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-RESEARCH ARTICLE-

THE IMPACT OF DOMESTIC INVESTMENT ON ECONOMIC GROWTH IN SOUTH AFRICA: A SECTORAL APPROACH

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─Abstract─

Examining the impact of domestic investment (DI) in South Africa (SA) over the past decade is crucial because DI is risk-free and less volatile than foreign direct investment (FDI). Despite numerous efforts to attract FDI, the South African economy has experienced economic growth (EG) constraints due to government policy uncertainty. The article investigated the influence of DI on EG in South Africa: a sectoral approach from 1993 to 2020. Overall, panel data autoregressive distributed lag (ARDL) results revealed that DI long-term impacts at least one sectoral output growth in South Africa. This indicates that a rise in sectoral DI substantially affects the expansion of economic output. In at least one of the sectors, we also find that employment, imports, and exports significantly correlate with EG in the long term. A pairwise Dumitrescu Hurlin panel

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Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

causality test reveals that DI does not uniformly cause EG. This is because sectoral development heavily relies on FDI rather than DI in South Africa, resulting in negative homogeneous outcomes. Following the Keynesian theory, where investment is expected to promote economic growth, we must entice DI, which indicates a positive relationship between DI and EC. The new endogenous growth theory of investment can be used to determine the impact of aggregate and disaggregate FDI on sectoral output growth and economic output growth as a whole. The results will enable policymakers and state cooperation to develop progressive economic policies and achieve the Sustainable Development Goals (SDG) and National Development Plan (NDP) objectives. To stimulate sectoral domestic investment and sectoral productive output growth, which can encourage modernized industries, reduce entry barriers, create a labor-intensive environment within sectors, and concentrate on industrial and trade policy to promote export competitiveness.

Keywords: Economic growth; Domestic investment; Sectoral output growth; Panel data ARDL

JEL classification code: E62, F14, E22, E23, E24, O47

1. INTRODUCTION

Active academics and policy researchers have given significant studies over the past decade as to whether or not there is a connection between the increase in domestic investment and expansion in economic production. This is demonstrated by several studies from both the international and the local context (Ayeomoni & Aladejana, 2016; Epaphra & Massawe, 2016; Kalu & Mgbemena, 2015; Manete, 2018; Ncanywa & Makhenyane, 2016; Zamilur & Ferdaus, 2021), which highlight the significance of investment flow to improve economic growth and employment in South Africa, as well as an individual country and cross-country studies. DI refers to private and public capital formation, which can appear in structural improvements such as public infrastructures, education, health, and communication projects (PWC, 2021). These projects all play an important role in raising production in the economy. According to the findings of a variety of studies, the role of domestic investment in every sector of the economy in the 21st century comprises essential components that have the potential to stimulate economic expansion. For instance, to show the essential function of sectoral direct investment, Kolisi (2021) suggests that manufacturing sector investment is a substantial engine for economic development and progress, provided all other factors remain the same. This helps to illustrate the pivotal role that sectoral direct investment plays. Manete (2018) and Bakari (2017b) stated that domestic investment significantly impacts economic output growth performance. This finding is consistent with their results. According to certain other research investigations, the essential framework of sustainable economic development over the long term is the systematic organization

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

and expansion of gross capital formation within economic sectors. And this strategy can be successful by reducing entry barriers and resolving distorted patterns of capital ownership through increased competition and the expansion of small businesses. In a similar vein, by emphasizing labor-intensive growth in industries like agriculture, mining, manufacturing, and construction, as well as the financial services sector, while simultaneously improving export competitiveness (IDC, 2021a).

The economic expansion of South Africa has been subjected to a great deal of strain. It entered a period of economic contraction in late 2019, which continued into 2020 as a direct result of the COVID-19 epidemic (Market Insight, 2021). The current course of the economy is considered unsustainable because output growth is slowing in most economic sectors. The EG reached a standstill, the government's debt climbed, the unemployment rate increased, and the level of inequality remained high. Electricity shortages and load shedding might be anticipated in the not-too-distant future; hence, companies might find it necessary to ensure that they have access to a consistent supply of energy (Market Insight, 2021). Every significant risk-rating agency has given South Africa a poor investment grade. Therefore, policy measures to enhance domestic investment in economic sectors can create the conditions for stronger and more long-term sustainable economic growth in South Africa (Market Insight, 2021).

According to IDC's projections for the year 2021, sectoral foreign direct investment is seen as a growth driver. However, governments should work hard to avoid becoming dependent on foreign investment to fuel output development because of the associated FDI risk that could harm South Africa's economic performance. These risks include overall political risks related to a lack of government policy implementation, lack of administrative efficiency, lack of judiciary services, economic sanctions, inflation risk, financial crises, and regulatory policy effectiveness, all of which are causes for concern among international investors (WIR, 2020). These issues can be detrimental to the economy's performance, such as the inability to create jobs as a consequence of international investors requiring migration of their workforce to South Africa rather than using local labor because of South Africa's inadequate supply of skilled workers (WIR, 2020). Despite this fact, foreign direct investment has played a significant part in the growth of South Africa's economy. In recent years, foreign direct investment in South Africa has remained at a low level, especially compared to the economic performance of other developing market countries. Foreign investors are not interested in supporting the expansion of domestic businesses. According to IDC's projections for the year 2021, the private sector is projected to maintain the general progress made in the domestic investment movement. According to IDC (2021b), South Africa needs to prioritize economic policies that can attract the supply of sectoral DI into given specific sectors such as agriculture, forestry and fishing sector, and construction sector, which contributed low specifically to real GDP and sectoral output growth in the 2020 period. These sectors include agriculture, forestry

and fishing sector, and construction sector. Also, prioritizing the supply of sectoral DI in industries like mining and manufacturing and financial services, real estate, and business services, which do well in an environment with low savings, can increase the growth of sectoral output. This can also improve the potential for domestic sectoral investment in the mining and quarrying industry, which is important given the recent rebound in commodity prices (IDC, 2021b).

The primary reason this study is significant is that most of the currently available research in South Africa has mostly focused on analyzing the influence that FDI plays on growth. Because there is no risk involved and it is less volatile compared to foreign investment, it is of utmost relevance to investigate the effects of direct investment. Studies quite similar to this have been carried out in South Africa (Masipa, 2018; Mothibi & Ferreira, 2019; Nchoe, 2016; Sunde, 2016). These studies investigated the impact that foreign direct investment (FDI), investments, and gross fixed capital formation (GFCF) inflows have on economic growth and sectoral analyses in South Africa. The empirical findings of this research demonstrated that FDI inflows have various effects on different sectors. For example, FDI inflows typically do not affect the agriculture sector, whereas FDI inflows benefit the growth of the industry and services sectors. The research design method utilized for these investigations included the application of estimate models such ADRL and causality analysis, vector error correction, and the Granger causality approach model to evaluate the short-run and long-run relationships between the variables for South Africa. The primary conclusions are that economic growth has a favorable association with foreign direct investment (FDI) while sharing a negative long-run relationship with government expenditures. The South African economy has suffered limits on economic growth despite the numerous actions taken by the government to entice foreign direct investment (FDI). These limits are the result of policy uncertainties. This results in poor performance across sectors, decreasing investment conditions, and sluggish overall growth. Especially in the case of South Africa and other developing countries, policymakers are faced with the difficult decision of whether or not to place a greater focus on foreign direct investment (FDI) or domestic investment (DI).

In the current study, the researchers want to determine whether their findings will be similar to those in earlier research that focused on foreign direct investment and economic expansion. The support of the accelerated growth model of investment, which had been adapted from the Keynesian model, neoclassical theory, the Tobin-Q theory of investment, and the new endogenous theory of acquisition, will be utilized in the study. To observe the influence of domestic investment on sectoral production and achieve optimal advantages for economic growth, the adoption of panel unit root tests in conjunction with panel cointegration tests is essential. According to Manete (2018), the increase in domestic investment will create more jobs within the nation. The significance of this study lies in the fact that it establishes the role that domestic

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

investment plays in the expansion of various sectors of South Africa's economy. The study will provide a fair evaluation of the environment for sectoral domestic investment to make projections regarding South African production growth. The results will allow policymakers and state collaboration to create progressive economics policy drafting to meet Sustainable Development Goals (SDG) and National Development Goals (NDP). IDC argues that the economic transformation strategies of the 21st century need to encourage domestic sectoral investment and growth in sectoral productive output, both of which have the potential to increase labor intensity and international competitiveness (2021a).

