

The Impact of Investment Funds on Economic Growth in Saudi Arabia: A Multivariate Analysis



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This study assesses the impact of mutual investment funds on Saudi Arabia's economic growth from 1998 to 2022, focusing on GDP, unemployment, inflation, and the Tadawul stock exchange. Multivariate Analysis of Variance shows a positive correlation between investment fund variables and key economic indicators, even during financial crises. The findings underscore the significance of monitoring these variables for informed policymaking and investment strategies. Despite study limitations, it emphasizes the need for future research to explore additional determinants and external influences on investment funds, enriching the existing body of knowledge on the subject and guiding comprehensive economic planning.

Keywords: Saudi Arabia, Investment Funds, Economic Growth, Mutual Investments, Tadawul Stock Exchange, Multivariate Analysis.

1. Introduction

In developing countries like Saudi Arabia, domestic investment has been a major driver of economic growth. Recent decades have seen a meteoric rise in foreign direct investment (FDI) as a direct result of rising investment needs and the subsequent need to fuel economic expansion (Mwakabungu & Kauangal, 2023). The FDI is seen as a form of technology transfer since multinational corporations (MNCs) share their expertise with emerging nations. Following the adoption of trade openness policies in the 1980s, a steady inflow of FDI into developing countries began in the early 1990s. Capital inflows, cutting-edge technology, savvy management, and the creation of new jobs are just some of the ways in which FDI can contribute to economic progress in developing countries (Belloumi & Alshehry, 2018; Elmonshid et al., 2022; Owusu, 2021).

Different scholars across the world have debated the effectiveness of active mutual funds (Abdulkarim, 2023; Bouchoucha & Bakari, 2021; Elneel, 2023; Khathlan, 2014; Owusu, 2021). Public, private, and FDI investment have all been linked to higher rates of economic growth in some research, while other studies have found either no correlation or an opposite one. This research intends to investigate the dynamic causal links between investment funds and economic growth in Saudi Arabia using multivariate analysis and offer strategic approaches to progress the economy further.

The assumption that FDI rather than domestic investment drives development has been the topic of previous empirical studies. While foreign investment is often cited as the driving force behind economic expansion and the most effective strategy for generating new jobs, domestic investment may be just as important. The private sector in Saudi Arabia has been accelerated by foreign investors in order to fulfill the needs of the country (Grand & Wolff, 2020; Marashdeh & Al-Malkawi, 2014). As a result, this study uses a multivariate analysis approach to inquire into the dynamic causal linkages between investment funds and economic growth in Saudi Arabia from 1998-2022. The impact of investment funds on Saudi Arabia's GDP growth and non-oil GDP is analyzed, with trade openness added as a control variable (Abdulkarim, 2023). This study's importance rests in the fact that policy decisions would be profoundly affected by the dynamic interactions among various macroeconomic forces.

Oil reserves are substantial, and Saudi Arabia also boasts the world's fourth-largest natural gas reserve. Nonetheless, in terms of economic growth, it is not among the top countries in the world. Economic indicators have been severely hampered by the financial crises and the COVID-19 pandemic, with the real GDP falling by 4.3% and 4.1%, respectively, and the Tadawul All Share Index falling by 7.1% in December 2022. When there is a funding gap between what is needed for investment and what can be raised locally through savings, foreign investment from major multinational firms can help bridge the gap. Because operational companies must pay taxes and resources must be mobilized regardless of where they are based, FDI helps to complement government tax collections and locally raised taxes (Khang & Nguyễn, 2021; Owusu, 2021).

Capital, technological know-how, managerial expertise, and exposure to new markets are just some of the benefits that Saudi Arabia's economy reap from FDI. Foreign investment in Saudi Arabia is one of the many investment matters that have been actively managed by the Saudi Arabian General Investment Authority (SAGIA). This entails, among other things, the formulation of state policies that encourage domestic and international investment, the development of programs to enhance the investment climate, the monitoring and evaluation of investment activities, and the direction of research into the viability of investment opportunities (Mahran, 2012).

The Public Investment Fund (PIF) is a significant element in the Vision 2030 strategy for converting Saudi Arabia from one source of income (oil) to diversified sources of income. However, the PIF's central function in realizing economic

diversification is still up for debate. PIF-invested businesses may be impacted by Saudi Arabia's Vision 2030 plan to amass the world's largest sovereign wealth fund (Grand & Wolff, 2020). Finally, the study evaluates the influence of insurance investment on economic growth in Saudi Arabia and calculates the contribution of mutual investment funds to economic growth in Saudi Arabia (Abdulkarim, 2023; Khathlan, 2014).

The purpose of this research was to analyze how mutual investments from Saudi Arabia affected economic growth and its performance on the Tadawul stock exchange. Consequently, the study adds to the growing body of research on the relationship between mutual investment and economic growth in Saudi Arabia by analyzing the country from a variety of angles. The financial crisis effects on the performance of equities mutual funds are also analyzed, along with fund managers' abilities to cope with the pandemic's aftermath.

The role of mutual investment funds in driving expansion in the Saudi Arabian economy is also evaluated. This analysis uses data on mutual investment and GDP from 1998 through 2022 to examine the impact of mutual investment on economic growth in Saudi Arabia. Policymakers, academics, and other researchers can all benefit from the study's findings, as they could form the basis for economic policy decisions, add to the body of literature on the relationship between mutual investment funds and economic growth, and provide a future research resource.

