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Sectoral Investment and Economic Performance of Pakistan: A Time Series Analysis (1990 – 2021)

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ABSTRACT

The purpose of this study is to investigate the impact that various types of investments have had on Pakistan's overall economic performance. GDP, GDP per capita, inflation, and trade are the variables that are used to measure economic performance. For the purpose of this investigation, time series data from 1990 to 2021 has been collected, and the ADF unit root test and the ARDL technique have been utilized for analysis. The results of the ADF unit root explicate that GDP, GDP per capita, Trade, Investments in Agriculture, Manufacturing, Infrastructure, Energy, and Labor force are stationary at 1st difference and Inflation & Investment in Mining are stationary at the level. So, it is decided to apply the ARDL technique for long-run relationships. The results of ARDL long-run express that Investment in Agriculture sector, Infrastructure, Energy, Manufacturing, and Mining are a source of higher Nominal GDP and GDP per capita. The labor force has been positive for growth but negative with the price level. On the other hand, investments in agriculture and infrastructure may increase the price level of the economy but investment in energy, manufacturing, and mining may reduce the price level. The labor force also turns out to reduce price levels by enhancing output levels. For the trade model, Investments in Agriculture, Manufacturing, Infrastructure, and Energy have turned out to increase the trade of Pakistan while investment in mining and the labor force has been reducing factors for trade.

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1 Introduction

Investment in particular sectors or industries of an economy, such as manufacturing, agriculture, service industries, or technology, is referred to as sectoral investment. This term encompasses the allocation of capital as well as other resources. On the other hand, economic performance refers to the state of an economy as a whole and its rate of expansion. This is typically measured by metrics such as gross domestic product (GDP), employment rates, productivity, and trade balance. Investing in specific areas of the economy can have a direct effect on the performance of the economy for a variety of reasons, including increased productivity and innovation, increased employment and income generation, increased export-oriented industries, and increased sectoral linkages. It is essential for economic performance to make investments in the infrastructure, agricultural, industry, and energy sectors because these investments increase productivity, improve competitiveness, generate jobs, foster regional development, entice foreign direct investment, strengthen public services, and contribute to the sustainability of the economy. It is the pillar around which all other economic activities are built and makes possible the efficient operation of businesses as well as the expansion of communities. Because of this, governments and other policymakers understand the significance of making investments in infrastructure to encourage the growth of the economy in a sustainable manner.

In their study, Du, Zhang, and Han (2022) investigate the relationship between economic growth quality and infrastructure investment. Following the application of endogeneity treatments and robustness tests, new infrastructure investment tends to result in higher quality economic growth. The results of further mechanism studies indicate that investments in new infrastructure encourage technical innovation, industrial structure improvement, and production efficiency, all of which contribute to an improvement in the quality of economic growth. In developing countries, agricultural investment contributes to enhancing economic growth and poverty reduction. Mozambique is retrospectively examined in this study. Despite increasing farm spending, simulations show that the 2012–2017 investment plan would not meet national growth projections. Instead of irrigation and fertiliser subsidies, the government could have spent on agricultural research and extension. Smallholder extension programmes are best at boosting growth and eliminating poverty nationwide. Due to poor agro-ecological circumstances, irrigation would aid southern expansion more. These findings hold under investment efficiency assumptions. Our approach enhances household-level evaluations for national planning (Benfica, Cunguara, & Thurlow, 2019).

Han, Su, and Thia (2021) show that developing economies benefit more from infrastructure per worker. Sastra, Damanhuri, Achsani, and Yustika (2021) analyse the agriculture sector's 2011–2020 investment performance in incremental capital output ratio (ICOR), national economy contribution and capital formation. The study found that food crop agricultural investment performance changed from 2011 to 2020. The programme typically helped the agriculture sector, but in that vulnerable year, investment leakage increased efficiency.

Seidu, Young, Robinson, and Michael (2020) study how infrastructure financing affects economic growth. Due to factor productivity, infrastructure investment boosts UK economic development and employment. Petre and Ion (2019) examines how agricultural investments affect rural Romanian economies. This analysis examines the relationship between agricultural investments, GDP in largely rural areas, and agricultural production. The major findings support the idea that agricultural investment boosts rural economic growth.

Alfredo Marvão Pereira and Pereira (2019) show how 12 categories of infrastructure investment in Portugal affect economic activity by industry. For airport investments, ports, refineries, water, national highways, municipal roads, telecommunications, health, and education,

demand-side effects account for approximately 60% of overall effects. Second, site-location effects account for 30, 35, and 64% of the overall effects for national roads, highways, and railroads. Third, investments in non-traded goods and services produce macroeconomic impacts.

The examination of Pakistan's power and energy sector (PESP) and the causation between FDI, energy consumption, and economic growth from 1990 to 2017 is furnished. In recent years, Pakistan's power and energy business (also known as PESP) has attracted a greater amount of foreign direct investment than any other sector. The patterns of energy production and consumption have been trending in opposite directions for some years. In the short run, there is a positive and bidirectional causal relationship between rising economic output and rising energy consumption. The energy consumption equation exhibits long-run causation (Latief & Lefen, 2019).