As a result, this study aims to determine how much sectoral domestic investment contributes to sectoral productivity in South Africa, taking into account the impact that sectoral-specific output growth has. Therefore, the findings will provide policymakers, such as the National Treasury and the South African Reserve Bank, as well as industrial corporates, with information that will allow them to decide whether or not to implement an economic policy that might encourage the attraction of sectoral domestic investment to certain specific sectors, which will boost sectoral output growth in South Africa. Therefore, the government's economic policy will be able to select whether or not to pursue programs to attract domestic investment. In light of what has been discussed above, the purpose of this study will be to investigate the impact that sectoral domestic investment has on the growth of output in specific sectors of the economy of South Africa (SA). The following is how the study is organized: Section 2 offers an overview of domestic investment and sectoral economic growth in South Africa. Section 3 includes a review of the relevant literature. Sections 4 and 5 provide the methodology, theoretical framework, and results. Section 5 provides a discussion of the findings. The study's conclusion and its policy implications are presented in Section 6.

2. OVERVIEW

Over the course of the previous few decades, South Africa has been plagued by a lack of predictability in the flow of its various forms of domestic investment (SARB, 2021). This was influenced by accepting and implementing multiple economic policies to increase domestic investments, reduce unemployment, alleviate poverty, and increase economic growth. These policies include the Reconstruction and Development Programme (RDP) from 1994 to 1996; the Growth, Employment, and Redistribution Programme (GEAR) from 1996 to 2006; the Accelerated and Shared Growth Initiative South Africa (ASGISA) from 2006 to 2010; the New Growth Plan (NGP) from 2010 to 2012; and Natal Growth and Development Strategy (The policies mentioned above have the goals of fostering an increase in domestic investments, lowering unemployment rates, easing the burden of poverty, and fostering economic expansion).

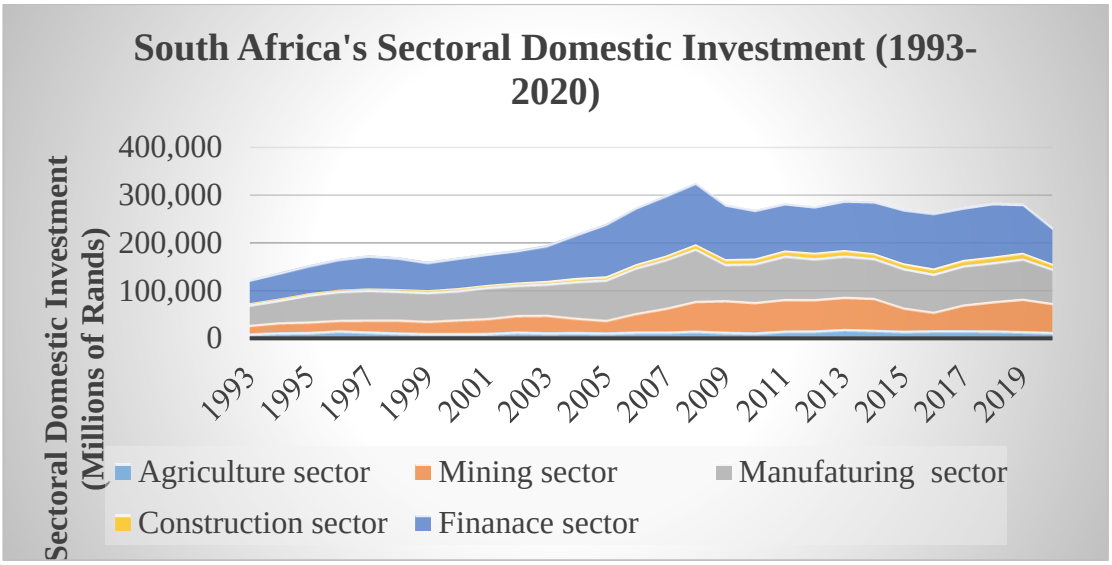
Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

The patterns of sectoral domestic investments are presented in Figure 1, which includes the following industries: agriculture, forestry, and fishing; mining and quarrying; manufacturing; construction; and the finance, real estate, and business services sector. The various contributions made by different industries to the total sectoral domestic investment are broken down and displayed in Figure 1 for the years 1993 to 2020. The financial sector accounted for 39 percent of the total sectoral domestic investment flows. The manufacturing sector recorded 33 percent, the mining and quarry sector recorded 19 percent, and the agricultural, forestry, and fishing sector recorded 6.5 percent of the total. The finance sector was the sector that made the largest proportional contribution to the overall percentage. With only 2.9 percent of the total aggregate sectoral domestic investment, the construction industry is the sector that makes the least contribution (SARB, 2021). Assuming an aggregation of given pacific sectors, the overall sectoral domestic trend from 1993 to 2020 recorded a gradual annual average rate of approximately 1.4 percent. This rate represents a gradual increase over time. The graph demonstrates that certain given industries are subject to abrupt fluctuations and stable declines, which influence aggregate patterns in sectoral domestic investment. As a result of disinvestments in the early 1990s caused by the political isolation caused by the apartheid government, aggregate sectoral domestic investment experienced a loss of R123 390 million in 1993 (Adrino, 2012; SARB, 2021).

The effects of the 1997/1998 Asian currency crises caused noticeable changes experienced throughout the period 1997 to 2000, ranging from R174 009 million to R169 268 million (Adrino, 2012; SARB, 2021). The patterns in the data demonstrate that aggregate sectoral domestic investment has been steadily decreasing from R 325 873 million to R 269 058 million from 2008 to 2010; this drop may be seen. This is because of the global economic crisis that occurred during the latter half of 2008 and all of 2009, which affected the volumes of capital investment, caused export volumes to fall, and resulted in fluctuating sectoral output growth (Adrino, 2012; SARB, 2021). From 2011 to 2016, aggregate sectoral domestic investment went through another sharp shift, moving between R 283 090 million and R 262 825 million. This was one of several rapid shifts that occurred. This is a result of the greatest drought effects, which affected the trust of local investors in investment, and possible rises were ascribed to the preparation for the FIFA 2010 Soccer World Cup (IDC, 2016; SARB, 2021). Again, South Africa's economic growth has been subjected to tremendous pressure, and from 2018 to 2020, the country's aggregate domestic investment decreased from R283 123 million to R231 153 million. The pandemic produced unsustainable domestic investment commitments, which led to a continual reduction in domestic investment (SARB, 2021). The Covid-19 virus triggered this. As a result, the graph demonstrates that certain industries have much higher levels of sectoral domestic investment compared to other industries, as was discussed previously (IDC, 2021b; StatSA, 2021b).

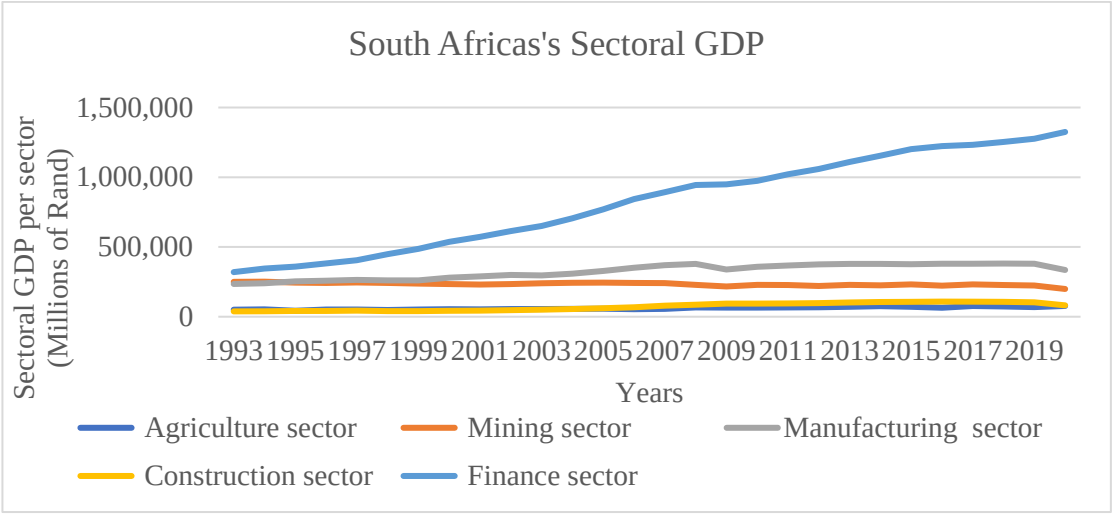
Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

Figure 1: Sectoral domestic investments in South Africa (1993 – 2020)



Source: South African Reserve Bank (2021)

Figure 2: South Africa's sectoral real GDP contributions (1993 – 2020)



