An Analysis of Private Investment in Economic Growth in Three Major Sectors of Pakistan

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Abstract
Investment is the edition in the stock of existing capital. This study especially focuses on private investment. Private investment plays a very crucial role in the determination of economic growth and poverty reduction in any economy. Private investment has both short and long-run implications for the economy. A country, in which private investment is well established, is more stable than a country with low private investment. This research aimed to determine the impact of private investment on the economic growth of three different sectors of Pakistan Agriculture, Manufacturing and Service Sectors. The study contains annual time series data (i.e., from 1975 to 2021 from an economic survey of Pakistan), on selected parameters such as private investment and GDP growth rate in different sectors of the economy. Augmented Dickey-Fuller (ADF) test results and the Vector Auto Regressive Model (VAR) were applied for estimations. The result suggested that economic growth increases positively with private investment. VAR estimation data indicates that private investment has a positive and significant impact on the service sector and a negative and significant impact on manufacturing. Based on the study results, Pakistan has to boost sustainable growth in the private sector, which led to increased economic growth.

Keywords: Vector Autoregressive Model (VAR); Private Investment; Time Series Data, Economic Growth; Pakistan

1. Introduction
Investment is one of the most essential elements in the economy. It is a vital part of any economy. Investment helps decrease unemployment in the country and generates capital accretion for the economy. Keynes forms the basis of understanding the concept of investment, which is the addition of capital equipment. Investment is of two main types: private investments and public investments. These types impact a country's economic growth and social conditions differently. Yescombe (2007) explains public and private investment as "private Investment or public Investment; it may be induced or autonomous. Induced investment is an investment that changes with a change in income. That is why it is called income elastic. Autonomous Investment is independent of variations in output.
It is independent of profit considerations. Generally, it is a public investment". For the long-term economic growth of any country, increasing productivity is essential. Investment plays a significant role in enhancing production capacity (Bernanke, 2006). Unfortunately, the investment ratio in Pakistan is low compared to other countries; in fact, gross capital formation in Pakistan is low compared to other emerging South Asian countries, like India and Bangladesh. Private investment is essential for developing countries and their economic growth; a study conducted by Morrissey (2012) on the world's developing countries indicates that most developing countries are facing the problems of unemployment, low levels of production, poverty, and budget deficit. Din (2006) reveal a positive relationship between private investment and economic growth. German (2016) research on different developing countries also mentions the importance of private investment. Research designates that the development at the local level or residents is increasing through the private sector by increasing employment, opportunities for business, and social services, which increases the residents' confidence in business.

The study provides fresh evidence for identifying the impact of private investment on economic growth. The study contributes to the Investment-economic Growth nexus in a good way. The primary research gap identified in this study pertains to the evident disparity in private investment favouring the service sector over the manufacturing and agricultural sectors, despite the latter being the largest among the three. The main research gap in this study is the clear finding that private investment is higher in the service sector compared to the manufacturing and agricultural sectors, despite agriculture being the largest sector among the three. The study provides fresh evidence to identify the impact of Private investment on economic growth in different sectors. This study applies the latest empirical methodology, VAR, and provides new empirical evidence for private investment in Pakistan's economy. The study is one of the comprehensive types of research that provides much-needed insight into private investment in the developing economy.

Moreover, the study is divided into different parts. Part one provides substantial international and national research studies by different scholars on the relationship between private investment and economic growth. After the literature review, the main objective and hypothesis are given along with the methodology, in which a brief introduction of the different sectors of the Pakistan economy is given. The third portion provides data analysis of the economic growth of three sectors of the economy and private investment. The last part provides the conclusion and recommendation based on empirical findings.

2. Literature Review
Ahmed (1999) point out that the central issue of the agricultural sector of Pakistan is less private investment. Furthermore, Researchers explored that in Pakistan, agricultural sector investment was from the public sector; in 1980, private investment increased but less than the public sector, and productivity in the agriculture sector is not increasing significantly, so there is a dire need for private sector investment in the research area is essential for the agricultural sector of Pakistan. Furthermore, the researcher concluded that for private investment, stable politics and a stable economy are as important as accessible and transparent rules and regulations. The bad rule of law, violence, and corruption are also the main hindrances to the growth of agricultural products, both nationally and internationally. One example of an international study by Arial Denar (1996) explores the importance of good governance for sustainable growth in the agriculture sector; in this regard, the researcher explored research that violence in Colombia demonstrated as detrimental to the agricultural sector. In

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1 The Soviet Union, officially the Union of Soviet Socialist Republics (USSR), was a federal socialist state in Northern Eurasia from 1922 to 1999.
Colombia’s irrigation system, production turns out to be less due to dreadful running and erroneous exploitation of water, which creates a deficiency of interest among investors in the agricultural sector. This study confirms that good and transparent management of water resources is essential for the sustainable growth of the agricultural sector of any country, and the public sector needs to provide such facilities—research by Robert I. Crouch (1772) on the agriculture sector of Pakistan showed that private investment is meagre compared to public investment, and due to less private investment, returns on production are meagre.