The situation of investments in Infrastructure (Communication & Transport), Energy (Electricity & Gas), Manufacturing and Mining & Quarrying is pictured in the following figures. These figures explain the unstable patterns of investments in the most important sectors of Pakistan during 1990 – 2021 which depicts a serious condition of low economic performance in this region. The instability in economic performance may be observed by figure 5 and 6 in which trade openness and inflation are displayed. The fluctuations in trade openness and inflation may be associated with the fluctuations in investments in various sectors of Pakistan. It confirms that instability in economic performance of Pakistan is due to unstable investments in Infrastructure, Energy, Manufacturing and Mining sectors. Due to this situation in Pakistan, it is necessary to observe the linkage between sectoral investment and economic performance of Pakistan.

Figure 1:Communication & Transport

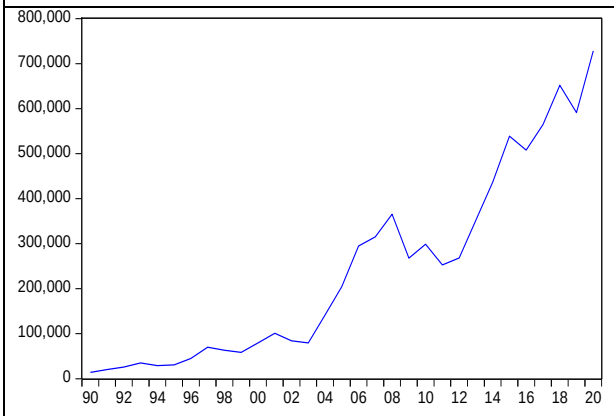

Figure 2: Manufacturing

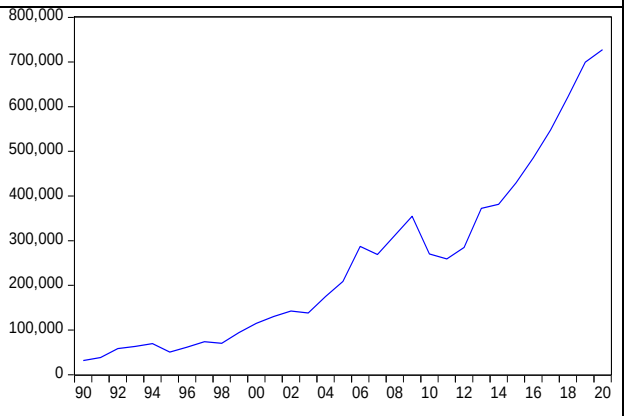

Figure 3: Electricity and Gas

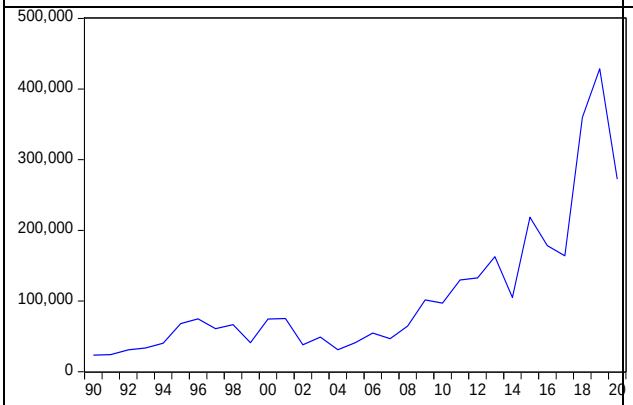

Figure 4: Mining and Quarrying

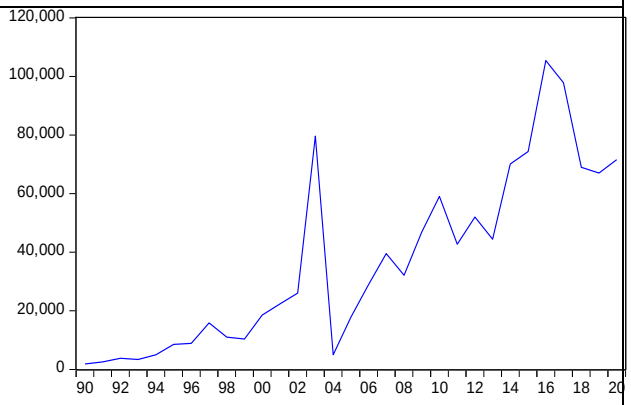

Figure 5: Trade Openness

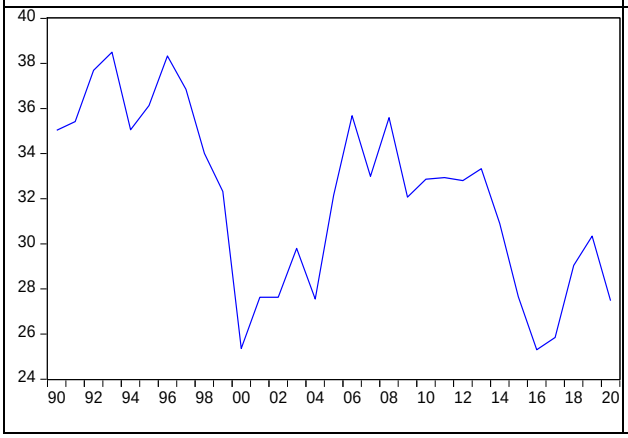

Figure 6: Inflation

The research question of the study is: What is linkage between Sectoral Investment and Economic Performance of Pakistan? To answer the question, this study explores the influence of sectoral investment (agricultural investment, manufacturing investment, infrastructural investment, energy investment and mining investment) on economic performance (GDP, GDP per capita, Price level-Inflation and Trade) of Pakistan. The study is organized into 5 sections in which 1st section is about Introduction to the study, 2nd section summarizes the previous literature, 3rd section gives description about data, technique and model, and results are discussed in 4th section while conclusion is drawn in 5th section.

2 Literature Review

A number of studies are available on investments in agriculture, industry and infrastructure observing relationship with economic growth. Few of them are presented and summarized in this section. Ibahimov, Hajiyeva, Seyfullayev, Mehdiyev, and Aliyeva (2023) examine how infrastructure investments boost economic growth. Consequently, economic expansion is due to gross domestic investment, investments in inland infrastructure, and investments in road infrastructure. Correlation analysis showed a direct association between economic growth indices and infrastructure investment in most nations, considering time lags that are statistically significant.

Nabay, Venkatesh, Jr, and Singh (2022) investigates Sierra Leone's 2001–2020 economic development and agriculture expenditure and investment. The study shows that agriculture investment boosts Sierra Leone's economy. The report suggests government investment in agriculture to boost economic growth. F. Bashir, Shah, Ahmad, and Naveed (2021) evaluate the impact of investment in several economic sectors on Pakistani exports from 1972 to 2018. The findings indicate that investments made in Agriculture and Manufacturing, Terms of Trade, and Human Capital all lead to an increase in Pakistan's exports, whereas investments made in Services and Transportation lead to a decline in those exports.