Source: South African Reserve Bank (2021)

The patterns in the various sectors' output growth rates from 1993 to 2020 are shown in Figure 2. According to the data presented in the graph above, the sector that contributes the highest to the overall trend of rising sectoral production is the financial, real estate, and business services sector. This sector is responsible for 54 percent of the total contribution. This is followed by the manufacturing sector, which contributes 21

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

percent; mining and quarrying, which contributes 15 percent, construction, which contributes 4.7 percent; and the sector that contributes the least, which is agricultural, forestry, and fisheries, which contributes 4 percent of the aggregate sectoral production increase. The overall sectoral output growth trend from 1993 to 2020 is also accounted for in the graph presentation, which may readily explain the quantifiable yearly average growth rate of around 2.1 percent, presuming an aggregate of given pacific sectors. Some particular industries go through rapid variations, which in turn cause fluctuations in the aggregate patterns of industry output growth. As a result of the global economic crisis in the later half of 2008 and throughout 2009, these shifts occurred during 2008-2009, when the total decreased from R1 705 501 million to R1 664 534 million. This has resulted in a decrease in the volume of capital investment, a fall in the volume of exports, and a fluctuation in the growth of sectoral production (SARB, 2021; StatSA, 2021a). As a result of the present economic trajectory brought on by the COVID-19 pandemic, the total GDP witnessed another dip from 2019 to 2020, falling from R2 050 978 million to R2 017 565 million. This was because the output growth of certain economic sectors was slowing down. A rise in the flow of capital investment has led to an improvement in sectoral productivity, which has driven a good recovery in consumer spending (SARB, 2021; StatSA, 2021a). This recovery in consumer spending is partially due to the progressive expansion in the output of the world economy, as well as the liberalization of financial markets (SARB, 2021; StatSA, 2021a). SA's progressive macroeconomic policies, such as (RDP, GEAR, ASGISA, NGP, and NDP) did not nearly reach their projected aims to eliminate poverty and unemployment, boost sectoral production growth, and attain an annual real GDP rate of 6 percent by the year 2020 (SARB, 2021; StatSA, 2021a). Domestic investment's effect on the growth of certain sectors' production has been erratic (IDC, 2021a). To avoid a slow sectoral production growth rate, investors will most likely relocate their capital to the areas where they believe it will be employed most effectively.

3. LITERATURE REVIEW

The pandemic induced by the COVID-19 virus, which also impacted South Africa's economy, caused a serious crisis that the global economy is currently recovering from. According to the World Investment Report (WIR), which will be published in 2020, it is projected that South Africa's new industrial revolution and the policy change toward domestic investment will have a significant impact on the growth performance of various sectors. For several decades now, the policies for development and industrialization have depended on increasing economic output growth performance by attracting foreign direct investment (FDI) (WIR, 2020). It has been demonstrated that foreign direct investment (FDI) benefits do not immediately and uniformly accrue across all nations, industries, and communities (IDC, 2021b). Because of this, the grounds for this study are explored to advocate the necessity of stimulating sectoral domestic investment, which can substantially impact the growth of sectoral output. To

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

bridge the gap in sector production, it is essential to address the challenge posed by the slowdown in sectoral FDI and consider sectoral DI as an alternative. As a result, sectoral DI is typically regarded as a factor contributing to the expansion of sectoral production. According to the research that has been done, which will be described further down, it may be more effective to target specific industries within the economy that have positive externalities. In light of the difficulties associated with FDI, it is obvious that an investigation of the part that DI plays in boosting output inside the local economy should be carried out.

The empirical studies that were looked at were based on the neoclassical growth theory developed by Robert M Solow (1956), the new endogenous growth theory, and the Keynesian theoretical framework. These theories and frameworks suggest that investment contributes to economic growth through capital accumulation and positively impacts production and output growth (P. M. Romer, 1992). The studies based on empirical evidence investigate the factors that influence gross fixed capital formation (GFCF) spending. The research makes use of a variety of economic theories that can be used to identify the affected factors. In addition, the investigations attempt to assess the degree to which macroeconomic and microeconomic variables affect or are influenced by a GFCF that changes the impact of aggregated and disaggregated economic growth. The following are several studies conducted in South Africa, other developing nations, developed countries, and various locations throughout the world to investigate the influence of domestic private and public investment and the contribution of sectoral domestic investment to economic growth. Several empirical research has been conducted with the primary objective of determining the factors that influence the relationship between GFCF in economic sectors and the EG of the country.

According to an analysis by Hussin and Ching (2013), the manufacturing, agriculture, and service sectors all suggested a correlation between the three industries and GDP per capita. Additionally, the authors found that different sectors contribute uniquely to the expansion of the national economy. Because certain economic sectors have been demonstrated to benefit national economies, countries can anticipate significant returns on any capital invested in those specific economic sectors. Although many studies, including South Africa, developing and developed countries, and others were examined (Bakari, 2017c; Epaphra & Massawe, 2016; Feddersen, Nel, & Botha, 2017; Kalu & Mgbemena, 2015; Manete, 2018; Ncanywa & Makhenyane, 2016; Nchoe, 2016; Pradhan, 2011), which have proven that there is a significant relationship between sectoral domestic investment in economic sectors and aggregate economic growth.

The research examined makes it abundantly clear that investments play a key role in the economy's expansion. The effect of sectoral domestic investment on output growth is distinct from the influence of change brought about by foreign direct investment. Some research, such as that done by Masipa (2018), Mothibi and Ferreira (2019), and Sunde

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

(2016), examined the relationship between sectoral foreign direct investment (FDI) and sectoral domestic investment as a proxy. They found that FDI inflows do not typically affect the agricultural sector in the same way that they affect the growth of the industry and services sectors. As a result, the influence that sectoral DI would have on the increase of sectoral production would be distinct from that of FDI. One of the most significant problems with the research is that most empirical literature has not looked at the common economic sectors.

A long-run positive correlation exists between domestic investment, economic sectors, and economic growth (GDP), which varies among countries; hence, investment in certain economic sectors will provide large returns to the country. The empirical results that were reviewed and depicted below prove that this correlation exists. Although economic sectors' impact differs from industry to region and country, this is not always the case. For instance, the mining, agricultural, manufacturing, and infrastructure development sectors have different effects on one another. In the short run, domestic investment in the financial industry has been shown to considerably impact economic growth, according to an average result across all of the monitored countries. The contribution of sectoral domestic investment is the reason for the increase in employment and the increase in export and economic development. The research that has been done on this topic has placed a strong emphasis on the significance of both private investment and public spending on individual industries. On the other hand, there should be a limit placed on the amount of money the government spends because spending more than necessary will hinder investment in the private sector (Ahmad & Qayyum, 2008).

These are studies that have analyzed the position of "domestic investment on economic growth," and they include, amongst others, Zamilur and Ferdaus (2021), who investigated the "impacts of domestic savings and domestic investment on the economic growth of Pakistan using annual data spanning from 1973 to 2018," as mentioned previously. According to the empirical research findings, there is a connection between increased levels of domestic investment and rising levels of economic output in Pakistan. In a similar vein, the research conducted by Kalu and Mgbemena (2015), Ayeomoni and Aladejana (2016), and Bakari (2017a) all concluded that there is a correlation between growth in production and domestic investment over the long run. du Toit and Moolman (2004) researched the significance of investment on gross domestic product. According to du Toit and Moolman (2004), gross fixed capital formation boosts a nation's production volume, reduces fluctuations in employment levels and income, and enhances the overall quality of life. This occurs because GFCF stimulates demand for capital products. According to the study's findings, the long-run GFCF in South Africa may be calculated using the neoclassical method. In this method, investment is utilized until the cost of investment is equivalent to the marginal productivity of investment. According to du Toit and Moolman (2004), nations with low levels of investments have a lower probability of achieving high GDP rates.

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

Epaphra and Massawe (2016) conducted research in Tanzania between 1970 and 2014 to determine whether or not there are correlations between domestic investment, government spending, foreign direct investment, and the growth of GDP. An updated version of the neoclassical model was used in the research project to do the correlation analysis between domestic investment and GDP expansion (Epaphra & Massawe, 2016). The research also looked at several different theories on investment, including the accelerator theory of investment, the neoclassical theory of investment, and the new growth model. The estimate methods utilized in the regression and diagnostic tests included the Jacque-Bera-normality test, the LM test, the heteroskedasticity test, and the RESET regression errors specification test. The results demonstrate a considerable association between domestic investment and economic growth in Tanzania.

