatly promotes capital building and economic growth. Boost public expenditure efficiency and effectiveness to maximize the impact of government activities on economic growth.

These policy decisions will enable Pakistan to make appropriate use of capital generating to increase economic growth and development. A comprehensive and well-coordinated plan will create conditions suited for continued capital accumulation and long-term economic development.

REFERENCES

Adhikary, B. (2015), dynamic effect of FDI, trade openness, capital formation and human capital on economic growth in the least developed countries: Evidence from Nepal. *International journal of trade, economics and finance. Vol.6*, No.1, February 2015**.**

Akindele, O. (2010). *The casual relationship between capital formation and economic growth*: Retrieved from: https://www.researchgate.net/publication/326741004

Akobeng, E. (2016), Gross Capital Formation, Institutions and Poverty in Sub-Saharan Africa. *Journal of economic policy reform. Vol, 20*. Issue, 2. P, 136- 164.
Retrieved from; https://doi.org/10.1080/17487870.2015.1128833

Akindele, O. (2010). The relationship among export, import, capital formation and economic growth in Malaysia. *Journal of global economics 4*; 186. Doi;4172/2375-2389.1000186

Ali, G. (2015). Gross fixed capital formation and economic growth of Pakistan. *Journal of research and humanities, art and literature, vol 1*, p 21-30.

Ali, S. Choudry, I. & Farooq, F. (2012). Human capital formation and economic growth in Pakistan, *Pakistan journal of social sciences 32* (1).

Ajose, K. & Oyedokun, G.E. (2018*). Capital formation and economic growth in Nigeria*. Retrieved from: http://www.atreview.org

Amjed, S. and shah, i. (2020), *Does financial system development, capital formation and economic growth induces trade diversification*? Retrieved from: https://www.emerald.com/insight/1859-0020.htm

Babatope, M. and Ogunniyi (2018), Human capital formation and economic growth in Nigeria. *African Educational Research Journal, v6* n2 p80-87 May 2018

Bal, D. & Bibhu, D. (2016). The effect of capital formation on economic growth in India, evidence from ARDL bound test approach. *Global business review, 17* (6), 1388-1400

Bishu, K. (2011). FDI, trade openness, capital formation and economic growth in Bangladesh. *International journal of business and management vol, 6*. No 1

.Bhmowik, D. and Alam, M. (2020), the casual relationship among imports, exports, capital formation and economic growth in Bangladesh. *IOSR Journal of humanities and social science. Volume. 25*, issue. 5, Series. 10, p 18-26

Doi, M. and Kawakami, T. (2005), Port capital formation and economic development in Japan: A vector auto regression approach. *Regional science association international, volume.83,* issue.4, P. 723-732, Oct 2004.

Doucouliagos, C. and In, F. (2006), Human capital formation and US economic growth: a causality analysis. *Applied economic letters, volume. 4,* Issue. 5, P. 329-331, Nov 2006.

Elfaki, K. and Anwar, N. (2021), Examining the Relationship between Energy Consumption, Economic Growth, and Environmental Degradation in Indonesia: Do Capital and Trade Openness Matter? *International journal of renewable energy development, 10* (4), 769-778. Retrieved from: https://ijred.undip.ac.id

Feddersen, M., Nel, H. & Botha F. (2017). Export, capital formation and economic growth in South Africa, *vol. 9*, no. 1.

Gibescu and Octavia (2010), *Does the gross fixed capital formation represent a factor for supporting the economic growth? Munich personal Repec archive (MPRA).* Retrieved from; https://mpra.ub.uni-muenchen.de/50135/

Ghani, irfan M, Shahid M and Muhammad. (2012). Human capital formation and economic development in Pakistan. *Munich personal REPEC Archive.MPRA paper No, 38925* Retrieved from; http;//mpra.ub.uni-muenchen.de/38925/.

Ghosh, S. (2019), Foreign Direct Investment, Female Education, Capital Formation, and Economic Growth in Japan and South Korea. *International economic journal. Volume, 33*. Issue, 3 .P, 509-536. Retrieved from;

Harari. (2014). Sapiens. A brief history of humankind, *v3*.1, 274-276.

Kahuli and Bassim. (2019), Does static and dynamic relationship between economic growth and energy consumption exists in OECD countries? *Energy reports, ISSN 2353-4847, Elsevier, Amsterdam, Vol 5*, pp 104-116.