Jankulovski, Angelova, and Boshkoska (2021) link farm investment to GDP growth in North Macedonia. The ARDL co-integration test and yearly secondary time series data from 1991 to 2020 were utilised in this investigation in order to investigate both the long-term and short-term correlations that exist between dependent and independent variables. Throughout history, a positive and strong correlation can be drawn between the value added by agriculture and the expansion of GDP. There is a favourable correlation between agricultural land and GDP growth over the long run. Both in the long term and in the near term, agricultural methane emissions and inflation both have a negative impact on the growth of the GDP. Awan, Ahmad, Hussain, and

Marri (2021) showed that accelerated inflation has obstructed real output and reduced output levels has further caused jump in price levels during the investigated period.

How does infrastructure affects trade is examined by Rahman et al. (2021); Investments in mobile, electricity, and internet connections (ICT Communication infrastructure) have a strong and positive impact on trade, whereas investments in air transport and landline phone connections have an unexpectedly negative impact on trade. These two types of investments are referred to as "transport infrastructure" and "ICT Communication infrastructure," respectively. High-quality transport and ICT facilities improve trade flows for exporting and importing countries. Cultural closeness increases trade between China and Asia.

Apurv and Uzma (2020) examine infrastructure investment and economic growth in BRICS countries and found mixed outcomes. Brazil and South Africa's economic growth is unrelated to infrastructure development. Energy and transport infrastructure development boosts Russia's economy. India's economic growth is negatively correlated with development and telecommunication infrastructure investment, while China's is with transport infrastructure. The panel data reveal that investments in energy infrastructure and developments in energy infrastructure both contribute to economic growth; however, strong negative links exist between investments in communications infrastructure and developments in communications infrastructure.

This research uses socio-economic indices for African mineral-rich countries to measure socio-economic development. This poll found that African mining countries outperform oil-producing and non-mineral countries in human development and governance. Mining has spurred development in various nations. When the GINI coefficient development in mineral-rich nations is included (Ericsson & Löf, 2019). Hussain, Nawaz, and Ibraheem (2021) found that institutional governance affects GDP and as well as FDI negatively and validates the notion that corruption greases the wheel of growth but when institutional governance is used with other indicators of governance in the model, it affects the FDI positively. Khalil, Hussain, Bhatti, and Ibraheem (2022) are of the view that main factors in Pakistan's economic growth are trade openness and institutional quality.

Infrastructure investment and economic growth in Pakistan's industrial, agricultural, and services sectors are analysed in Javid (2019), which covers the time period from 1972 to 2015. Estimating the long-term association using fully modified ordinary least squares (FMOLS) takes into account the possibility of reverse causality. According to the findings of this study, public and private infrastructure investments contribute to economic growth in distinct ways. Thus, marginal productivities of private and governmental infrastructure investments vary by sector. Public infrastructure investment usually boosts economic growth more than private infrastructure.