Another significant study is the one that was conducted by Manete (2018). This study takes a sectoral approach to analyzing investments' impact on economic growth and employment in South Africa. The research used quarterly data from 1994 up until 2016. The study investigated the investment concept to provide empirical support for the claim that investment is important in determining structural change and gross domestic product. The theories of economic growth take into account the effects of factors such as capital, labor, and technological advancement on gross domestic product. The ARDL model was also applied to determine how the growth of production and employment is affected by the level of sectoral investment. According to the study's findings, there is no association between the elements in the short term. The results also indicated that the Granger causality test suggests a bidirectional relationship between investment in the finance sector and the mining sector to economic growth and that there is a unidirectional association between investment in the finance sector and the manufacturing sector to employment. These findings were revealed due to the analysis of the test results. Feddersen et al. (2017) used a quarterly time data series to investigate the relationship between exports, domestic investment, and economic output growth in South Africa from 1975 to 2014. Their research covered the period from 1975 to 2014. The neoclassical method was utilized in the research project to demonstrate how the impact of a domestic investment would have on South Africa's GDP rate. The VECM Johansen's cointegration test and the Granger causality test are two of the estimate methods utilized in this research. The study's findings demonstrate that increasing exports promote a rise in gross fixed capital formation and ultimately results in a higher GDP rate in the short term. On the other hand, a high growth rate in gross fixed capital creation can significantly contribute to a high rate of GDP expansion over the long term.

According to the empirical findings of a study conducted by Adams (2009) between 1990 and 2008 in sub-Saharan Africa, there was a substantial link between gross fixed capital formation and GDP. Ongo and Vukenkeng (2014) researched to investigate how the GFCF affected the rate of production expansion in the CEMAC sub-region. Their research, which used methodologies including ordinary least squares, found that gross

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

capital formation had a substantial association with economic growth and infrastructure development. This was one of their main findings. The empirical research on domestic investment in particular sectors of the economy covers, among other important elements that can inspire economic growth, public expenditure, and investment inflow. These are some examples. According to the findings of Kolisi (2021), an analysis of the manufacturing sector, it is widely acknowledged that domestic investment is a substantial driver for economic development and growth in many economies, provided that all other factors remain unchanged. This study examined the relationship between foreign direct investment (FDI) in South Africa's manufacturing sector and overall GDP growth from 2006 to 2018. The level of trade openness, domestic investment, price rise, and currency exchange rate were all included as additional variables in the study. The ADF and Phillips–Perron tests were utilized in the stationarity analysis for the data. In the empirical research, an approach known as the "autoregressive distributed lag model" was applied to investigate the long-term correlation between the variables.

Meyer, Manete, and Muzindutsi (2017) investigated the impact on the expansion of South Africa's gross domestic product of South Africa's government spending and sectoral domestic investment. The financial crises that occurred in 2008 and 2009 harmed GDP growth not only in South Africa but also internationally. The primary contributors to the economy's expansion were government expenditures and gross fixed capital formation. From 1995 to 2016, quarterly analyses were performed using the VAR model of econometrics as one of the techniques for analyzing the impact of government spending, sectoral gross fixed capital formation, and GDP growth. The affected economic sectors include the mining, manufacturing, and financial sectors, among others. According to the results of the VECM, there is a positive association between South Africa's domestic investment in the financial industry and the country's GDP growth in the short run. The results showed a considerable association between overall domestic investment in various sectors and the manufacturing industry over the long run.

On the other hand, the significance of government spending to the expansion of GDP was less. Because of this, a greater proportion of domestic sectoral investments must be made in the private economic sectors. Nchoe (2016) researched the impact of foreign direct investment (FDI) and domestic investment inflows on economic growth. The study was a sectoral analysis of South Africa's economy from 1970 to 2014. Empirical studies reveal that foreign direct investment (FDI) inflows affect different sectors. In this instance, FDI inflows do not typically affect the agriculture sector, but they do affect the growth of the industry and services sectors. Compared to agriculture and manufacturing, the services sector receives more foreign direct investment (FDI). Masipa (2018) evaluated the association between foreign direct investment and economic growth in South Africa by doing a vector error correction analysis from 1980 to 2014. The period covered by this study was from 1980 to 2014. The vector error correction model was utilized as the research design approach for these investigations so that an evaluation of the short-run

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

and long-run relationships between the variables could be carried out. According to the findings, it was discovered that economic growth has a positive link with both foreign direct investments (FDIs) and the real effective exchange rate but that it has a negative relationship with government expenditures over the long run.

Mothibi and Ferreira (2019) conducted a study in which they applied an ARDL analysis to determine that FDI and DI were the primary drivers of economic production growth in South Africa from 1994 to 2018. Despite its seemingly endless efforts to entice FDI investment, the economy has been held back from expanding further due to the government's inability to provide clear guidance regarding its strategy. This results in poor performance across sectors, decreasing investment conditions, and sluggish overall growth. Especially in the case of South Africa and other developing countries, policymakers find themselves in a difficult position when deciding whether to prioritize foreign direct investment (FDI) or domestic investment (DI). The research that was conducted by Sunde (2016) looked at foreign direct investment, exports, and economic growth in South Africa from 1990 to 2014. It also did an analysis of ADRL and causality during the period. The error correction model and the VECM Granger causality approach investigate the direction of causality and cointegration between economic growth, foreign direct investment, and exports. The error correction model evaluates the short run, while the VECM Granger causality approach investigates the short run.

Emmanuel and Oladiran (2015) investigated the connection between increases in government spending on capital projects and products from the manufacturing sector in Nigeria. According to the study's findings, there is a meaningful connection between the level of government spending and the manufacturing industry. The report also suggested that larger sums of public expenditure should, as a result, be allocated to the capital component. This assumption is strengthened by the endogenous growth theory, which considers factors contributing to gross capital formation and includes research and development, education, and infrastructure. Time-series data were utilized by Hussin and Ching (2013) to investigate the impact that various economic sectors have had in Malaysia, China, and India. They examined the production sector, the agriculture sector, and the service sector as well. According to the findings, there is a connection between the three industries and the total amount of gross fixed capital investment in those industries, which will result in significant returns for the nation.

The research conducted by Pradhan (2011) looked at the effect of capital investment on the trade of mineral resource-led growth theory in three countries — namely, Australia, Canada, and Israel — from 1965 to 2009. These countries were chosen because they experienced rapid economic expansion during this period. In the study, panel cointegration and causality testing were utilized. According to the empirical findings, the accumulation of gross fixed capital in the mining and manufacturing industries was found to have a cointegration relationship with economic growth. The study's findings

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

also showed a connection between the export of mineral resources and the rise of GDP, as well as unidirectional causation from economic development to domestic investment. This was one of the key takeaways from the research.

4. METHODOLOGY

4.1. Theoretical framework and model specification

Studies based on data and evidence reveal that different criteria are substantial enough to attract domestic investments in various sectors. When describing the effects of sectoral domestic investments on aggregate output growth and sectoral output growth, the observations of many research from South Africa, established nations, and developing economies have proven helpful. Theories of aggregate economic growth, such as the accelerator theory of investment and the neoclassical investment model, describe the various applications and effects of factors that attract sectoral domestic investment flows in driving aggregate output growth. These theories include the neoclassical model of investment. The multiple applications and products of factors that attract sectoral domestic investment flow in stimulating sectoral output growth are explained by structural growth theories such as the Clark –Fisher model from the 1940s, the balanced growth theory from the 1950s, and the new endogenous model from the 1980s. These models consider the impact of sectoral investment on sectoral output growth.

The new endogenous growth theory has been demonstrated to be the structural growth theory that is the most compatible with the high demand for labor intensity and technological advancement in the present day and age. Therefore, the new endogenous growth model about sectoral growth or structural change theories is well suited for South Africa's developing economy as it supports some arguments of the balanced growth model. One of these arguments suggests that the government should simultaneously attract capital flow investment to several sectors to increase market size and productivity and provide incentives for private investors.

The accelerator theory of investment, which the Keynesian model of the multiplier influenced, provides the foundation for understanding investment's function in fostering growth within the context of the domestic economy. According to the model, there is an inverse relationship between the amount of money invested and the amount of money earned. Clark was the one who came up with the idea for the acceleration model (Rothbarth, 1941), and Samuelson (1939) was the one who first used it to define a linear relationship between investment and output growth in the context of a business cycle. According to the model, an increase in one's level of income will lead to an increase in one's level of consumption, which will then lead to a rise in one's level of productivity. As a result, according to the accelerator investment hypothesis, there is a constructive relationship between growing levels of investment and revenue.