Kanu, I. benedict, A. (2014), capital formation and economic growth in Nigeria, *global journal in (USA), V14*.

Khan and uzma (2020), the nexus between urbanization, gross capital formation and economic growth: A study of Saudi Arabia. *The journal of Asian finance, economics and business. Volume, 7.* Issue, 12. P, 677-682.

Kesar, A. et al. (2022), Dynamics of governance, gross capital formation, and growth: Evidence from Brazil, Russia, India, China, and South Africa. *A journal of public affairs.*Retrieved from: https://doi.org/10.1002/pa.2831.

Kingsley,U and Lucky, L. (2016), determinants of capital formation in Nigeria. *International journal of business and finance research. Vol.2*, No, 1. 2016.

Liaqat, Z. (2019), Does government debt crowd out capital formation? A dynamic approach using panel VAR. *Vol, 178*. P, 86-90. Retrieved from; https://doi.org/10.1016/j.econlet.2019.03.002

Mishra. (2010), capital formation and economic growth: dynamics. *SCMS journal of Indian management, volume. 7*, issue. 3, P, 5-15, Jul 2010

Narayan, p. k. (2005) 'the saving and investment nexus for china; evidence from co integration tests the saving and investment nexus for china; evidence from co integration tests', 6846.*doi;10.1080/00036840500278103*

Ogunsola, A. and Adeyemi, P. (2019). The impact of human capital development on economic growth in Nigeria: ARDL approach. *IOSR Journal of Humanities and Social Science, Volume. 24*, Issue. 1, Ser. 6, P. 34-41, Jan 2019.

Onyinye, N. Idenyi O. & ifeyinwa, A. (2017). Effect of capital formation on economic growth in Nigeria. *Asian journal of economics, business and accounting*, 1-16.

Pasara, M. and Garidzirai, R. (2020). Causality Effects among Gross Capital Formation, Unemployment and Economic Growth in South Africa. *Economies, vol, 8*. Issue, 2. Retrieved from; https://doi.org/10.3390/economies8020026.

Perasan, M. H., Shin, Y. and Smith, R. J (2001) 'bounds testing approaches to the analysis of level relationships', *journal of applied econometrics, 16*(3),pp. 289-326, doi; 10.1002/jae.616.

Pradham, P. Arvin, B. mittal, J. & Bahmani, S. (2016). Relationship among telecommunication infrastructure, capital formation and economic growth. *Home international journal of technology management vol. 70*, No 2-3. pp 157-176.

Obsatar, S. Haizam, M. Djoko, R. & Shahril, M. (2019). The dynamic relationship between natural gas and economic growth: Evidence from Indonesia. *International journal of energy economics and policy, 2019, 9*(3), 388-394.

Shahbaz, M. khan, S. & Tahir, M. (2013). The dynamic links between energy consumption, economic growth, financial development and trade in china. *Energy economics, v 40.* P 8-21.

Shuaib, M. and Ndidi, D. (2015), capital formation: impact on the economic development of Nigeria 1960-2013. European journal of business, E*conomics and accountancy. Vol, 3.* No, 3.

Stevenson, B. Wolfers, J. (2008). *Economic growth and subjective wellbeing:* national bureau of economic research. Retrieved from; http://users.nber.org/~jwolfers/Papers/EasterlinParadox.pdf

Stuonikova, E. and Sukhadolets, T. (2019), Construction Sector Role in Gross Fixed Capital Formation: Empirical Data from Russia. *Economies, vol, 7*. Issue, 2. Retrieved from; https://doi.org/10.3390/economies7020042

Ugochukwu, U. & Chinyere, U. (2013). The impact of capital formation on the growth of Nigerian economy. *Research journal of finance and accounting, vol 4*, no 9.

Uneze. (2013). *the relation between capital formation and economic growth; evidence from sub Saharan African countries*, 2013, p 272-286.

Yasmin, H., Tan, Q., Zameer, H., VO, X. and Shahbaz, M. (2021), discovering the relationship between natural resources, energy consumption, and gross capital formation with economic growth: Can lower financial openness change the curse into blessing, *Vol, 71*. Retrieved from: https://doi.org/10.1016/j.resourpol.2021.102013

Yasmin, T. Bekhet, H. (2017), Dynamic linkages among financial development, economic growth, energy consumption, CO2 emissions and gross fixed capital formation patterns in Malaysia. *Int. J. Business and Globalization, Vol. 18*, No. 4, 2017.