D. F. Bashir (2018) examine how sectoral investment affects employment. Time series data of Pakistan is used from 1972–2017. Long-term data collected by ARDL reveal that factors such as agricultural investment, industrial investment, investment in the services sector, and trade openness all contribute to a rise in employment in Pakistan, but factors such as inflation and tax income contribute to a drop in employment. Ponce and Navarro (2016) examine how governmental and private investment in building and telecommunications infrastructure affected Mexican economic growth. First, infrastructure investment boosts economic growth, and private investment boosts it more than state investment. Atiq-ur-Rehman, Nasim, Ayub, and Ibraheem (2022) found that monetary policy takes 4 to 5 months to effect inflation in the country.

Mahonye and Mandishara (2015) examine how the extractive sector affects the economy of a country rich in minerals and metals from 1970 to 2008. According to empirical evidence, real

manufacturing growth, real mining growth, mineral export share to total exports, property rights, and political rights all have an effect on economic growth. Getu (2014) analyses Mekelle's private industrial investment's economic impact. Private industrial investment boosts the local economy and may lead to more research.

The article looks at the economic growth and infrastructural investments made in Mexico's major urban areas from 1985 to 2008. According to the evidence, investments in physical infrastructure have a positive effect on the economy over the long run. This suggests long-term impacts. The empirical estimations also take into account metropolitan areas' economic performance: Infrastructure-rich places grow faster. Conclusions show that inadequate infrastructure may limit expansion (German-Soto & Bustillos, 2014). In order to assess the implications of the mining boom on the Australian economy, Tulip (2014) employs a macro econometric model. The rise in the mining industry from 2003 to 2013 resulted in a 13% increase in the real disposable income of households. The boom boosted the Australian currency, hurting trade-exposed industries including manufacturing and agriculture. Alfredo M Pereira and Andraz (2013) review the latest research on public infrastructure investment and economic success. Public investment appears to effect long-term private-sector performance unevenly across industries and locations. It influences regional and industry mix and may lead to economic concentration in the major sectors and areas.

In the section of literature review, it has been observed that the effects of investment in many sectors of economies, such as agriculture, manufacturing, mining, and infrastructure, have been investigated numerous times; however, the researcher has been unable to locate very many studies that focus on Pakistan and this particular topic. Moreover, the effect of infrastructure has been explored on trade as well but not in Pakistan. Keeping in view the literature, it is necessary to explore the influence of agricultural investment, manufacturing investment, infrastructural investment, energy investment and mining investment on economic performance of Pakistan considering Nominal GDP, GDP per capita, Price level (inflation) and Trade in Pakistan using latest data set.

3 Data and Methodology

3.1 Data Description

In this study, time series data has been taken for 1990 to 2021. Data on Nominal GDP, GDP per capita, Investments in Agriculture, Mining and Quarrying, Communications & Transportation, Manufacturing and Electricity & Gas, are taken in rupees while Labor force is taken in millions and Inflation is taken in index form. For data collection, official sources are utilized like Handbook of Statistics on Pakistan Economy managed by State Bank of Pakistan and World Development Indicators (WDI) processed by World Bank Organization. For the purpose of analysis, ADF unit root test has been applied for examining unit root problem and then appropriate technique will be decided like having all variables integrated of order 0 (At Level) will lead towards application of Regression Analysis, having all variables integrated of order 1 (At 1st Difference) will lead towards application of Johansen Cointegration Analysis, having few variables integrated of order 0 & 1 (At Level and 1st Difference) will lead towards application of Autoregressive and Distributed Lag (ARDL) technique.

3.2 Model Specification

To justify the objectives of the study that is to examine the consequence of various sectoral investments on the economic performance of Pakistan, the following models are proposed considering Nominal GDP, GDP per capita and Inflation as a measure of economic performance. Solow growth model has been followed in this study so labor and capital have been taken. The general form of the model is given below;

$$Economic\ Performance = \left\{ \begin{matrix} Labor\ Force, Investment\ in\ Agriculture\ Sector, \\ Investment\ in\ Manufacturing\ Sector, \\ Investment\ in\ Infrastructure\ Sector, \\ Investment\ in\ Energy\ Sector, \\ Investment\ in\ Mining\ and\ Quarrying \end{matrix} \right\}$$

The above function form model may be written for Nominal GDP, GDP per capita and Inflation considering dependent variables in equation forms.