However, Pakistan has a good amount of input, but more output is needed. Pakistan’s agricultural production is small compared to that of other nations such as India, Egypt, and other lower-income countries. Research also mentioned that in the era of 1980, quite an increase in private investment increased productivity, which is also lower than the other countries of the same group. The researcher concluded that increasing the infrastructure is not only a solution, but quality enhancement is significant for increasing productivity. Lorie (2006) explored in their research that market mechanisms, market distortions, government intervention, and lack of competition are the major problems in the agricultural sector in Pakistan.

Furthermore, another researcher, Amjad (2011), highlights the challenges and problems in Pakistan's agricultural sector. Among many vital issues, one of the critical problems is government intervention in the price mechanism. The researcher mentioned the government policy in 2008 that the price of wheat and sugar fixed by the government was at a lower rate than the international market price. After fixing the price, the resulting consequence was that sugar disappeared from the local market, either smuggled or stored, which ended in an excellent price hike of sugar in the local market. However, the researcher also mentioned that with this problem, if the government does not fix the prices, it generates poverty, and poor people in urban areas also suffer from the higher prices. So, proper research is critical, which is also the main problem highlighted by the researchers. Researchers suggest that the government must take examples from other countries while making policies regarding the agriculture price mechanism; proper applied research is also essential because, in Pakistan's agriculture sector, only some private organisations are doing applied research. For poverty reduction, new techniques and equipment should be used in livestock, fisheries, and the forest sector; for example, Pakistan is the largest milk producer, but the methods for collecting and storing milk are old or traditional. Private companies are essential in investing in dairy products to increase the returns on the products.

Another researcher, Khan (2012), declares that though the agricultural sector growth of Pakistan increased by its target, it is still far behind the South Asian countries, especially India, China, and Bangladesh. Pakistan's production is not satisfied because it needs to meet the country's necessities; the researcher mentioned the decreasing production of crops per capita availability. A study by M. Usman (2016) demonstrates that agricultural production in Pakistan has decreased due to traditional production and storage methods. All these problems indicated the dire need for investment in the agricultural sector of Pakistan; the government’s role in the agricultural sector is to facilitate private investment by which new techniques, methods and skills are introduced in this field, which does not only produce more income generation but also for the issue food security. According to Hussain (2012), the livestock sector plays a significant and positive role in the socio-economic condition of the people of rural areas of Pakistan. Unfortunately, Pakistan's livestock sector has faced problems of lack of new technical equipment and decisive decisions or ruined government policies, which hinder efficient production. According to World Bank data, in 2017, livestock sector production in Pakistan was 136.328, which is not significantly increasing. Other researchers have highlighted the lack of sound production in Pakistan's livestock sector. According to Hasnain (2006),
the livestock sector of the Pakistani economy is facing many problems, including health issues, a lack of proper investment issues, good marketing, and a lack of new and modern techniques. The livestock sector needs proper investment for introducing new and modern techniques by which production can increase; for example, old methods of milk collection and inadequate transportation for milk and other dairy products have adverse effects on livestock resources, and technical and skilled human resources are significant. Furthermore, another research by Rubina Aziz (2017) suggested that private investment increases the productivity of the poultry industry by using modern ways to enhance the quality of products and price settlement competition. According to Muhammad Asif Hassan (2016), Pakistan's deforestation rate is 1.1. Furthermore, researchers have reported that 55,000 hectares of forest are demolished annually, which harms the country. Causes of deforestation, according to M. Hassan (2016), are wood used for construction purposes, different ways of employment, ownership of resources, no substitutes for energy resources, the wood used as fuel for cooking and other purposes, no cooperation between locals and forest department officials, changes in land for agricultural and urbanisation, exploitation of the forest resources, forest fire, high demand of timber, limited finance, and lack of technical and skilled human resources. Furthermore, Andrew Rina et al. (2018) also investigated the role of national forest conservation programs NFCP in China for reforestation and increasing investment in the timber industry for the benefit of locals; the study suggests the positive relationship of NFCP with foreign gains. Furthermore, the researcher also mentioned that the other grain-to-green programs positively impact the production of forest goods and reforestation by growing new trees. The OECD report (2014) also mentioned the role of investment in forestry in promoting economic growth in the country; research finds that the implementation of forest instruments for ecological protection and restoration and increased investment in forest tourism imply a positive impact on China's income, total investment in forestry increases 64.575 billion in 2007 to 378.227 billion in 2013. The increase in China's forestry investment is due to domestic, private, and foreign investors.