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

According to Robert M. Solow (1962), the neoclassical theory of investment attempts to explain the gross domestic product as being impacted by investment and quicker technology advancement, which boosts aggregate productivity. The equation that describes capital investment accumulation on the hypothesis of a constant savings rate as a function of labor supply and output within the context of an exogenous rate of labor force growth is at the heart of the neoclassical theory of investment. This equation is contained inside the neoclassical theory of investment. According to the neoclassical growth theory developed by P. Romer (1993); Robert M Solow (1956), an increase in the number of domestic savings plans leads to a high level of productive output growth by contributing to the construction of a larger pool of gross fixed capital. This makes it possible for a faster-moving accumulation of physical capital assets, which will fuel the rise of economic output. Tobin's Q theory of investment is founded on the neoclassical investment theory. This theory assumes that the market value of the capital assets ratio is the primary driving factor behind capital flow investment and output growth. Tobin's theory of investment is based on this idea.

According to the various theories on structural change, there are about three theoretical aspects of structural change. These aspects include the following: Clark and Fisher's theory displays the structural change model as a broader economic process that covers all conceivable changes in structural productivity, employment, and between all sectors of the economy, including the birth of new industries and the withdrawal of existing sectors. This model also accounts for the fact that the structural change model is a model. Fisher in 1935 and Clark in 1940 independently devised what is now known as the Clark–Fisher model. According to the Clark-Fisher model, as industries and occupations advance, a proportion of activity in the primary sector (which includes agriculture, forestry, mining, and fishing) steadily decreases; a proportion of activity in the secondary sector (which includes manufacturing and construction) grows until it reaches a certain level, at which point it either stops growing or begins to decline slightly; and a proportion of activity in the tertiary sector (which includes trade, finance, and services) seems to grow steadily. As a result, an increase in the proportion of the workforce employed in providing services may result from higher levels of income per capita. The sectoral growth followed the structural growth in the primary and secondary sectors in the service sector, which was driven by the sectoral output progress. His argument is handled from both the supply and demand sides of the market, which is consistent with the balanced growth hypothesis that Little (1962) favored. He contends that the vicious cycle of poverty is the primary impediment to productivity in nations still in industrialization. The vicious cycle of poverty demonstrates that low income in developing countries leads to low domestic savings levels, further perpetuating the cycle. A decrease in domestic savings leads to a reduction in domestic investment, which causes a decrease in productivity. A decrease in productivity leads to a loss of production, which generates lower revenue and decreases demand for commodities.

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

The new-endogenous model is described as a multi-product endogenous economic output growth technique by Gabardo, Pereima, and Einloft (2017). This follows the findings of the researchers mentioned above. Alterations in technology contribute to an explanation for the gap that exists between some rich countries and some impoverished countries. It offers a technique via which information and technology can be explained organically. To put it another way, technological advancement will give rise to a new branch of research and development, which, in turn, will cause an increase in the level of sectoral production innovation represented by the equation Yt = F (Kt, Lt, Tt). According to P. Romer (1993), these technologies will assist in producing capital goods and bring about competitiveness. As a result, the new endogenous growth model does provide a pointer to the impact of sectoral investment on sectoral output growth or the ability to disaggregate analyses. The new endogenous growth model, which developed in the 1980s as an alternative to the neoclassical growth theory and had its arguments pushed forward by the works of P. Romer (1993), is the foundation for the model that was estimated in the study. This model was based on the new endogenous growth model in the 1980s. As a result, the new endogenous growth model, which refers to sectoral growth or structural change theories, is a good fit for the developing economy of South Africa because it supports some of the reasons made by the balanced growth model. The model explains the positive correlation between increasing levels of sectoral investment and rising levels of sectoral output (Ghali, 1999). According to the new endogenous growth model, an increase in domestic sectoral investment has a considerable bearing on the expansion of economic production. Endogenous growth economists are of the opinion that advances in productivity can be directly linked to increased rates of innovation as well as increased investments in human capital. When resources are distributed to productive areas of the economy, this may affect domestic investment. This demonstrates that investment in the national economy is not sufficient, and as a result, emerging economies are reliant on foreign direct investment (FDI) inflows to increase their investment rate (Adrino, 2012). According to the new endogenous growth model, it is crucial to attracting domestic investment and savings to stimulate technology and productivity, both of which can favorably influence the sectoral output growth rate (Adrino, 2012).

The panel data regression model analysis for equations 1 and 2 is observed based on the cross-sectional units, which represent a sample of sectors surveyed over time (Baltagi, Feng, & Kao, 2012; Gujarati, 2004; Hill, Griffiths, & Lim, 2008), and new endogenous growth model framework advanced by P. Romer (1993), as well as several empirical studies discussed in section 3 such as Kopeledi (2020), Manete (2018), Masipa (2018), Bakari (2017d) and

$$RGDP_{it} = a_0 + B_1DI_{it} + B_2EMP_{it} + B_3LCit + (B_4XP01_{it} - B_5IMP_{it}) + B_5EXHt + \varepsilon_{it} \quad (1)$$

Where: the multivariate equation is estimated as follows, using natural logarithm form:

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

$$InRGDP_{it} = \beta_0 + \beta_1 InDI_{it} + \beta_2 InEMP_{it} + \beta_3 InLC_{it} + (\beta_4 InXP01_{it} - \beta_5 InIMP_{it}) + \beta_6 InEXH_t + \varepsilon_{it} \quad (2)$$

Where: In $RGDP_{it}$ = sectoral specific real GDP (t)
β_0 = Constant
β_1 In DI_{it} = Domestic investment per sector at the period (t) (Gross Fixed Capital Formation)
β_2 In EMP_{it} = Employment per sector at the period (t)
β_3 In LC_{it} = Labour cost per sector at the period (t)
β_4 In $XP01_{it}$ = Export per sector at the period (t)
β_5 In IMP_{it} = Import per sector at the period (t)
β_6 In EXH_t = Real Effective Exchange rate index at the period (t)
Where, β_1, β_2, β_3, β_4, β_5, and β_6 are coefficients to be estimated, and εit is the error term.

4.2. Definition of variables and a priori expectations

In explaining the variables, references are made to the Keynesian theory and additional arguments of the new endogenous theory supported by P. Romer (1993). This is done to justify the variables' relevance to the study. The real GDP is calculated by adding up all the money spent and earned in the economy. The real gross domestic product (GDP) is the entire value of final goods and services (G&S) created by the economy over a certain period. It is an endogenous variable that is utilized in the process of measuring the performance of the economy. According to Masipa (2018) and Manete (2018), the panel data model has a dependent variable represented by the real GDP. Gross Fixed Capital Formation (GFCF) is the metric that is used to measure DI. It is anticipated that there will be a beneficial association between domestic investment and economic growth. This is consistent with the Keynesian theory, which states that more investment should increase GDP. In economic theory, the term "investment" refers to purchasing fixed assets (such as machinery and buildings that house components of production) in addition to stockpiling commodities. This action will increase the total quantity of finished goods and services manufactured within the economy. According to Epaphra and Massawe (2016), Ncanywa and Makhenyane (2016), and Manete (2018), a rise in the level of investment is believed to increase employment, productivity, and living standards and ultimately contribute to a reduction in inequality. Employment is the primary factor in determining EMP because it is the driving force behind production and profitability. Employment levels and the growth rate in economic output may have a negative or positive connection.

Employment of labor, much like investment, is thought to stimulate production output in an economy (Manete, 2018; Masipa, 2018). This follows the Keynesian idea. A marginal and an average cost of labor are both represented by LC. Workers are assumed to be paid an average wage per week when calculating the marginal labor cost. This is because the marginal cost of labor measures the change in total labor costs that results

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

from employing an additional worker. According to the Keynesian literature, labor cost is a metric for the equal ratio between labor remuneration and labor input per hour, also known as labor productivity. According to Masipa (2018), one might anticipate either a negative or a positive link between the growth of labor costs and economic production. XP01 represents exports. According to Keynesian theory, exports are exogenous variables that are anticipated to contribute aggregate demand (AD) to a nation's production output, which is anticipated to be consumed worldwide. If consumers want more exports, businesses will hire more workers, leading to an increase in national income and overall consumption. It is anticipated that there will be a negative/positive link between the rise in exports and the growth of economic output (Feddersen et al., 2017; Mothibi & Ferreira, 2019). IMP symbolizes Imports.