GDP = α_0+α_1 LBR+α_2AGRIN+α_3MNFIN+α_4CMTRIN +α_5ECGSIN+α_6MNQRNIN +ε_2

GDPPC = β_0+β_1 LBR+β_2AGRIN+β_3MNFIN+β_4CMTRIN +β_5ECGSIN+β_6MNQRNIN +ε_1

INF =γ_0+γ_1 LBR+γ_2AGRIN+γ_3MNFIN+γ_4CMTRIN +γ_5ECGSIN+γ_6MNQRNIN +ε_3

TRD =c_0+c_1 LBR+c_2AGRIN+c_3MNFIN+c_4CMTRIN +c_5ECGSIN+c_6MNQRNIN +ε_4

In these equations, GDP is log of Nominal GDP, GDPPC is log of GDP per capita, INF is log of Consumer Price Index, TRD is log of trade openness, AGRIN is log of Agriculture investment (Capital Formation of Agriculture), LBR is log of Labor force, MNFIN is log of Manufacturing investment (Capital Formation of Manufacturing), MNQRNIN is log of Mining and quarrying investment (Capital Formation of Mining and Quarrying), CMTRIN is log of Communication and transport investment (Capital Formation of Communication and Transportation) and ECGSIN is log of Electricity and gas investment (Capital Formation of Electricity and Gas).

Table 1
Description of Variables

Variables	Description	Unit of measurement	Nature of Variable	Source of data
GDP	Nominal GDP	Rupees	Dependent Variables	World Development Indicators processed by World Bank Organization (World-Bank, 2022)
GDPPC	GDP per capita	Rupees		
INF	Consumer Price Index	Price Index		
TRD	Trade Openness	Trade Index		
LBR	Labor force	Rupees	Independent Variables	Handbook of statistics on Pakistan Economy managed by State Bank of Pakistan (State-Bank-
AGRIN	Capital Formation of Agriculture	Rupees		
MNFIN	Capital Formation of Manufacturing	Rupees		
CMTRIN	Capital Formation of	Rupees		

	Communications and Transport		of-Pakistan, 2020)
ECGSIN	Capital Formation of Electricity and Gas	Rupees	
MNQRNIN	Capital Formation of Mining and Quarrying	Rupees	

4 Results and Discussion

4.1 Unit Root Test

Table 2 presents the ADF unit root test for deciding about the appropriate technique and the results explain that Current GDP, GDP per capita, Trade, Investments in Agriculture, Manufacturing, Infrastructure, Energy and Labor force are stationary at 1st difference and Consumer Price Index (Inflation) and Investment in Mining are stationary at level. So, it is decided to apply ARDL technique for short-run and long-run relationships.

Table 2
ADF unit root test

Variables	Unit Root test at	Including test	t-Statistics	Probability	Result
Nominal GDP	Level	Intercept	-1.95	0.31	I(1)
		Trend and intercept	-1.14	0.91	
	1st difference	Intercept	-5.37	0.00	
GDP per capita	Level	Intercept	-1.695	0.43	I(1)
		Trend and intercept	-1.35	0.85	
	1st difference	Intercept	-5.52	0.00	
Consumer Price Index	Level	Intercept	-2.16	0.22	I(0)
		Trend and intercept	-3.97	0.03	
Trade	Level	Intercept	-1.82	0.36	I(1)
		Trend and intercept	-2.39	0.38	
	1st difference	Intercept	-5.45	0.00	
Labor Force	Level	Intercept	-1.76	0.39	I(1)
		Trend and intercept	0.38	0.99	
	1st difference	Intercept	-1.31	0.61	
	1st difference	Trend and intercept	-4.23	0.01	
Investment in Agriculture	Level	Intercept	-0.85	0.79	I(1)
		Trend and intercept	-2.10	0.53	

	1st difference	Intercept	-5.03	0.00	
Investment in Manufacturing	Level	Intercept	-1.12	0.69	
		Trend and intercept	-2.85	0.19	I(1)
	1st difference	Intercept	-5.46	0.00	
Investment in Infrastructure (Communication Transport)	Level	Intercept	-1.58	0.48	
		Trend and intercept	-2.58	0.29	I(1)
	1st difference	Intercept	-4.87	0.00	
Investment in Energy (Electricity and Gas)	Level	Intercept	-1.25	0.64	
		Trend and intercept	-2.65	0.26	I(1)
	1st difference	Intercept	-7.27	0.00	
Investment in Mining-Quarrying	Level	Intercept	-1.97	0.31	I(0)
		Trend and intercept	-4.66	0.00	

4.2 ARDL Bound Test

ARDL Bound testing approach is used to assess the cointegrating relationship among the variables. The criteria of having cointegrating relationship or long-run relationship is that calculated value of F-statistic should be greater than then value of I1 Bound (upper bound). In table 4, the results of ARDL bound test concerning the models of this study are given at various levels of significance. Table 3 describes that cointegrating or long-run relationships exist in Nominal GDP model, GDP per capita model, Inflation model and trade model with all explanatory variables at 1 percent level. So, the next step is to compute the long-run and short-run coefficients.