A study on the forest sector of developing economies by the United Nations (2000) found that the demand for forest products increased daily, and the alarming fact is that production is less than the demand. So, most developing countries import forest products to meet nations' demands and import forest items to increase the country's budget deficit and decrease economic growth. Therefore, it is essential to increase forest production, especially timber. However, reforestation will also be the main focus of the firms or industries while making value-added products for the forest sector; sustainable forest management is essential SFM for good, sustainable forest management in developing countries' finance. If the government alone provides this finance, it must take a loan of aid, which will also increase the debt burden on the country. Here, researchers suggest that private investment is essential for financing the SFM. A study by Boscolo (2012) proved that private investment is significant for forestry in developing countries, as it is the primary and significant source of finance for good forest management. Furthermore, the researcher found out the reason why private investment is suitable for forestry by using the 23 articles of the different countries regarding the need for private investment; the researcher concluded that good forest management needs finance for efficient investment, but most of the developing countries are facing the problem of high debts. So that is why the state cannot manage the forestry department alone; developing countries need private investment for increased value-added production, but the government also implements a reforestation policy through regulation on the private sector; the researcher further explained the regulations for growing more trees.

It is a fact that forests play a significant role in the socio-economic conditions of any country; Pakistan is blessed with a total area of forest of 4.5%, which is quite enough to meet the demand of...
the nation, but due to the lack of proper utilisation of resources of forest in Pakistan, resources not only becomes scares day by day but devastating the whole environment of the country also besides other issues of food insecurity, unemployment, disturb biodiversity, wastage of resources.

Noor Ahmed Memon (1999) mentioned that most of the fish produced are exported from the country, and the consumption of seafood per capita is 2.0, less than the other developing countries. Furthermore, researchers point out the reasons behind the low fish production in Pakistan are a need for more institutional faculty, a shortage of fish seeds of cultural speeches, and a lack of basic knowledge of fish forms. Moreover, the study's recommendation is to focus on the importance of private investment in the fisheries sector of Pakistan; private investment needs good water management, for example, a better canal system at lower prices and a supply of seeds at an average rate Amin Ahmed (2018) recognises that the fish production in Pakistan is not only less, but the quality of fish produced in the country is not suitable to meet the demand of the international market; Pakistan exports fish to China, Malaysia, Thailand, the Middle East, Sri Lanka, and Japan. However, European countries and the United States do not buy Pakistani fish due to its low quality. Researchers found that the only solution for better performance of fisheries in Pakistan is a public-private partnership. ACCA report (2010) mentioned that SMEs are the source of improving human capital and increasing technological capital. SMEs must obtain greater importance in Pakistan because, compared to the international market, Pakistan has meagre growth in small-scale manufacturing, as data in World Bank Indicators 2017 illustrated that large-scale manufacturing is 150.18 % compared to 7.69 of small-scale manufacturing. Because of low private investment in the manufacturing sector, private investment plays a significant positive role in the growth of the manufacturing sector.

Moreover, the researcher used the regression analysis for empirical analysis of the role of private power plants in the electricity industry of Pakistan and public power plants in the electricity industry of Pakistan; the result of the study found that public plants in the electricity industry of Pakistan are less efficient than the private power plants of the electricity industry. Furthermore, research by Zuberi (2008) and Ahmed (1999) explored the need for power generation in Pakistan. Electricity is essential, and with it, the country can increase its economic growth. Furthermore, the researchers concluded that the government cannot meet the electricity demand, but it should create opportunities for private investors to invest in electricity.

In Pakistan, about 70 per cent of the general public seeks health from the private sector, and for the public sector, the ratio is just over 20 per cent; the primary reason behind this low government services utilisation is the poor performance of the public sector, and another study suggested that the failure of the public sector in health care system of Pakistan is policy issues such as government spending on the health system are only for a curative purpose not on the preventive side which creates an opportunity for the private sector to fill the gap in services, which the public sector cannot provide, and issues like poverty or out-of-pocket spending may be solved through universal health coverage insurance (Javaid, 2019). Investment has been an engine of growth since the time of Adam Smith and Karl Marx. It is essential to study investment because it is the primary tool of economic growth. It is concluded from the literature review that Pakistan's different sectors are facing many problems which hinder economic growth in the different sectors of the economy, and some international and national research also supports private investment to enhance the economic growth of the country.