Imports, in Keynes's view, constitute endogenous variables and factors because they are generated outside of the country or internationally and are anticipated to be consumed within the nation. There can be a negative or positive link between the rise of imports and economic production. This is consistent with the findings of several research, including (Feddersen et al., 2017; Mothibi & Ferreira, 2019). The actual effective exchange rate, abbreviated as EXH, measures how much one country's currency is worth when converted to and exchanged for other currencies worldwide. According to the research published in economics, a rise in the value of the native currency will eventually make the purchase of goods and services produced in other countries more affordable. According to Masipa (2018), one may anticipate that the exchange rate would have either a negative or a positive relationship with the rise of economic output.

4.3. Data source

This analysis utilizes annual data collected from SARB and StatsSA data sources. The data came from mining, quarrying, agricultural, forestry, fisheries, manufacturing, construction, finance, real estate, and business services industries. The extent of the data is from 1993 to 2020.

4.4. Estimation techniques

Given the nature of the variables and the existence of cross-sections over time, the study employed panel data or longitudinal data techniques. According to Kopeledi (2020), when discussing Hsiao's (2007) model, panel data or longitudinal data consists of two data components: the time series component, where the time series or period is represented by (t), and the cross-sectional component, which is denoted by (i) and represents various sectors. The panel data set has demonstrated several advantages over time series and cross-sectional data models, particularly in light of the data to be analyzed in this study. For example, the cross-sectional units in this study represent a sample of sectors surveyed over time. This means that data is aggregated across industries and time. This demonstrates a time series and

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

cross-sectional data dimension. For instance, we have had the GDP, DI, EMP, LC, XP01, and IMP for sectors (agriculture, forestry, and fishery; mining and quarry; manufacturing; construction; and finance, real estate, and business services sector) over 28 years. The observation for the panel dataset is also known as the observation for cross-sectional data and the observation for the time series dataset, in which the reaction of sectors over time is detected (Hill et al., 2008). The application of the accepted panel data approach considers the pre-test and the procedure for determining the acceptable method for panel data regression for all related panel dataset types. The estimation procedure will therefore prioritize the panel unit root test, panel cointegration tests, and the panel data long-run model (ARDL).

4.5. Panel unit root tests

The panel unit root test is a preliminary step toward a regression approach that can be used to determine whether each variable possesses stationarity (Kopeledi, 2020). Due to the length of the data time series, which is 28 years, it is essential to verify stationarity at the level or first difference. The null hypothesis Ho, which states that variables are not stationary, will be rejected, while the alternative hypothesis H1 will be accepted. These test results will be discussed in this study's fifth chapter. The panel unit root test is the most reliable method for obtaining additional observations.

4.5.1. Levin, Lin, and Chu's unit root test

Therefore, applying the Levin and Lin test revealed that the panel unit root test model significantly shows the importance of ADF tests. Levin and Lin's test of 1993 assume the same approach as the ADF test to assess whether the Ho could be a unit root. The ADF tests observe each variable in the panel dataset to account for heteroskedasticity. In the case of normal distribution, the pooled test may be used to assess hypotheses allowing different lags across cross-sections. Therefore, the following test approaches are used to measure the unit root test, including the "Levin and Lin test and Im, Pesaran, and Shin test." In this way, the condition is to show that all the variables are non-stationary to check for panel cointegration (Kapingura, Ikhide, & Tsegaye, 2015; Kelly & Mavrotas, 2008). The LL test equation is presented as follows:

$$\Delta y_{i,t} = a_i + py_{i,t-1} + \sum_{k-1}^{p} \Phi k \quad \Delta y_{i,t-k} + \delta_{it} y + \Theta_t + uit \tag{3}$$

$$\Delta y_{it} = py_{i,t-1} + \sum_{L-1}^{p} \Phi iL \quad \Delta y_{i,t-L} + z_{it} y + u_{it} \tag{4}$$

z_{it} – fixed/ random effect

4.5.2. Im, Pesaran and Shin (IPS) unit root test

According to Kapingura et al. (2015), the Im, Pesaran, and Shin test of 2002 uses the (LL) test to observe the heterogeneity of the Yi,t1 variable's coefficient and proposes a process that depends on the typical individual unit-root test statistics (Kapingura et al.,

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

2015). The LPS test calculates independent estimates for the i section, which permit varying provisions for parameter values, residual variance, and lag durations. Consequently, the Im, Pesaran, and Shin test is an alternative assessment to the Levin and Lin test, where the values can be identical, which can evaluate the various unit root procedures and average the various ADF test data. All (if) cross-sections are observed to be stationary, and the HO for each series Currys unit roots for (i) cross-sections. The equation for IPS is as follows:

$$\Delta y_{i,t} = a_i + py_{i,t-1} + \sum_{k-1}^{p} \Phi k \quad \Delta y_{i,t-k} + \delta_{it} + u_i \tag{5}$$

$$\Delta y_{it} = py_{i,t-1} + \sum_{L-1}^{p} \Phi iL \quad \Delta y_{i,t-L} + z_{it} y + u_i t \tag{6}$$

z_{it} – fixed/ random effect.

The difference between the Levin and Lin test and the Im, Pesaran, and Shin test is that one assumes the common unit root while the other assumes the individual unit root. The Im, Pesaran, and Shin test H1 demonstrates that at least one of the (i) cross-section series is stationary, whereas the Levin and Lin test H1 assumes that all variables or (i) cross-section series are stationary. Therefore, the Levin and Lin test and the Im, Pesaran, and Shin test presume the independence of error terms across cross-sections, thereby ruling out cointegration within them. Observed differences in the elemental values of N and T can produce divergent outcomes for the two experiments.

4.6. Panel cointegration tests

The precondition for running a panel cointegration model is that variables must be non-stationary at level, but when converted to the first difference, they become stationary. It is assumed that this can be attained once all variables are processed through differencing (Cipamba, 2012; Fedeli, Forte, & Ricchi, 2015). Johansen's cointegration approach can be used using the Pedroni test to compare whether variables are cointegrated (Kapingura et al., 2015). For example, in the panel cointegration test, Yit may be stationary for sector 1 but integrated of order one for sector 2; assuming all variables are involved, suppose that in each sector (i), the Y_{it} and X_{it} are cointegrated with parameters β_1. In that case, $Y_{it} - \beta_1 X_{it}$ is I (0) for each (i), but there does not exist common cointegrating parameters β that make $Y_{it} - \beta_1 X_{it}$ stationary for all (i) (unless β_i is identical for all sectors). Similarly, there is no guarantee that the cross-sectional average $\bar{Y} = (I/N)\ \Sigma_i Y_{it}$ and $\bar{X}_{it}$ are cointegrated. Consider the autoregressive model as shown below:

$$Y_{it} = \alpha + \Upsilon_i Y_{i,\,t-1} + \mathcal{E}_{it} \tag{7}$$

$$\text{Therefore, } Y_{it} = \alpha + \jmath_i\, Y_{i,\,t-1} + \mathcal{E}_{it} \tag{8}$$

Where $\jmath_i = Y_{i\,-1}$, The H_0 that all series have a unit root becomes H_0; $\jmath_i = 0$ for all (i), the alternative hypothesis could be that all series that are stationary will have the same mean reversion parameter H_1; $\jmath_i < 0$ for all (i).

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

4.6.1. The KAO Test

The Kao Residual Cointegration Test assumes applying one model to compare whether variables are cointegrated, which is the individual intercept model (no deterministic trend) as only a benchmark. Kao residual cointegration test lag length is automatically selected using the Schwarz information criterion as a benchmark. The probability value is measured compared to critical for all methods at 5% (Cipamba, 2012; Fedeli et al., 2015; Kapingura et al., 2015). The model function is simplified as follows:

$$Y_{it} = \alpha_i + \beta X_{it} + u_{it} \quad (9)$$

Also, a DF residual-based panel cointegration method can be applied to equation 4.8 as :

$$u_{it} = pe_{it} + v_{it} \quad (10)$$

In other words, uit residual estimator. The null hypothesis for no cointegration is presented as H_o: $p = 1$. The Kao test is efficient for observing homogenous cointegrating vectors and AR coefficients. However, on the other hand, it fails multiple exogenous variables and the inability to note cointegration vectors where more than one vector exists (Kapingura et al., 2015).