Table 3
ARDL Bound test

Test Statistic	**Nominal GDP model**		**GDP per capita model**		**Inflation model**		**Trade Model**	
	Value	**K**	**Value**	**K**	**Value**	**k**	**Value**	**K**
F-statistic	4.939317	6	11.68182	6	17.16567	6	3.915104	6
Critical Value Bounds	**I0 Bound**	**I1 Bound**	**I0 Bound**	**I1 Bound**	**I0 Bound**	**I1 Bound**	**I0 Bound**	**I1 Bound**
10%	2.12	3.23	2.12	3.23	2.12	3.23	2.12	3.23
5%	2.45	3.61	2.45	3.61	2.45	3.61	2.45	3.61
2.50%	2.75	3.99	2.75	3.99	2.75	3.99	2.75	3.99
1%	3.15	4.43	3.15	4.43	3.15	4.43	3.15	4.43

4.3 ARDL Long-run Results

The results of ARDL long-run concerning Nominal GDP, GDP per capita and Inflation are portrayed in table 4. Considering Investment in Agriculture sector, it is observed that this has been the source of higher Nominal GDP, GDP per capita and trade in Pakistan in the long-run with highly statistically significant probability values. There have already been conclusions established

by Nabay et al. (2022), Jankulovski et al. (2021), Petre and Ion (2019) that are comparable to this considering economic growth as dependent variable. This is a genuine to explain that if expansion of agriculture sector is ensured by increasing investment in this sector so the stable economic growth can be achieved hence higher GDP, GDP per capita & trade can also be attained. However, a higher level of investment in the agricultural sector can also lead to an increase in inflation as a result of an increased demand for products and services across the economy as a whole. This is matched with earlier study of F. Bashir et al. (2021) having exports as dependent variable.

In any economy, investment in infrastructure may be kept on top priority to accelerate the economy in the long-run so this study also incorporates the investment in Communication and Transportation sector. If these sectors are focused and investment is ensured so stable economic growth may be attained. Construction of roads will engage the unskilled, semi-skilled and skilled labor force of Pakistan and various sectors associated with construction industry will also be accelerated causing the boom in the economy. There have already been conclusions established by (Apurv & Uzma, 2020; Du et al., 2022; German-Soto & Bustillos, 2014; Ibahimov et al., 2023; Javid, 2019; Ponce & Navarro, 2016; Seidu et al., 2020) that are comparable to this considering economic growth as dependent variable. Investment in communication sector will also engage skilled and semi-skilled labor of Pakistan towards the development of society. This study examines the similar findings in case of Pakistan having positive and highly statistically significant coefficient value suggesting that Nominal GDP, GDP per capita and trade will increase by 0.36, 0.34 & 0.48 percent respectively if investment in infrastructure increases by 1 percent in the long-run. The effect of infrastructural investment on trade has already been examined by Rahman et al. (2021).

As the economy of Pakistan is facing energy crisis due to low production of electricity so there is a need to increase the investment in this sector. Availability of cheap and excessive energy in Pakistan will ultimately be a source higher GDP per capita and trade. Due to this, energy prices may reduce and cheap energy will lower the cost of production and hence lower inflation as well. This study also come up with the same findings as the coefficients of investment in energy are positive in Nominal GDP, GDP per capita and trade models but the coefficient of Nominal GDP model is statistically significant. On the other side, its coefficient in Inflation model is negative and statistically highly significant proposing the same conclusion as discussed.

It is generally agreed that the manufacturing sector is the most essential part of the economy in terms of ensuring long-term economic growth. If this sector is developed so there will be excessive production of goods and services and employment will be created, growth will be attained, GDP per capita and trade will be higher. If goods and services are produced in the economy so their prices may be controller so there will be lower inflation. This study also postulates the negative relationship between investment in manufacturing sector and Consumer Price Index but its positive effect on Nominal GDP, GDP per capita and trade in the long-run. This is matched with the findings of earlier study of F. Bashir et al. (2021)having exports as dependent variable. The correlation between financial investments in manufacturing and expansion of the economy has already been investigated by Getu (2014).

Another smaller part of the economy is the Mining sector which turns out to be positive with Nominal GDP and GDP per capita in the long-run while negative with Consumer Price Index and trade. The linkage of Mining, minerals and metals with economic growth have been observed by Mahonye and Mandishara (2015) and Tulip (2014). Like other variables, Labor force has been one of the important factors that may improve the economic growth of the economy in the long-run. It is considered as the endogenous variable for the growth. If labor force is actively participating in the production of goods and services, so there may be higher production levels, higher GDP and higher GDP per capita.

Table 4
ARDL Long-run

Variable	Nominal GDP		GDP per Capita		Inflation		Trade	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
Investment in Agriculture	0.15	0.01	0.14	0.02	1.91	0.00	0.11	0.09
Investment in Infrastructure	0.36	0.02	0.34	0.03	4.05	0.00	0.48	0.00
Investment in Energy	0.11	0.02	0.08	0.12	-1.89	0.00	0.02	0.69
Investment in Manufacturing	0.17	0.17	0.23	0.09	-1.32	0.01	0.53	0.01
Investment in Mining	0.28	0.00	0.27	0.01	-3.31	0.00	-0.22	0.00
Labor Force	3.25	0.00	2.88	0.00	-14.87	0.01	-0.42	0.49
Constant	-30.25	0.00	-41.19	0.00	221.29	0.01	12.77	0.19

4.4 ARDL Short-run Results

Table 5 expresses the short-run coefficients relevant to different models in which the most important is the cointegrating term. These terms for Nominal GDP is -0.67, for GDP per capita is -0.22, for Inflation is -0.52 and for trade it is -0.67 proposing the convergence towards long-run equilibrium with statistically significant values.