2. Literature Review

The Impact of Mutual Investment on Economic Growth

Mutual investment inflows significantly benefit capital-intensive initiatives in recipient nations by accelerating capital accumulation and closing the resource gap. In a neoclassical framework, the relationship between mutual investment and GDP growth can be elucidated through the lens of trade liberalization, reduced restrictions on foreign investment, and relaxed government regulation. Capital and labor stock increases are traditionally regarded as the primary drivers of economic expansion (Khathlan, 2014; Marashdeh & Al-Malkawi, 2014). However, competing hypotheses exist regarding the impact of mutual investment on the economic development of the receiving nation. The establishment of robust financial market systems in host nations and the resolution of bureaucratic obstacles is imperative for the successful implementation of the mutual investment-driven growth theory, which is substantiated by empirical data. While this contradicts the notion of mutual investment-led growth, there is some evidence that economic growth influences mutual investment inflows in a receiving nation (Javid et al., 2022; Khathlan, 2014).

The political and socioeconomic conditions of Saudi Arabia influence its economic development. Mutual investment is viewed as a means of augmenting domestic capital and obtaining critical technologies that would otherwise be unavailable. Economic expansion can be stimulated through mutual investment, which can also facilitate the training of labor, the transfer of technologies, and the improvement of domestic sectors. Economic growth is not significantly impacted by mutual investment, and the Saudi Arabia General Investment Authority (SAGIA) has played a crucial role in facilitating economic liberalization. Research indicates, nevertheless, that mutual investment has the potential to stimulate development through technological advancements, capital accumulation, increased exports, and enhanced human capital. Regarding the nature of this negligible impact, mutual investment on GDP growth remains to be debatable (Marashdeh & Al-Malkawi, 2014).

The productivity of mutual investment influences GDP expansion; this relationship is sensitive to the initial conditions in the host country as well as the degree of complementarity between mutual investment and domestic investment. It has been demonstrated that mutual investment and economic growth are causally related over the long term (Khathlan, 2014). While not a direct contributor to GDP growth, mutual investment may indirectly foster development through the facilitation of specialized labor formation. Mutual investment positively impacts economic growth in Sub-Saharan Africa through a net crowding out effect. In order to guarantee long-term economic expansion, policymakers should consider augmenting foreign direct investment inflows. Generally, economic freedom, trade openness, labor force, and economic freedom are determinants that stimulate growth, which in turn stimulates mutual investment (Alqadhib et al., 2022).

Inconsistent results have been reported by numerous studies that have investigated the relationship between domestic investment and economic growth (Abdulkarim, 2023; Elmonshid et al., 2022; Khang & Nguyễn, 2021; Mahran, 2012; Morina et al., 2022; Nguyen et al., 2022). In the context of nations such as Saudi Arabia, divergent research opinions exist regarding the impact of mutual investment on economic growth. Research has shown that contingent on the economic and political climate of a given nation, mutual investment can either discourage or stimulate domestic investment. In developing countries, the topics of domestic investment and economic growth remain subjects of ongoing debate, notwithstanding the existence of conflicting research outcomes (Jawadi & Ftiti, 2019).

More research needs to be conducted on the comparative effectiveness of mutual investment and domestic investment in terms of GDP growth. Even in countries such as Saudi Arabia, which receive relatively little mutual investment, mutual investment has been observed to have a positive impact on domestic investment and economic expansion. There exists a bidirectional relationship between mutual investment and economic development, with domestic investment bearing a more direct responsibility for the former. Both mutual investment and domestic investment have a negative long-term effect on economic development in Saudi Arabia. However, the effect on short-term growth remains neutral. The proportion of mutual investment inflows to the country has increased relative to Saudi Arabia being the leading contributor. Consistently increasing from 6.6% in 1980 to 8.3% in 1990 and then decreasing to 3.7% in 2010, the GDP growth rate of Saudi Arabia has risen steadily since 1980. However, little evidence suggests that FDI contributes directly to GDP growth. Consequently, mutual investment is essential for a nation's development and for averting economic crises (Alsuhailani et al., 2023; Belloumi & Alshehry, 2018; Marashdeh & Al-Malkawi, 2014).

The Performance of Mutual Funds during the COVID-19 Pandemic in Saudi Arabia

As an essential component of the Saudi Arabian economy, mutual fund performance influences the investment climate in that country. Despite being utilized to analyze the performance of these funds, the capital asset pricing model (CAPM) has encountered criticism due to its limited capacity to account for all risk factors that impact the anticipated returns of an asset (Mahran, 2012; Ouassaf et al., 2023). Recent studies, nevertheless, have provided evidence that the factor model, which incorporates investment and profitability risk, surpasses alternative approaches when it comes to forecasting portfolio returns in both mature and developing economies (Elmonshid et al., 2022; Khathlan, 2014; Mahran, 2012; Ouassaf et al., 2023). By employing the five-factor model recently developed by Alqadhib et al. (2022), this study analyzes the performance of Saudi mutual funds in various market conditions, including the COVID-19 pandemic. This research elucidates the performance of Saudi mutual funds during periods of high investor activity.

The role of mutual investment in Saudi Arabia's economic growth has grown substantially. However, the literature regarding the impacts of mutual investment on the recipient nation is scarce. It has been demonstrated that multinational corporations, in comparison to their local equivalents, maintain greater administrative personnel and exhibit higher levels of labor productivity (Jawadi & Ftiti, 2019; Khathlan, 2014; Ouassaf et al., 2023). Governments are progressively offering enticing incentives to foreign enterprises due to their recognition that their presence enhances the overall productivity of the industry. Oil price volatility, fund flows, size, management fees, and fund age are a few of the variables that impact the performance of Saudi Arabian mutual funds. The extensive ramifications of the COVID-19 pandemic encompass modified patterns of stock price movement and potentially diminished avenues for mutual fund managers to pursue diversification. In order to effectively manage and attract mutual investment in Saudi Arabia, a comprehensive understanding of the impacts that mutual investment has on the nation's financial system is essential (Alqadhib et al., 2022).