4.6.2. The PADRON Test

The research uses Johansen's cointegration test, which employs a Pedroni test type. The Pedroni test assumes the application of three models to determine whether or not variables are cointegrated: individual intercept model (no deterministic trend), individual intercept and individual trends deterministic intercept and trend", and no intercept and trends no deterministic intercept or trend (Cipamba, 2012; Fedeli et al., 2015; Kapingura et al., 2015). The Pedroni lag length is chosen mechanically based on the Schwarz information criterion. This study assumes the Pedroni residual cointegration test to investigate the relationship between the six variables. The Pedron test for the analysis of panel cointegration creates heterogeneity. Kapingura et al. (2015) cite Asteriou and Hall's (2007) arguments that a Pedron test differs from McCoskey and Kao in estimating cross-sectional trends and the null hypothesis that there is no long-run relationship between variables. The Pedron tests also permit significant multiple regressors for the cointegration vector. According to Kapingura et al. (2015), cointegration vectors can vary across panel sections and for error heterogeneity across cross-section units. This is how the Pedron test function is presented:

$$Y_{I,t} = \alpha_i + \delta_i + \sum_{m-1}^{M} \beta mi Xmi, t + ui, t \quad (11)$$

According to Kelly and Mavrotas (2008), the Pedron panel cointegration tests can confidently support the assumption that the group ADF-statistic and panel ADF-statistic generally provide significant outcomes.

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

4.7. Autoregressive Distributed Lag Model (ARDL) test

After the Padron and Kao test models have demonstrated panel cointegration within variables, i.e., that variables have a long-run relationship, panel data regression estimators are utilized. The panel data regression models used to estimate whether independent variables affect at least one sector of the economy include the ordinary panel least square, which can detect a significant short-run effect.

Estimating the Autoregressive Distributed Lag Model (ARDL) when the data is a mixture of both orders. The test can be applied regardless of whether the variable combines order zero, order one, or both. Given either of the hypotheses, using the ARDL model provides appropriate estimations. The ARDL model aids in the identification of cointegrating vectors. For instance, if a vector is identified by the ARDL model, "re-parameterize" the cointegration vector into the Error Correction Model (ECM), and its outcomes provide both short-run and long-run correlation results for the variables. According to Pesaran, Shin, and Smith (1996), the ARDL models evaluate the potential cointegration correlation between variables. EViews provides a specialized ARDL estimator that may be suitable for estimating post-estimation diagnostics.

The test assesses long-run relationships within variables. According to Kopeledi (2020) reference to Pesaran et al. (1996) that the "ARDL $(p,q1,q2\ldots\ldots qk)$ model" specification is illustrated below:

$$\phi(L,p)y_t = \sum_{i=1}^{k}[\beta_i(L,q_i)]x_{it} + \delta w_t + u_t \quad (12)$$

where

$$\phi(L,p) = 1 - \phi_1 L - \phi_2 L^2 - \ldots. - \phi_p L^p \quad (13)$$

$$\beta(L,q) = 1 - \beta_1 L - \beta_2 L^2 - \ldots. - \beta_q L^q, \quad (14)$$

for $i=1,2,3 \ldots \ldots k$, $u_t \sim iid(0;\delta^2)$ Based on Pesaran et al. (1996), the "L represents the lag operator such that $L^0 y_t = X_t$, $L^1 y_t = y_{t-1}$, and w_t is an x1 vector of the deterministic variables such as time trends, the intercept term, exogenous variables or seasonal dummies with fixed lags. $P=0,1,2\ldots,m, q=0,1,2\ldots,m, i=1,2\ldots,k$: namely a total of $(m+1)k+1$ different ARDL models". The m represents the maximum lag order, and the sample period is $t=m+1,m+2\ldots,n$.

5. RESULTS AND DISCUSSION

5.1. Descriptive statistics

Before estimating any regression analysis, it was necessary to conduct the descriptive statistics shown in Table 1. It is a method for observing the dataset and assessing what it conveys to determine whether it is beneficial for parametric and non-parametric tests. In addition, it determines whether the sample is normally distributed and checks for the

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

presence of outliers. It measures central tendency using mean, median, and mode values in its standard form. The mean value represents the average of variable values. Table 1 displays that the mean value for each variable is positive. Descriptive statistics also measures dispersion by observing the standard deviation, representing the deviation from the sample mean for each variable.

Table:1. Descriptive statistics

	LGDP	LDI	LEMP	LLC	LEXP01	LIMP	LEXH
Mean	12.13505	10.28277	13.90486	4.685761	10.50300	10.15527	2.043788
Median	12.35818	10.56601	14.11000	4.672829	10.49006	10.08273	2.007138
Maximum	14.09667	11.76283	14.86657	5.036953	12.94576	13.50174	2.797281
Minimum	10.55378	7.531016	12.97206	4.317488	7.073270	6.903747	1.184099
Std. Dev.	1.007864	1.101747	0.539609	0.148744	1.875137	1.959125	0.440841

Source: Eviews calculations.

5.2. Panel unit root tests

Table 2 that follows reports the results of unit root tests for all variables using the first difference series. The reported results for the panel unit root test in Table 2 indicate that all variables are stationary at the first difference, as determined by all tests (LL, IPS, PP, and ADF-test). The test results for all variables are estimated using t-statistics, revealing the significance of all unit root tests at the first difference for the panel. When the estimate indicates significance, we reject the null hypothesis that variables have unit roots and assume that all variables are stationary at the first difference series.

Table 2. Panel unit root test results: first difference

Panel Unit Root Test Results: First Difference - Schwarz information criterion as a benchmark							
	D(LGDP)	D(LDI)	D(LEMP)	D(LLC)	D(LIMP)	D(LXP01)	D (LEXH)
Panel	D(LGDP)	D(LDI)	D(LEMP)	D(LLC)	D(LIMP)	D(LXP01)	D(LEXH)
	t-stats	t-stats	t-stats	t-stats	t-stats	t-stats	t-stats
LL	-2.63703***	-5.05275***	-5.14712***	-6.57527***	-3.50697***	-19.4657***	-7.45673***
IPS	-5.84972***	-5.56272***	-5.06493***	-7.42425***	-5.70015***	-14.8580***	-5.41627***
PP	57.9289***	48.5591***	42.3839***	64.5136***	69.7189***	79.3494***	43.3586***
ADF	56.3267***	51.2154***	43.0931***	66.2882***	51.9489***	77.0370***	45.6575***

Notes:
(1) The t-statistics for each test are reported.
(2) The Null hypothesis: The variable has a unit root.
(3) The null hypothesis of stationarity is tested. *, **, *** indicates the parameters that are significant at 10%, 5%, 1%
probability respectively.
(4) Probability value is compared to critical for all methods at 5%.
Source: Author's (Own) table with data from E views calculations

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

5.3. Panel cointegration tests

The cointegration panel tests are founded on applying the Pedroni and Kao tests. The results of both tests are listed in Table 3 for all Pedroni test-related results and Table 4 for all Kao test results. To assure the accuracy of the results, panel cointegration tests are used to analyze the long-run relationship between the variables observed in the study.

5.3.1. Pedroni Residual Cointegration

Table 3. Pedroni residual cointegration test: at level series

LEVEL	**Panel v-Statistic**		**Panel rho-Statistic**		**Panel PP-Statistic**	
	t-stat/w-stat	P- Value	t-stat/w-stat	P- Value	t-stat/w-stat	P- Value
Deterministic intercept and trend	1.001547	0.1583	0.922631	0.8219	-3.339717	0.0004
w-stat	0.441268	0.3295	0.714399	0.7625	-2.863110	0.0021
	Group rho-Statistic		Group PP-Statistic		Group ADF-Statistic	
Level	t-stat	P-Value	t-stat		P-Value	t-stat	P-Value
Deterministic intercept and trend	1.757739	0.9606	-2.656845		0.0039	-3.204685	0.0007

Notes:
(1) Panel v is a non-parametric variance ratio statistic. Panel p and panel pp are analogous to the non-parametric Phillips-Perron *p* and *t*-statistic, respectively. Panel ADF is a parametric statistic based on the ADF statistic. Group p is analogous to the Phillips-Perron *p* statistic. Group pp and adf are analogous to the Phillips-Perron t-statistic and the ADF statistic, respectively.
(2) The formulae for calculating these statistics can be found in Pedroni (1999).
(3) The null hypothesis of no cointegration is tested. *, **, *** indicates the parameters that are significant at 10%, 5%, 1% probability respectively.
Source: Author's (Own) table with data from E views calculations.

The Pedroni cointegration test result assumes a deterministic intercept and trend model, indicating that six tests of eleven corresponding probability value outcomes are significant at 5% probability. Therefore, we reject the null hypothesis that there is no cointegration among variables and accept the alternative that there is cointegration among variables.

5.3.2. KAO Residual Cointegration Test

Table 4. KAO residual cointegration test: level series

Kao Cointegration: level series		
Appendix 5(C.1)	t-statistic	P-value
ADF	-3.489814	0.0002

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

Notes:
(1) Null hypothesis: No cointegration
(2) The lags used were automatically selected based on the Newey-West bandwidth using the Bartlett kernel
(3) The null hypothesis of no cointegration is tested. *, **, *** indicates the parameters that are significant at 10%, 5%, 1% probability respectively.
Source: Author's (Own) table with data from E views calculations.