Table 5
ARDL Short run

Variable	Nominal GDP	GDP per Capita	Inflation	Trade
	Coefficient	Coefficient	Coefficient	Coefficient
D(GDPPC(-1))	----	-1.54**	----	----
D(INF(-1))	----	----	-1.14	----
D(AGRIN)	0.10***	0.16**	22.44*	0.11**
D(AGRIN (-1))	----	0.25**	35.97*	----
D(AGRIN (-2))	----	-0.02	31.38	----
D(CMTRIN)	-0.01	0.08	-18.44	-0.01
D(CMTRIN (-1))	0.09*	0.18*	30.94	0.09*
D(CMTRIN (-2))	-0.19***	0.05	131.71*	-0.19***
D(ECGSIN)	-0.02	0.04	-7.55	-0.02
D(ECGSIN (-1))	-0.07**	0.02	52.42	-0.07**
D(ECGSIN (-2))	-0.04	-0.02	50.58*	-0.04
D(MNFIN)	-0.16**	0.13	91.81*	-0.16**

D(MNFIN (-1))	0.10*	-0.05	-97.99	0.11*
D(MNFIN (-2))	-0.13**	-0.35**	49.41	-0.13**
D(MNQRNIN)	-0.04**	-0.02	51.69	-0.04***
D(MNQRNIN (-1))	0.09***	----	-61.52*	0.09***
D(MNQRNIN (-2))	----	----	-6.37*	----
D(LBR)	2.18**	-1.05	-946.14*	2.18**
D(LBR (-1))	----	-1.01	966.41	----
D(LBR (-2))	----	4.93**	-1654.01*	----
CointEq(-1)	-0.67***	-0.22**	-0.52*	-0.67***

Note: In this table, *** shows this coefficient to be highly significant at 1%, ** shows the coefficient to be significant at 5% and * shows the coefficient to be weakly significant at 10%.

5 Conclusion & Policy Recommendations

The purpose of this study is to investigate the impact that numerous types of economic investments have had on Pakistan's overall economic performance. This study comprehends Nominal GDP, GDP per capita, Inflation and trade as a proxy of economic performance. For sectoral investments, investments in Agriculture, Manufacturing, Communication & Transportation, Electricity & Gas and Mining & Quarrying are taken in the paper. The time series data on these variables has been taken from Handbook of Statistics on Pakistan Economy and World Development Indicators ranging from 1990 to 2021. The analysis is made through ADF unit root test and ARDL technique.

The results of ADF unit root explicate that Nominal GDP, GDP per capita, Trade, Investments in Agriculture, Manufacturing, Infrastructure, Energy and Labor force are stationary at 1st difference and Consumer Price Index (Inflation) and Investment in Mining are stationary at level. So, it is decided to apply ARDL technique for long-run relationships. ARDL Bound testing approach describes that F-statistic is greater than then value of I1 Bound (upper bound) so there exist cointegrating relationships in Nominal GDP model, GDP per capita model, Inflation model and Trade model with all explanatory variables. The results of ARDL long-run express that Investment in Agriculture sector, Infrastructure, Energy, Manufacturing and Mining are a source of higher Nominal GDP and GDP per capita in the long-run. Labor force has been positive for growth but negative with price level.

On the other hand, investments in agriculture and infrastructure may increase the price level of the economy but investment in energy, manufacturing and mining may reduce the price level in the long-run. Labor force also turns out to reduce price level by enhancing the output levels. For trade model, Investments in Agriculture, Manufacturing, Infrastructure and Energy have been turned out to increase trade of Pakistan while investment in mining and labor force have been reducing factors for trade.

On the basis of results, it is suggested to enhance the investment opportunities in various sectors of the economy like Agriculture, Industry, Infrastructure, and Energy so that there would be expansion in the economic performance of Pakistan in the long-run.

References

Apurv, R., & Uzma, S. H. (2020). The impact of infrastructure investment and development on economic growth on BRICS. *Indian growth and development review, 14*(1), 122-147.

Atiq-ur-Rehman, M., Nasim, I., Ayub, M., & Ibraheem, R. (2022). Transmission Lags of Monetary Policy: Probing into Pakistan's Untamed Inflation. *iRASD Journal of Economics, 4*(2), 329-336.

Awan, A., Ahmad, H. K., Hussain, A., & Marri, M. Y. K. (2021). Prices, Money Supply and Output Nexus in Pakistan–A Macro Econometric Model. *iRASD Journal of Economics, 3*(2), 106-118.

Bashir, D. F. (2018). Sectoral Investment and Employment Generation in Pakistan: An Econometric Analysis. *Review of Economics and Development Studies, 4*(2), 261-270.