3. Objective
To explore the impact of private investment on the economic growth of different sectors of Pakistan.
4. Hypothesis
1. Private investment significantly impacts the economic growth of Pakistan’s agricultural sectors.
2. Private investment significantly impacts the economic growth of Pakistan’s manufacturing sectors.
3. Private investment significantly impacts the economic growth of Pakistan’s service sectors.

5. Research Methodology
This study aims to provide information on the relationship between private investment and different sectors of the economy, so the study model is given along with a brief introduction to private investment and different sectors of the economy.

We have taken time series annual data of 53 years from 1976 to 2022 (data has been taken from 1972 to 2022 because of the main structural breakdown of east and west Pakistan separation. Data is collected from the Economic Survey of Pakistan, 2022. Different techniques have been used to analyse the data, like Eviews 10 and MS Excel. This study has used Augmented Dickey-Fuller (ADF) to check the stationarity of data. According to the result of stationary data, the VAR approach has been used to analyse the relationship between the variables. The Vector Autoregression model is a statistical model that describes the evolution of a multivariate linear time series with k endogenous variables. The evolution of these endogenous variables in the system is considered not only as a function of their history but as a function of the lagged values of all endogenous variables.

Model of Private Investment and different sectors of the economy

\[ I_{PRI} = f (Agr_{GDP} + Man_{GDP} + Ser_{GDP}) \]

In functional form

\[ \Delta I^{PRI} = \alpha + \sum_{i=0}^{P1} \alpha \Delta PRI_{A t-1} + \sum_{i=0}^{P2} \alpha \Delta Agr_{A t-1} + \sum_{i=0}^{P3} \alpha \Delta Man_{A t-1} + \sum_{i=0}^{P4} \alpha \Delta Ser_{A t-1} \]

\[ I_{PRI} = \text{Private investment} \]
\[ Agr_{GDP} = \text{GDP growth rate in the agricultural sector} \]
\[ Man_{GDP} = \text{GDP growth rate in the manufacturing sector} \]
\[ Ser_{GDP} = \text{GDP growth rate in the service sector} \]

6. Private Investment
According to Abell (1997), private investment is not an investment from the government but the investment of private businesses and private financial organisations. Private investment involves small groups or individuals (Richaell, 1987). As per famous researcher Schlesinger (956), private domestic investment is the production of goods and services within a country or the expenditures of goods and services that can be used in the country, not out of the country. It means that the producer belongs to the home country or he produces and invests in the home country.

In official government documents, gross private domestic investment is an investment and the measurement of the production of the business sector in a country. Primarily, private investment is
induced investment, as mentioned earlier, because induced investment comes from inducing income. This research uses private domestic investment to interpret the role of private investment in Pakistan.

**FIGURE: 1= Private Domestic Investment N=46 Years**

![Graph showing private domestic investment over 46 years](image)

**Source**: Economic Survey of Pakistan 2022.

Pakistan has three major sectors: agriculture, service, and manufacturing. Below are data and descriptions of these sectors.

### 6.1 Agricultural Sector

The largest and most significant sector in Pakistan is the agricultural sector, which contributes 22.67 to Pakistan's GDP (SBP 2022). Pakistan is rich in natural resources; Amjad Muhammad (2017) indicates that Pakistan is eighth in the world's ranking. Pakistan's crops rank according to the survey of Amjad as chickpeas (3rd), apricots sixth, cotton, rice and mango, milk, sugarcane and date palm fifth, chinos and cities sixth, wheat and onion 7th, research indicates that the growth rate of the agricultural sector is not increasing significantly since independence.

### 6.2 Manufacturing Sector

The second largest sector of Pakistan is the manufacturing sector; the manufacturing sector of Pakistan contributed 18.8 per cent to Pakistan's GDP in 2022. Pakistan is rich in natural resources, but the economy's slow growth is due to the need for proper utilisation of resources. Moreover, another big problem in Pakistan's economy is the low rate of nonperishable crops such as tomatoes and potatoes. Small industries and private firms make value-added products of these nonperishable crops to stabilise prices and help decrease poverty, inflation, and other economic or noneconomic issues.

### 6.3 Service Sector

Service sector growth is more than Pakistan's agricultural and manufacturing sectors. The service sector contributes more to economic growth than the other two sectors. The service sector in Pakistan
is growing more than the other sectors of the country, as it contributes 58.53 per cent to the GDP (SBP, 2022), which is higher than both other sectors of the economy.