The COVID-19 epidemic has had a significant adverse effect on the returns of mutual funds in Saudi Arabia, as the stock market has exhibited a more pronounced reaction to the escalating number of confirmed cases of the disease. The stock market's regular operations have been disrupted as a result of governmental measures implemented to contain the pandemic, including port restrictions and mandatory evacuation. Equity investment fund managers have implemented strategies to alleviate the adverse impact of the COVID-19 pandemic on the funds' performance (Alqadhib et al., 2022). Both incoming mutual investment and outgoing commerce, according to the research, contribute to the mutual investment-economic growth paradigm.

3. Theoretical Framework

There are a number of theories that attempt to explain the motivations and patterns of mutual investment and their effects on economic growth. However, the theoretical framework offered in this study focuses on the relationship between mutual investment and economic growth. The study is built on the macroeconomic viewpoint, the accelerator theory of investment, the crowding-in and crowding-out effects of public policy, the growth model of investment, and the investment multiplier model. The input also highlights the elements that determine the rate of economic growth, including capital and labor inputs, new ideas and technologies, and national wealth. The relevance of mutual investment, credit to the private sector, trade openness, gross national expenditure, and economic growth is also highlighted, as is the need to evaluate current time series data (Alsuhaibani et al., 2023; Mahran, 2012; Ouassaf et al., 2023).

To keep up with rising demand and profits, firms are expected to increase their investment in accordance with the accelerator idea. However, according to the flexible accelerator model, a company's investment is based on the gap between its present and target capitalization levels. Public spending on infrastructure and public goods supplements private investments, as theorized by the crowding-in and crowding-out acceleration theories. The allocation of capital and the management of economic resources are made possible by the insights provided by these ideas on the connection between investment and economic growth (Marashdeh & Al-Malkawi, 2014; Mwakabungu & Kauangal, 2023; Tang & Chng, 2012).

Government expenditure, inflation, and political instability all play a role in deterring investors from funding economic expansion. Solow and Swan proposed a growth model that attributes expansion to higher inputs of capital and labor, as well as to the introduction of novel ideas and technologies (Belloumi & Alshehry, 2018; Bouchoucha & Bakari, 2021; Khang & Nguyễn, 2021; Ribaj & Mexhuani, 2021). The Harrod-Domar growth model explains the relationship between economic growth and unemployment in industrialized countries. The Solow model, on the other hand, incorporates both human labor and technological advancement into the expansion process, stressing the significance of technological advancement to both rapid expansion and sustained development. The Keynesian-inspired Solow model of economic growth accounts for the long-term effects of population, technical advances, and savings on output and growth (Khathlan, 2014; Mwakabungu & Kauangal, 2023). This research uses the most recent time series data from 1998 to 2022 to examine a thorough multivariate causal link between mutual investment, numbers of subscribers, domestic assets, foreign assets, total assets of funds, unemployment rate, GDP, inflation rate, and Tadawul all share index. Investors can better contribute to a country's economic success if they have a firm grasp of these elements.

4. Methodology

Research Design

This study examines the impact that mutual funds have had on the economic growth of Saudi Arabia. A number of secondary sources, including news articles about financial crises and data from Saudi Arabia's COVID-19 survey, were utilized to

compile the information. The information was obtained from publicly available sources, such as investing databases, data source. kapsarc, and Macro Trends. The data for the GDP, Inflation Rate, and Unemployment Rate were obtained from Macro Trends (macro trends.net), whereas Investing.com provided the TASI statistics. Annual time series data from 1998 to 2022 are utilized in this study to represent the following: economic growth, gross fixed capital formation, inward mutual investment flows, subscriber numbers, domestic assets, foreign assets, total fund assets, unemployment rate, GDP, inflation rate, and the Tadawul all share index.

Research Model

Let us denote the dependent variables GDP as Y1, Unemployment Rate as Y2, Inflation Rate as Y3, and Tadawul All Share Index as Y4, and the independent variables No. of Operating Funds as X1, No. of Subscribers as X2, Domestic Assets (Millions of Riyals) as X3, Foreign Assets (Millions of Riyals) as X4, Total Assets of Funds (Millions of Riyals) as X5, Financial Crisis Period as X6, and COVID-19 Period as X7. The MANOVA model coefficients provided can be used to formulate the equations for each dependent variable (Y) as follows:

For GDP (Y1)

$$Y1 = 533.2126 + 215.0304 * X1 - 25.0783 * X2 + 298092.6696 * X3 + 114970.2663 * X4 - 385548.3926 * X5 - 72.5144 * X6 + 122.9392 * X7 + \epsilon_1$$

For Unemployment Rate (Y2)

$$Y2 = 5.6036 + 0.1360 * X1 - 0.0380 * X2 + 15634.9300 * X3 + 6035.6330 * X4 - 20225.0900 * X5 - 0.1256 * X6 + 0.0510 * X7 + \epsilon_2$$

For Inflation Rate (Y3)

$$Y3 = 2.0317 + 1.9983 * X1 + 0.7673 * X2 + 3113.9494 * X3 + 1203.3433 * X4 - 4030.7395 * X5 + 1.0759 * X6 + 0.3320 * X7 + \epsilon_3$$

For Tadawul All Share Index (Y4)

$$Y4 = 6984.9652 - 275.3334 * X1 + 2259.5725 * X2 + 7727446.4100 * X3 + 2982530.0879 * X4 - 9993828.2176 * X5 - 454.0648 * X6 - 1314.6563 * X7 + \epsilon_4$$

In these equations, ϵ_1 , ϵ_2 , ϵ_3 , and ϵ_4 represent the error terms. These equations illustrate how each dependent variable (GDP, Unemployment Rate, Inflation Rate, and Tadawul All Share Index) is influenced by the respective independent variables (Number of Operating Funds, Number of Subscribers, Domestic Assets, Foreign Assets, Total Assets of Funds, Financial Crisis Period, and COVID-19 Period) based on the MANOVA coefficients you provided. These equations can be used for further analysis and interpretation of the relationships between the variables.