Bashir, F., Shah, S. Z. A., Ahmad, R., & Naveed, T. (2021). Sectoral Investment and Trade in Pakistan: An Empirical Analysis. *Journal of Business and Social Review in Emerging Economies, 7*(3), 801-808.

Benfica, R., Cunguara, B., & Thurlow, J. (2019). Linking agricultural investments to growth and poverty: An economywide approach applied to Mozambique. *Agricultural systems, 172*, 91-100.

Du, X., Zhang, H., & Han, Y. (2022). How does new infrastructure investment affect economic growth quality? Empirical evidence from China. *Sustainability, 14*(6), 3511.

Ericsson, M., & Löf, O. (2019). Mining's contribution to national economies between 1996 and 2016. *Mineral Economics, 32*(2), 223-250.

German-Soto, V., & Bustillos, H. A. B. (2014). The nexus between infrastructure investment and economic growth in the Mexican urban areas. *Modern Economy, 5*(13), 1208.

Getu, H. B. (2014). *Impact of Private Manufacturing Investment on Local Economy: A Case Study at Mekelle zone.* Mekelle University,

Han, X., Su, J., & Thia, J. P. (2021). Impact of infrastructure investment on developed and developing economies. *Economic Change and Restructuring, 54*(4), 995-1024.

Hussain, A., Nawaz, M. A., & Ibraheem, R. (2021). Governance, Real Output and Foreign Direct Investment in Asia: A Panel Data Analysis. *ANNALS OF SOCIAL SCIENCES AND PERSPECTIVE, 2*(2), 323-343.

Ibahimov, Z., Hajiyeva, S., Seyfullayev, I., Mehdiyev, U., & Aliyeva, Z. (2023). The Impact of Infrastructure Investments in the Country's Economic Growth.

Jankulovski, N., Angelova, B., & Boshkoska, M. (2021). An Empirical Relationship between Agriculture Investment and Economic Growth in North Macedonia: An ARDL Analysis. *TEM JOURNAL-Technology, Education, Management, Informatics, 10*(3), 1470-1475.

Javid, M. (2019). Public and private infrastructure investment and economic growth in Pakistan: An aggregate and disaggregate analysis. *Sustainability, 11*(12), 3359.

Khalil, A., Hussain, A., Bhatti, M. A., & Ibraheem, R. (2022). An analysis of the interrelationship among trade openness, institutional quality and economic growth: Empirical evidence from Pakistan. *Pakistan Journal of Humanities and Social Sciences, 10*(3), 1165–1179-1165–1179.

Latief, R., & Lefen, L. (2019). Foreign direct investment in the power and energy sector, energy consumption, and economic growth: Empirical evidence from Pakistan. *Sustainability, 11*(1), 192.

Mahonye, N., & Mandishara, L. (2015). Mechanism between mining sector and economic growth in Zimbabwe, is it a resource curse. *Economic Research Southern Africa (ERSA) Working Paper, 499*.

Nabay, O., Venkatesh, P., Jr, R. B., & Singh, D. R. (2022). Impact of Agricultural Investment in the Economic Growth of Sierra Leone (2001-2020). *American Journal of Economics, 12*(1), 1-5.

Pereira, A. M., & Andraz, J. M. (2013). On the economic effects of public infrastructure investment: A survey of the international evidence. *Journal of economic development, 38*(4), 1-37.

Pereira, A. M., & Pereira, R. M. (2019). How does infrastructure investment affect macroeconomic performance? Evidence from Portugal. *Journal of infrastructure development, 11*(1-2), 14-40.

Petre, I. L., & Ion, R. A. (2019). The impacts of the investments in agriculture on economic growth in rural communities in Romania. *Економика пољопривреде, 66*(4), 955-963.

Ponce, L., & Navarro, R. P. (2016). Effect of public-private infrastructure investment on economic growth. *Network Industries Quarterly, 18*(2), 10-12.

Rahman, I. U., Shafi, M., Junrong, L., Fetuu, E. T. M., Fahad, S., & Sharma, B. P. (2021). Infrastructure and trade: An empirical study based on China and selected Asian economies. *SAGE Open, 11*(3), 21582440211036082.

Sastra, E., Damanhuri, D. S., Achsani, N. A., & Yustika, A. E. (2021). Impact of agricultural sector investment development on national economic output. *Technium Soc. Sci. J., 26*, 466.

Seidu, R. D., Young, B., Robinson, H., & Michael, R. (2020). The impact of infrastructure investment on economic growth in the United Kingdom. *Journal of Infrastructure, Policy and Development, 4*(2), 217-227.

State-Bank-of-Pakistan. (2020). *Handbook of statistics on pakistan economy*. Retrieved from

Tulip, P. (2014). The effect of the mining boom on the Australian economy. *RBA Bulletin, December*, 17-22.

World-Bank. (2022). *World development report 2005: a better investment climate for everyone*: The World Bank.