7. Empirical Findings
Table 1 indicates that the variable Private Investment, GDP Growth rate in agriculture, and the GDP growth rate in the manufacturing sector are stationary at Level 1(0). In contrast, the GDP growth rate in the service sector is stationary at first difference 1(1).

**Table 1**: Augmented Dickey-fuller unit root test of selected variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>At level</th>
<th>At first difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>Constant and trends</td>
</tr>
<tr>
<td>Private investment</td>
<td>-3.7442 (0.0064)</td>
<td>4.35166 (0.0142)</td>
</tr>
<tr>
<td>Agricultural GDP growth</td>
<td>3.493 (0.0201)</td>
<td>-3.79303 (0.012)</td>
</tr>
<tr>
<td>growth rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing GDP growth</td>
<td>2.2134(0.21)</td>
<td>2.213(0.23)</td>
</tr>
<tr>
<td>growth rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service sector GDP growth</td>
<td>5.608 (0.001)</td>
<td>-5.8732 (0.000)</td>
</tr>
<tr>
<td>growth rate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values in parentheses ( ) indicates probabilities and * indicates probability is <5%.

The Akakike Information Criterion determines lag lengths with a maximum of 2 lags.

Table 2 shows the results of the VAR analysis. The value of R-squared (i.e. 0.977) implies that the selected independent variables explain about 98 per cent of the variations in private investment. Furthermore, the Value of Adjusted R2 also indicates that the model fits well. At the same time, the significant value of F-Statistics indicates that the equation as a whole is statistically significant. Furthermore, the table shows the VAR estimation data, which indicates that private investment has a positive and significant impact on the service sector and a negative and significant impact on manufacturing.

- The data show the insignificant and negative impact of private investment on the agricultural sector's GDP, so hypothesis 1 is rejected.
- The data shows the significant and negative impact of private investment on the GDP of the manufacturing sector, so hypothesis 1 is accepted.
- The data show private investment's significant and positive impact on the service sector's GDP, so hypothesis 1 is accepted.

**Table: 2 Vector Auto-regression Estimates (Independent variable is a private investment)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>T statistics</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>The GDP growth rate in agriculture</td>
<td>-2.123</td>
<td>0.17</td>
</tr>
<tr>
<td>The GDP growth rate in manufacturing</td>
<td>-2.68</td>
<td>0.085</td>
</tr>
<tr>
<td>The GDP growth rate in service</td>
<td>0.73963</td>
<td>0.056</td>
</tr>
</tbody>
</table>

Statistical Measures Results
R-Square: 0.977
Adjusted R²: 0.9404
F-Statistics: 30.832 (0.000)

The AR polynomial has models of less than one and lies inside the unit circle, which confirms that the VAR-estimated model is stable.

8. Conclusion and Suggestion
Private investment has a significant impact on Pakistan's economic growth. Many research studies by different scholars suggested that private investment can increase employment opportunities, which helps decrease poverty. The largest sector of Pakistan is the agricultural sector, and an opportunity to invest in the agricultural sector is available due to abundant resources. However, agricultural sector growth is not significantly increasing for many reasons, such as unstable crop prices, lack of new research and techniques, and lack of suitable warehouses. The agricultural and manufacturing sectors also need to increase private investment, which increases the ratio of small and medium enterprises, which is the primary source of decreasing unemployment in the country. The private investment ratio in the service sector is more than that of other sectors, and the growth of the service sector is also more compared to the other two sectors; empirical findings of the VAR model show that the value of R-squared (i.e. 0.977) implies that the selected independent variables explain about 98 per cent of the variations in private investment.

Furthermore, the Value of Adjusted R² also indicates that the model fits well. At the same time, the significant value of F-Statistics indicates that the equation as a whole is statistically significant. Furthermore, The VAR estimation data indicates that private investment has a positive and significant impact on the service sector and a negative and significant impact on manufacturing.
The data shows an insignificant and negative impact of private investment on the GDP of the agricultural sector, so hypothesis 1 is rejected. Conversely, the data shows a significant and negative impact of private investment on the GDP of the manufacturing sector, so hypothesis 1 is accepted.

Additionally, the data shows a significant and positive impact of private investment on the GDP of the service sector. Private investment has a positive and significant impact on Pakistan's service sector. At the same time, the insignificant and positive impact of private investment on the agricultural sector indicates that the ratio of private investment is much less than public investment in the agricultural sector. Based on the study results, it is recommended that Pakistan increase sustainable growth in the private sector, leading to increased economic growth. It is also suggested that the government should give proper attention to the development of infrastructure and the transformation of locals to enhance the output of production, which also leads to an increase in exports and motivates investors to invest in the private sector.

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