Multivariate Analysis

In this study, a Multivariate Analysis of Variance (MANOVA) was conducted to investigate the combined impact of investment fund variables on multiple economic growth indicators in Saudi Arabia. MANOVA is a powerful statistical technique that allows us to simultaneously consider the effects of investment fund variables on a group of economic variables, providing a holistic understanding of their relationships. In order to facilitate the analysis of the data, one-way MANOVA, the mean, and standard deviation were utilized (Tang & Chng, 2012). The objective of this study was to analyze the influence of mutual funds on the economic progress of Saudi Arabia spanning the years 1998 to 2022. It examined the impact of the dependent variable (GDP, Unemployment Rate, Inflation Rate, and Tadawul All Share Index) is influenced by the respective independent variables (Number of Operating Funds, Number of Subscribers, Domestic Assets, Foreign Assets, Total Assets of Funds, Financial Crisis Period, and COVID-19 Period) based on the MANOVA coefficients provided. A multivariate analysis spanning the years 1998 to 2022 was conducted (Elneel, 2023; Shiker, 2012). Macro trends.net, Investing.com, and datasource.kapsarc.org provided the information. R-studio software was utilized for computation. Number of Operating Funds, Number of Subscribers, Domestic Assets, Foreign Assets, Total Assets of Funds, Financial Crisis Period, and COVID-19 Period are the independent variables examined in this research using a multivariate model (Owusu, 2019). The MANOVA analysis was conducted to assess the collective impact of investment fund variables on multiple economic growth indicators, including Unemployment Rate, GDP, Inflation Rate, and TASI. Table 3 below summarizes the results.

Hypothesis

- There is a positive relationship between the number of operating funds (No. of Operating Funds) and key economic indicators, such as GDP (Billions of USD) and the Tadawul All Share Index.
- The domestic assets (Domestic Assets in Millions of Riyals) and foreign assets (Foreign Assets in Millions of Riyals) of investment funds have a significant impact on the Saudi Arabian economy.
- The occurrence of external factors, such as financial crises (Financial Crisis Period) and the COVID-19 pandemic (COVID-19 period), has a significant influence on economic growth and indicators.

Empirical Result

Table 1 below presents a statistical summary of key variables, providing an overview of their minimum, 1st Quantile, median, mean, 3rd Quantile, and maximum values. These statistics offer insights into the distribution and central tendencies of each variable.

Table 1 Statistical Summary of Key Variables

Variables	Minimum	1st Quantile	Median	Mean	3rd Quantile	Maximum
No. of Operating Funds	121	188	244	220.3	254	275
No. of Subscribers	69543	198357	275624	299088	358894	652869
Domestic Assets (Millions of Riyals)	12001	44490	74135	72702	91145	149562
Foreign Assets (Millions of Riyals)	13008	17181	19643	23959	24919	79484
Total Assets of Funds (Millions of Riyals)	25009	60317	89548	96662	110711	227173
Unemployment Rate (%)	4.35	5.38	5.6	5.604	5.82	7.45
GDP (Billions of USD)	146.8	258.7	528.2	533.2	741.9	1108.1
Inflation Rate (%)	-2.0933	0.2472	2.209	2.0317	3.4455	9.8702
Tadawul All Share Index	1413	4803	7210	6985	8389	16713

The number of operating funds ranges from a minimum of 121 to a maximum of 275, with a mean value of approximately 220.3. The majority of data points fall between 188 and 254. The number of subscribers shows a wide range, with a minimum of 69,543 and a maximum of 652,869. The mean value is approximately 299,088, and the middle 50% of data points fall between 198,357 and 358,894.

Domestic assets vary from 12,001 to 149,562 million riyals, with a mean of 72,702 million riyals. The interquartile range spans from 44,490 to 91,145 million riyals. Foreign assets range from 13,008 to 79,484 million riyals, with a mean of approximately 23,959 million riyals. The first and third quartiles cover the range of 17,181 to 24,919 million riyals. The total assets of funds range from 25,009 to 227,173 million riyals, with a mean value of 96,662 million riyals. The middle 50% of data points fall between 60,317 and 110,711 million riyals.

The unemployment rate spans from 4.35% to 7.45%, with a mean value of approximately 5.604%. The majority of data points are between 5.38% and 5.82%. GDP ranges from 146.8 billion USD to 1,108.1 billion USD, with a mean of approximately 533.2 billion USD. The middle 50% of data points are within the range of 258.7 billion USD to 741.9 billion USD. Inflation rates vary from -2.0933% to 9.8702%, with a mean value of approximately 2.0317%. The interquartile range extends from 0.2472% to 3.4455%. The Tadawul All Share Index ranges from 1,413 to 16,713, with a mean value of approximately 6,985. The first and third quartiles span from 4,803 to 8,389.

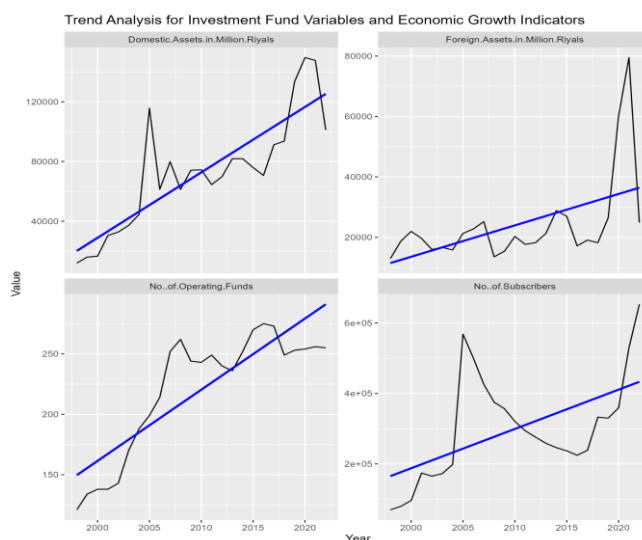


Figure 1 Trend Analysis for Investment Fund Variables and Economic Growth (Domestic Assets, Foreign Assets, Operating Funds, and Subscribers) in Saudi Arabia from 1998 to 2022