Table 4 indicates the result based on the representation of the second applied cointegration procedure, the Kao residual cointegration test. At level series, the Kao test is utilized. The Kao residual cointegration test presupposes using the individual intercept model (no deterministic trend) as a benchmark to compare whether variables are cointegrated. The Kao residual test lag length is chosen mechanically based on the Schwarz information criterion. In this model, the null hypothesis indicates that variables are not cointegrated, whereas the alternative suggests that variables are cointegrated, indicating a long-run relationship between all variables.

5.4. Panel Autoregressive Distributed Lag Model (ARDL) Cointegration Test

Table 5. Panel Data Long-run Regression Model (ARDL) results

Panel Data Least Squares Model	**Panel Autoregressive Distributed Lag Model (ARDL)**			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDI	16.89896	2.101314	8.042091	0.0000
LEMP	0.291367	0.064796	4.496667	0.0001
LIMP	-0.357033	0.517925	6.264944	0.0000
LEXP01	3.244769	0.076205	-4.685158	0.0001
Note: *** significant at 1%; ** significant at 5 % and * significant at 10%				

Source: E views calculations.

The panel ARDL test model is applicable regardless of whether the pertinent variable is integrated of order zero I(0), order I(1), or both. Given either of the hypotheses, applying the ARDL model provides appropriate estimations. The results of the long-term model are presented in Table 5.

The panel ARDL test can effectively interpret results. According to Table 5, domestic investment (DI) in South Africa positively affects economic growth (GDP). This outcome is consistent with both theory and a priori expectations. When domestic investment increases, capacity utilization within the economy expands, resulting in high economic growth (GDP) levels. DI has shown a robust recovery, with increases attributed to preparations for the 2010 FIFA World Cup, following a gradual decline during the global

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

economic crises of 2008/2009, which affected capital investment and sectoral output growth (Adrino, 2012; IDC, 2016; SARB, 2021). The Covid-19 pandemic caused unsustainable domestic investment commitments in 2019 (SARB, 2021). Nonetheless, as depicted in Figure 1, certain industries have greater sectoral domestic investment than others (IDC, 2021b; StatSA, 2021a). Previous studies, such as Manete (2018) and Kolisi (2021), corroborate this result. With a coefficient of 0.29, the empirical findings also indicate that employment (EMP) positively affects economic growth. Thus, a 1% increase in employment will result in 0.29 percent more growth. This result is also consistent with the theory and prior expectations. This finding indicates that employment is a key driver of productivity and profitability. Employment, like investment, stimulates the economy's production output. The result is consistent with and corroborated by the findings of Masipa (2018) and Manete (2018). Certain sectors demonstrate a higher sectoral employment proportion than others. The positive correlation between employment and sectoral GDP was demonstrated when South Africa experienced a decline in employment from late 2018 to 2020 due to the Covid-19 epidemic, which caused business and sectoral unsustainability, increases in unemployment, and continued high inequality (SARB, 2021).

The empirical findings also indicate that a 1% increase in the imports (IMP) coefficient will result in a -0.35% decrease the mean economic growth (GDP) value, all else being equal. This indicates that imports impair South Africa's economic growth. This result is also consistent with the theory and prior expectations. As a result, imports are detrimental to economic development, as domestic resources are exported. This result is also compatible with the theory and previous expectations. In certain instances, imports into South Africa can serve as production inputs. For example, when South Africa's income was high, its import consumption increased. An increase in import consumption may hasten the return of production and investment to economic expansion (SARB, 2021; StatSA, 2021b). Studies such as Mothibi and Ferreira (2019), Masipa (2018), and Feddersen et al. (2017) support the conclusion.

There is a statistically significant relationship between export (EXP01) and economic growth (GDP), as demonstrated by the results. A 1% increase in the EXP01 coefficient will result in a 3.24 percent increase in GDP, all else equal. Studies such as Mothibi and Ferreira (2019) and Ncanywa and Makhenyane (2016) support the result. Exports can represent the value of consumable agricultural, mining, manufactured, construction, and financial services commodities or output of products and services. Even though South Africa (SA) experienced fluctuations that led to a drop in aggregate sectoral export from 2015 to 2020 as a result of the worst drought effects reducing domestic investor confidence in investment, particularly in the agriculture and construction sectors, and as an impact of the Covid-19 pandemic which led to a reduction in export volumes, increase in unemployment and inflation (IMF), a significant positive correlation between export and sectoral output growth was observed. Nevertheless, certain industries demonstrate greater contributions to sectoral export than others.

Vol: 15 **No:** 02 **Year:** 2023 **ISSN:** 1309-8055 (Online) (**pp.** 278-309) **Doi:** 10.34109/ijefs.202315214

Labor cost and real effective exchange rate have a negligible relationship with sectoral GDP, so they are not discussed in Table 5. In the case of labor costs, the negative impact could be due to the lackluster performance of the labor market and the effects of the global economic crisis (SARB, 2021). Consequently, South Africa experienced a dearth of standardized labor costs and benefits across various industries. For instance, the decline in labor costs from late 2018 to 2020 was hampered by the Covid-19 pandemic, which caused business and sectoral instability, unemployment increases an inexpensive migrant labor force, and continued high inequality (SARB, 2021). Real effective exchange rate volatility and uncertainty create a negative correlation due to other forex factors, undisclosed currency trading, black market, possible money laundering, inflated value for game animal sales, financial and economic crises, and the Covi-19 pandemic, which harmed global trade and caused inflation in brand value to US$ from R15/$ to R16.4/$ from 2019 to 2020 (SARB, 2021). For instance, the SARB permitted increased FOREX purchases over time to partially counteract the rand's rising pressure (SARB, 2017, 2021).

Table 6. Pairwise Dumitrescu Hurlin Panel Causality Tests

Null Hypothesis:	W-Stat.	Zbar-Stat	Prob.	Decision
LDI does not homogeneously cause LGDP	2.19712	-0.01220	0.9903	Accept
LGDP does not homogeneously cause LDI	1.93233	-0.25319	0.8001	Accept

Source: Author's (Own) table with data from E views calculations.

The results of the Dumitrescu Hurlin panel causality test to ascertain whether the LDI granger causes LGDP are presented in Table 6. According to Table 6, gross domestic product (GDP) does not uniformly influence domestic investment (LDI). The same holds for LDI, which does not uniformly cause LGDP. The findings imply that domestic investment does not affect economic development in South Africa. This could be attributed to foreign investment's significant influence on the domestic economy (Masipa, 2018).

6. CONCLUSION

The study examined the impact of domestic investment on South Africa's sectoral economic development in light of the various estimates of domestic investment's effect on total GDP and sectoral output growth. The panel ARDL estimator proposed by Pedroni (2001) was utilized. As explained in this chapter, this panel ARDL long-run estimator concludes that domestic investment impacts at least one sectoral output growth in South Africa in the long run. For example, the results of the ARDL test indicate that domestic investment, employment, imports, and exports have a significant long-term influence on GDP in at least one of the sectors. According to the Granger causality, domestic investments do not uniformly cause gross domestic product. Sectoral development in South Africa relies heavily on foreign direct investment rather than domestic investment. The estimated results indicate the importance of attracting

domestic investment, consistent with the Keynesian theory that domestic investment is anticipated to stimulate economic growth. Domestic investment on a minimum scale influences South Africa's sector output growth.

The study's policy implications are influenced by the finding that domestic investment positively affects sectoral economic growth. Instead of relying on government spending for development, economic policies suggested for South Africa's economic growth should focus on attracting domestic investment to boost sectors. The results will enable policymakers and state cooperation to develop progressive economic policies and achieve the Sustainable Development Goals (SDG) and National Development Plan (NDP) objectives. Thus, this will drive monetary policy towards economic growth reforms that will encourage modernized industries, reduce barriers to entry, restrict currency trading, eliminate the possibility of money laundering, avoidance of cheap migrant labor, the creation of a labor-intensive environment within sectors, and a focus on industrial and trade policy that can boost export competitiveness.

The results also revealed no evidence of Granger causality between domestic investment and economic growth in South Africa at the regional level. This was partially attributed to the role that foreign investment plays. Given that foreign investment bridges the disparity between domestic capital demand and supply, it is necessary to attract it. The study is predominantly quantitative, but several qualitative factors may have influenced the association between the variables. However, these were documented in narrative form in the relevant sections of the study. The second issue with the study is that it used annual data, whereas quarterly data would have provided more observations.

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