Figure 1 above shows the trend analysis for investment fund variables and economic growth in Saudi Arabia from 1998 to 2022. The plot consists of four subplots, each displaying a different variable related to investment funds: domestic assets, foreign assets, operating funds, and subscribers. The plot uses a blue line to represent the trend and a black line to represent the actual observations of the variables. The plot aims to explore the relationship between the variables over time. From the domestic assets historical trend plot, it is observed that the number of domestic assets started at 12,001 million Riyals in 1998 and gradually increased over the years. Notably, there was a significant surge in domestic assets around 2005, reaching a peak of 115,661 million Riyals. However, from 2006 to 2008, there was a decline in domestic assets. Subsequently, the number of

domestic assets rebounded and continued to increase from 2009 to 2021, reaching a high of 147,689 million Riyals in 2021. In 2022, there was a decrease, with domestic assets at 101,186 million Riyals.

From the foreign assets historical trend plot, it is observed that the blue trend line indicates a gradual increase in foreign assets over the years. In 1998, the foreign assets started at 13,008 million Riyals and gradually increased over the years. Notably, there was a significant surge in foreign assets around 2007, reaching a peak of 25211 million Riyals. However, in 2008, there was a decline in foreign assets. Subsequently, the foreign assets rebounded and continued to increase from 2016 to 2021, reaching a high of 79,484 million Riyals in 2021. In 2022, there was a further decrease, with foreign assets at 24,919 million Riyals. From the number of operating funds historical trend plot, it is observed that the blue trend line indicates a gradual increase in the number of operating funds over the years. Notably, the number of operating funds started at 121 in 1998 and steadily increased. There was a peak of 275 operating funds in 2016, followed by a slight decline. In 2022, there were 255 operating funds.

From the number of subscriber's historical trend plots, it is observed that the blue trend line indicates a gradual increase over the years. In 1998, the number of subscribers started at 69,543 and gradually increased over the years. Notably, there was a significant surge in subscribers around 2005, reaching a peak of 568,284. However, from 2006 to 2016, there was a decline in subscribers. Subsequently, the number of subscribers rebounded and continued to increase from 2017 to 2021, reaching a high of 529,312 in 2021. In 2022, there was a further increase, with 652,869 subscribers. Overall, this visual representation provides insights into the growth and fluctuations in values of these variables over 25 years.

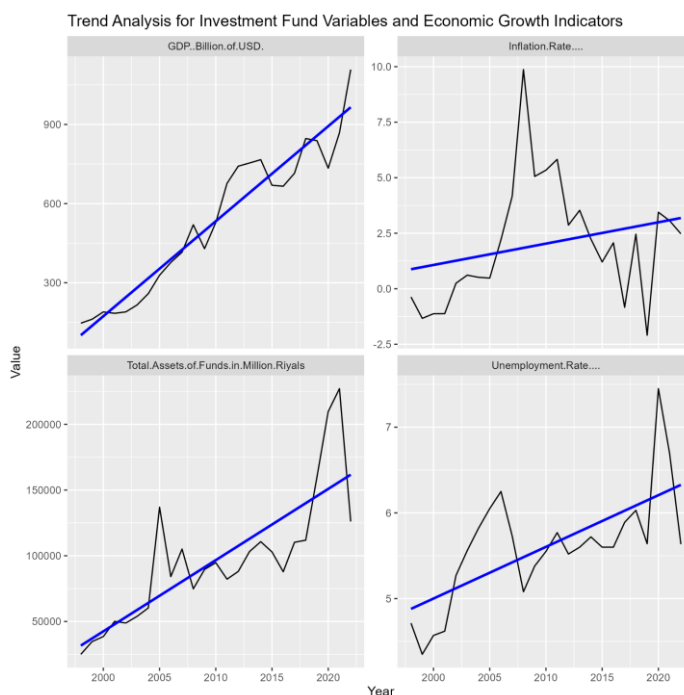


Figure 2 Trend Analysis for Investment Fund Variables and Economic Growth (GDP, Inflation Rate, Total Assets of Funds, and Unemployment Rate) in Saudi Arabia from 1998 to 2022

Figure 2 above shows the trend analysis for investment fund variables and economic growth in Saudi Arabia from 1998 to 2022. The plot consists of four subplots, each displaying a different variable related to investment funds and economic growth: GDP, Inflation Rate, Total Assets of Funds, and Unemployment Rate. The plot uses a blue line to represent the trend and a black line to represent the actual observations of the variables. The plot aims to explore the relationship between the variables over time. From the GDP historical trend plot, it is observed that the blue trend line indicates a gradual increase in GDP over the years. In 1998, the GDP started at 146.78 billion USD and gradually increased over the years. Notably, there was a significant surge in GDP around 2008, reaching a peak of 519.80 billion USD. However, from 2008 to 2009, there was a slight decline in GDP. Subsequently, the GDP rebounded and continued to increase from 2009 to 2021, reaching a high of 868.59 billion USD in 2021. In 2022, there was a further increase, with GDP at 1108.15 billion USD.

From the plot, it is shown that the inflation rate started at -0.3713% in 1998, indicating deflation (a decrease in general price levels). From 1999 to 2001, there was continued deflation, with negative inflation rates. However, from 2002 to 2007, there was a shift to positive inflation rates, indicating an increase in prices. Notably, the inflation rate peaked in 2008 at an alarming 9.8702%, reflecting a surge in prices. From 2009 to 2011, the inflation rate remained moderate, ranging from 5.0572% to 5.8262%. In 2019, there was deflation again at -2.0933%. In recent years, from 2020 to 2022, the inflation rate has been positive but relatively stable, ranging from 2.4741% to 3.4455%. From the total assets of funds historical trend plot, it is observed that the blue trend line indicates a gradual increase in total assets of funds over the years. In 1998, the total assets of funds started at 25,009 million Riyals and gradually increased over the years. Notably, there was a significant surge

in total assets around 2005, reaching a peak of 136,974 million Riyals. However, from 2006 to 2008, there was a decline in total assets. Subsequently, the total assets rebounded and continued to increase from 2009 to 2021, reaching a high of 227,173 million Riyals in 2021. In 2022, there was a decrease, with total assets at 126,105 million Riyals.

From the plot, it is shown that the unemployment rate started at 4.713% in 1998 and gradually fluctuated over the years. Notably, there was a significant surge in the unemployment rate around 2006, reaching a peak of 6.25%. However, from 2007 to 2008, there was a decline in the unemployment rate. Subsequently, the unemployment rate increased again from 2009 to 2021, reaching a high of 6.692% in 2021. In 2022, there was a slight decrease, with the unemployment rate at 5.635%. Overall, this visual representation provides insights into the growth and fluctuations in values of these variables over 25 years.

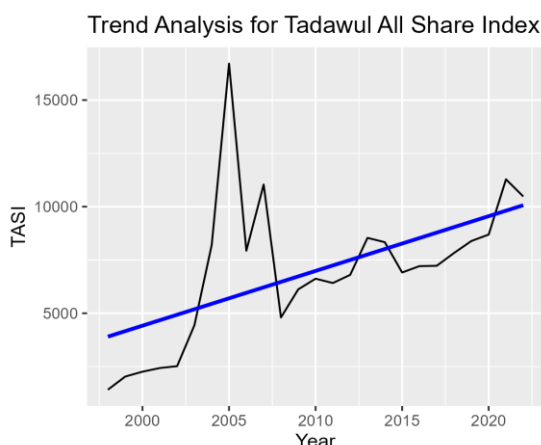


Figure 3 Trend Analysis for the Tadawul All Share Index from 1998 to 2022

Figure 3 represents the historical trend of the TASI values from 1998 to 2022. In 1998, the TASI values started at 1413.1 in 1998 and gradually increased over the years. Notably, there was a significant surge in TASI values around 2005, reaching a peak of 16712.64. However, from 2006 to 2008, there was a decline in TASI values. Subsequently, the TASI rebounded and continued to increase from 2009 to 2021, reaching a high of 11281.71 in 2021. In 2022, there was a slight decrease, with TASI values at 10478.46. Overall, this visual representation provides insights into the performance of the Saudi stock market index over the past two decades.

Table 2, which shows the correlation matrix below, provides insights into the relationships between investment fund variables, economic indicators, and external factors, such as the Financial Crisis Period and the COVID-19 period. The values represent Pearson correlation coefficients, ranging from -1 (perfect negative correlation) to 1 (perfect positive correlation). The closer a coefficient is to 1 or -1, the stronger the correlation, while values closer to 0 indicate weaker or no correlation.

Table 2 Correlation Matrix

	NOF	NoS	DA	FA	TAF	UR	GDP	IR	TASI	FCP	CP
NOF	1	0.56	0.73	0.29	0.66	0.61	0.83	0.55	0.59	0.24	0.26
NoS	0.56	1	0.71	0.40	0.67	0.60	0.55	0.42	0.81	0.22	0.54
DA	0.73	0.71	1	0.68	0.98	0.82	0.76	0.22	0.78	-0.01	0.60
FA	0.29	0.40	0.68	1	0.82	0.66	0.41	0.07	0.39	-0.15	0.79
TAF	0.66	0.67	0.98	0.82	1	0.83	0.71	0.19	0.72	-0.05	0.70
UR	0.61	0.60	0.82	0.66	0.83	1	0.55	0.26	0.69	-0.12	0.57
GDP	0.83	0.55	0.76	0.41	0.71	0.55	1	0.31	0.52	-0.11	0.51
IR	0.55	0.42	0.22	0.07	0.19	0.26	0.31	1	0.20	0.60	0.13
TASI	0.59	0.81	0.78	0.39	0.72	0.69	0.52	0.20	1	0.04	0.35
FCP	0.24	0.22	-0.01	-0.15	-0.05	-0.12	-0.11	0.60	0.04	1	-0.14
CP	0.26	0.54	0.60	0.79	0.70	0.57	0.51	0.13	0.35	-0.14	1

Where NOF - No. of Operating Funds, NoS - No. of Subscribers, DA - Domestic Assets (Millions of Riyals), FA - Foreign Assets (Millions of Riyals), TAF - Total Assets of Funds (Millions of Riyals), UR - Unemployment Rate (%), GDP - GDP (Billions of USD), IR - Inflation Rate (%), TASI - Tadawul All Share Index, FCP - Financial Crisis Period and CP - COVID-19 period

Notable positive correlations are observed between several variables. For example, there is a strong positive correlation (0.83) between GDP and the number of operating funds, indicating that as the number of operating funds increases, GDP tends to increase as well. Similar strong positive correlations are seen between GDP and other investment fund variables. On the other hand, there is a strong negative correlation (-0.15) between the Financial Crisis Period and Foreign Assets. This suggests that during financial crises, foreign assets decrease. Moderate correlations are seen between various economic variables. For instance, there is a moderate positive correlation (0.60) between the Inflation Rate and the COVID-19 period. Some variables have no or weak correlations. For example, there is a weak correlation (0.04) between the Tadawul All Share Index and the Financial Crisis Period.

Table 3 MANOVA Model Summary

Variable	Pillai Statistic	Approx. F-Value	Num Df	Den Df	Pr(>F)
No. of Operating Funds	0.95323	71.327	4	14	3.758e-09 ***
No. of Subscribers	0.75476	10.772	4	14	0.0003352 ***
Domestic Assets in Million Riyals	0.8158	15.501	4	14	4.829e-05 ***
Foreign Assets in Million Riyals	0.26141	1.239	4	14	0.3393022
Total Assets of Funds in Million Riyals	0.16985	0.716	4	14	0.5947411
Financial Crisis Period	0.68781	7.711	4	14	0.0016807 **
COVID-19 Period	0.45035	2.868	4	14	0.0629344.
Residuals	-	-	17	-	-

The multivariate test statistics reveal a significant impact of the number of operating funds on the group of economic indicators (Pillai = 0.95323, $F(4, 14) = 71.327$, $p < 0.001$). This suggests that changes in the number of operating funds collectively affect the Unemployment Rate, GDP, Inflation Rate, and TASI. The number of subscribers also has a statistically significant impact on the economic indicators (Pillai = 0.75476, $F(4, 14) = 10.772$, $p = 0.0003352$). It implies that variations in the number of subscribers influence the Unemployment Rate, GDP, Inflation Rate, and TASI simultaneously.

Domestic assets in a million riyals demonstrate a significant effect on the group of economic indicators (Pillai = 0.81580, $F(4, 14) = 15.501$, $p = 4.829e-05$). Changes in domestic assets impact the Unemployment Rate, GDP, Inflation Rate, and TASI. While the multivariate test does not reveal a statistically significant impact of foreign assets (Pillai = 0.26141, $F(4, 14) = 1.239$, $p = 0.3393022$), it is important to note that this variable does not have a collective influence on the economic indicators. Similarly, the total assets of funds do not show a significant effect (Pillai = 0.16985, $F(4, 14) = 0.716$, $p = 0.5947411$) on the group of economic indicators.

The financial crisis period has a substantial collective impact on the economic indicators (Pillai = 0.68781, $F(4, 14) = 7.711$, $p = 0.0016807$). This period significantly influences the Unemployment Rate, GDP, Inflation Rate, and TASI. While the impact of the COVID-19 period is not highly significant (Pillai = 0.45035, $F(4, 14) = 2.868$, $p = 0.0629344$), it still has a noticeable effect on the economic indicators. The results of the MANOVA analysis indicate that investment fund variables, specifically the number of operating funds, the number of subscribers, and domestic assets in million riyals, collectively impact the economic growth indicators. Additionally, external factors, such as the financial crisis and the COVID-19 period, influence the economic indicators as well.

Table 4 below shows the coefficients of the MANOVA model for each of the dependent variables (GDP, Unemployment Rate, Inflation Rate, Tadawul All Share Index). These coefficients represent the relationships between the independent variables and the dependent variables. The independent variables have been standardized for comparison.

Table 4 MANOVA Model Coefficients

	GDP (Billions of USD)	Unemployment Rate (%)	Inflation Rate (%)	Tadawul All Share Index
(Intercept)	533.2126	5.6036	2.0317	6984.9652
No. of Operating Funds	215.0304	0.1360	1.9983	-275.3334
No. of Subscribers	-25.0783	-0.0380	0.7673	2259.5725
Domestic Assets (Million of Riyals)	298092.6696	15634.9300	3113.9494	7727446.4100
Foreign Assets (Million of Riyals)	114970.2663	6035.6330	1203.3433	2982530.0879
Total Assets of Funds (Million of Riyals)	-385548.3926	-20225.0900	-4030.7395	-9993828.2176
Financial Crisis Period	-72.5144	-0.1256	1.0759	-454.0648
COVID-19 Period	122.9392	0.0510	0.3320	-1314.6563

The intercept for GDP is 533.2126. This represents the expected value of GDP when all other independent variables are zero. In this context, it may not have a direct economic interpretation. The intercept for the unemployment rate is 5.6036. This represents the expected unemployment rate when all other independent variables are zero. The intercept for the inflation rate is 2.0317. This represents the expected inflation rate when all other independent variables are zero. The intercept for the Tadawul All Share Index is 6984.9652. This represents the expected index value when all other independent variables are zero.

The coefficient for the number of operating funds (No. of Operating Funds) is 215.0304. This indicates that for each standard deviation increase in the number of operating funds, GDP is expected to increase by 215.0304 billion USD, holding all other variables constant. The coefficient for the unemployment rate is 0.1360. This suggests that for each standard deviation increase in the number of operating funds, the unemployment rate is expected to increase by 0.1360 percentage points. The coefficient for the inflation rate is 1.9983. For each standard deviation increase in the number of operating funds, the inflation rate is expected to increase by 1.9983 percentage points. The coefficient for the Tadawul All Share Index is -275.3334. This implies that for each standard deviation increase in the number of operating funds, the Tadawul All Share Index is expected to decrease by 275.3334 points.

The coefficient for the number of subscribers (No. of Subscribers) is -25.0783. This suggests that for each standard deviation increase in the number of subscribers, GDP is expected to decrease by 25.0783 billion USD, holding all other variables constant. The coefficient for the unemployment rate is -0.0380. For each standard deviation increase in the number

of subscribers, the unemployment rate is expected to decrease by 0.0380 percentage points. The coefficient for the inflation rate is 0.7673. This indicates that for each standard deviation increase in the number of subscribers, the inflation rate is expected to increase by 0.7673 percentage points. The coefficient for the Tadawul All Share Index is 2259.5725. This implies that for each standard deviation increase in the number of subscribers, the Tadawul All Share Index is expected to increase by 2259.5725 points.

The coefficient for domestic assets is 298,092.6696. This suggests that for each standard deviation increase in domestic assets, GDP is expected to increase by 298,092.6696 billion USD, holding all other variables constant. The coefficient for the unemployment rate is 15,634.9300. For each standard deviation increase in domestic assets, the unemployment rate is expected to increase by 15,634.9300 percentage points. The coefficient for the inflation rate is 3,113.9494. This indicates that for each standard deviation increase in domestic assets, the inflation rate is expected to increase by 3,113.9494 percentage points. The coefficient for the Tadawul All Share Index is 7,727,446.4100. This implies that for each standard deviation increase in domestic assets, the Tadawul All Share Index is expected to increase by 7,727,446.4100 points.

These coefficients provide valuable insights into the relationships between the independent variables and the dependent variables, allowing for a better understanding of how each independent variable influences the economic indicators.

5. Discussion of Findings

The primary aim of this research was to investigate the relationship between investment fund variables and economic growth in Saudi Arabia and to determine the extent to which investment fund variables and external factors influence economic growth and vice versa. The specific objectives of this study were pursued through various statistical analyses and modeling. The first objective of this research aimed to explore the historical trends in investment fund variables and key economic growth indicators in Saudi Arabia from 1998 to 2022. The findings reveal important insights into the relationships and dynamics between these variables, similar to Haryono & Atika (2023), Khathlan (2014), and Marashdeh & Al-Malkawi (2014). The historical trend analysis indicates a gradual increase in both domestic and foreign assets of investment funds over the years. Notable peaks and declines were observed. Domestic assets experienced significant growth around 2005, reaching a peak of 115,661 million Riyals. Foreign assets also exhibited growth, with a peak in 2007 at 25,211 million Riyals. These trends suggest the importance of these assets in the Saudi Arabian investment landscape.

The number of operating funds steadily increased over the 25 years. There was a peak in 2016, followed by a slight decline, and in 2022, there were 255 operating funds. Similarly, the number of subscribers displayed a continuous increase, with a significant surge in 2005. The fluctuations in these variables highlight the evolving landscape of the investment fund industry and the demand for investment opportunities in Saudi Arabia. The second objective aimed to assess the relationships between investment fund variables, external factors (Financial Crisis Period and COVID-19 Period), and key economic growth indicators. The historical trend analysis of GDP reveals a continuous increase over the years, with notable surges and declines. There was a peak in 2008 and continued growth until 2022. This suggests a positive relationship between the number of operating funds and GDP, supporting Hypothesis 1. The analysis shows fluctuations in the inflation rate, with a shift from deflation to inflation around 2002-2007. Notably, a peak in inflation occurred in 2008. This aligns with the hypothesis that external factors, such as the financial crisis, may impact inflation rates, which is similar to the study of Mwakabungu and Kauangal (2023).

Total assets of funds exhibited growth over the years, with fluctuations. A peak was observed in 2005, and there was growth from 2009 to 2021. This implies a positive relationship between total assets and GDP, supporting Hypothesis 1. The unemployment rate fluctuated over the years, with a surge in 2006 and a decline in 2007-2008. It increased from 2009 to 2021, supporting the notion that external factors like the financial crisis may influence employment rates. The third objective sought to build a multivariate model to understand the collective influence of investment fund variables on the Saudi Arabian economy. This model was analyzed using MANOVA, and the results indicated significant impacts on different economic indicators. The findings from the MANOVA analysis, which included standardized coefficients, showed that investment fund variables had a significant collective impact on GDP, the unemployment rate, and the inflation rate (Al-Mahish, 2016; Belloumi & Alshehry, 2018; Bouchoucha & Bakari, 2021). This supports Hypothesis 2 and Hypothesis 3, which propose that investment fund variables influence economic growth and are affected by external factors.

In summary, the findings provide valuable insights into the historical trends and relationships between investment fund variables, external factors, and economic growth in Saudi Arabia. The results support the formulated hypotheses and underscore the importance of investment funds in shaping the economic landscape of the country. These insights can inform policy decisions and investment strategies, contributing to the overall understanding of the Saudi Arabian economy.

6. Conclusion

In conclusion, this study provides valuable insights into the relationship between investment fund variables and economic growth in Saudi Arabia. The analysis of historical trends and correlations reveals the importance of investment funds in shaping the Saudi Arabian economy. The findings support the hypothesis that investment fund variables have a positive relationship with economic indicators and are influenced by external factors. The study highlights the significance of monitoring investment fund variables and their interactions with external factors for informed policy decisions and investment strategies. Policymakers should recognize the role of investment funds in driving economic growth and consider them as important contributors to the nation's GDP. By understanding the dynamics between investment funds and economic

growth, policymakers and investors can better anticipate market changes and contribute to the sustainable growth of the Saudi Arabian economy. However, it is important to acknowledge the limitations of this study, such as the focus on investment fund variables and the reliance on historical data. Future research should consider other factors that influence economic growth and explore the impacts of specific external factors on investment funds. By addressing these limitations, a more comprehensive understanding of the complex relationship between investment funds and economic growth can be achieved, leading to a more resilient and prosperous Saudi Arabian economy. In conclusion, this research contributes to the body of knowledge surrounding investment fund variables and their influence on economic growth. By understanding these dynamics, a more resilient and prosperous Saudi Arabian economy can be worked towards, even in the face of external challenges.

7. Research Limitations

The study focuses on investment fund variables and their relationship with economic growth in Saudi Arabia, excluding other factors like government policies, global economic conditions, and technological advancements. It is based on historical data from 1998 to 2022, which may reflect something other than recent developments. The study relies on secondary data sources, which may need to be revised in accuracy and reliability. It does not consider qualitative aspects of investment funds, such as fund management quality or specific investment strategies. Additionally, it does not explore the impact of different types of investment funds on economic growth separately, which could provide more nuanced insights.

Policy Implications

Investment funds play a crucial role in shaping the Saudi Arabian economy and driving economic growth. Monitoring variables like operating funds, total assets, and subscribers can provide valuable information for policymakers to assess the industry's health and growth potential. Policymakers should consider external factors like financial crises and global economic conditions to mitigate negative effects and ensure industry stability. Investment fund variables collectively impact economic indicators, allowing policymakers to design policies that promote investment fund growth and contribute to overall economic growth. Further research is needed to understand the strategies and mechanisms through which investment funds influence economic growth, which can inform policy decisions aimed at maximizing the positive impact of investment funds on the economy.

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