INTERNATIONAL JOURNAL OF ECONOMICS AND FINANCE STUDIES
Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs. 20212007
Received: 21.10.2020 | **Accepted:** 12.03.2020 | **Published Online:** 01.04.2021

-RESEARCH ARTICLE-

THE RELATIONSHIP BETWEEN GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN SOUTH AFRICA FROM 1981-2019: AN ARDL AND ECM APPROACH

Nyiko Worship Hlongwane[1]

School of Economic Sciences, North-West University, South Africa
Email: Nyikowh@gmail.com
http://orcid.org/0000-0002-7698-9578

Tumelo Donald Mmutle[2]

School of Economic Sciences, North-West University, South Africa
Email: Mmutletd@yahoo.com,

Olebogeng David Daw[3]
School of Economic Sciences, North-West University, South Africa
Email: David.Daw@nwu.ac.za
http://orcid.org/0000-0003-4853-5170

─Abstract─

This study examines the relationship between government expenditure and economic growth in South Africa for the period spanning from 1981 to 2019. The study utilises the available annual time series data sourced from the South African Reserve Bank (SARB), the World Bank and Knoema from 1981 to 2019. Statistical results from the ARDL model show that there is a negative and insignificant long run relationship between government expenditure and economic growth in South Africa. Results from the ECM show that there is a short run positive and statistically significant relationship between government expenditure and economic growth. Government expenditure can therefore be used as a short run stabilisation tool since the relationship is positive and statistically significant. In the long run however, the government should promote investment as it boosts economic growth and helps the avoid crowding out effect of investment in South Africa

Keywords: Economic growth, government expenditure, ARDL model, ECM, South Africa.

Citation (APA): Hlongwane, N. W., Mmutle, T. D., Daw, O. D. (2021). The Relationship Between Government Expenditure and Economic Growth in South Africa from 1981-2019: An Ardl And Ecm Approach. *International Journal of Economics and Finance Studies, 13* (2), 131-159. doi:10.34111/ijefs.20212007

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

JEL Specifications: C1, E12, F41, H50

1. INTRODUCTION

The rise in a country's actual gross domestic product from one year to the next is referred to as economic growth. Udoy (2021) narrates that, "Covid pandemic of 2019-2020, dubbed Covid19, has shook the world, with the first cases being discovered in Wuhan, China in December 2019." It is undeniable that the pandemic wreaked havoc on global economies, particularly in emerging countries such as South Africa. This requires government intervention to stabilise the flow of economic activities and this exercise concentrates on the impact of government spending on South African economic growth. Many economies responded by implementing monetary policy, fiscal policy, and quantitative easing with the aim to stimulate economic activities. Öztürk et al. (2020) states that, "the initial reaction of governments trying to alleviate the economic repercussions of Covid-19 was to introduce and alleviate certain fiscal instruments." This emphasizes the need of determining the impact of government spending on South African economic growth. The significance of this study is to show the impact of an increase in government on economic growth since government expenditure has been increasing in health sector, education, social protection, economic affairs, and public services but this did not lead to the multiplier effect of economic growth as this has been declining. The study explores the relationship between government expenditure from 1981 to 2019 due to the lack of data on government expenditure in South Africa in 2020.

Study overview: It is important to assess the impact of government spending on economic growth on South Africa and other emerging economies so that the governments of those countries know how to stimulate and control economic activities during different periods. The South African government uses government spending as a fiscal policy. whether expansionary or contractionary, to help combat the issues of unemployment, poverty, inflation, lack of equality, and low literacy rate.

Researchers like Colombier (2011), Olabisi et al. (2012), Nworji et al. (2012), Gadinabokao et al. (2013), M. Oladele et al. (2017), Valoyi (2019), Chu et al. (2020) discovered a positive relationship between the two variables understudy while researchers like Chipaumire et al. (2014) and Molefe et al. (2017) discovered a long run inverse relationship between the variables. The South African government expenditure covers spending on public order, economic affairs, education, public services and other.

According to StatsSA (2020), the South African general government spent R1.79 trillion with its real GDP of R3 149 337 and GDP at market prices of R5 077 625. StatsSA (2020) also expand on how the expenditure by the government was 24% on public services, 20% on education, 14% on social protection, 12% on health, 10% on economic affairs, 10% on public order and 10% on other services such as defence, housing, recreational and culture and environmental protection. Idris et al. (2017) highlights that

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

it's paramount to reassess expansionary fiscal policy to reduce potential inflation, a widening deficit, and increasing debt.

There is an anticipated fear and reality that when an economy is approaching full employment level, if government expenditure keeps on increasing in the long run it leads to inflationary pressure as prices keep on increasing while the level of output has reached full employment level. In general economics, government spending leads to an increase in gross domestic product since it forms part of the economic sectors that are taken into national accounts. Therefore, government spending should be monitored to monitor the key macroeconomic indicators in South Africa. One of the most significant tools to combat macroeconomic challenges is a country's fiscal policy.

According to Froyen (2013), the Keynesian school believes that increasing government expenditure results in a higher national income. An expansionary fiscal policy, according to Keynesian theory, leads to economic growth as a result of the increase in government spending. As government spending rises, so does production, this causes a rise in aggregate demand, which leads to an increase in gross domestic product. Since not all government expenditure reflects a market for currently manufactured goods and services, not all government expenditures are included in GDP (Froyen, 2013). It is important to note that there are certain expenditures by the government that do not lead to an increase in income; for example, payment to individuals and government interest payments and other similar spending should be limited to avoid a negative effect of the correlation between government spending and economic growth. If such spending does not increase output, the final outcome will be that economic growth will be negatively impacted as it relies on an increase in output from one-time period to the other.

The South African gross domestic product per capita was 2.9%, -3.1%, 0.8%, 2.1%, -0.6%, -1.2% and -8.3% annual in 1981, 1991, 2001, 2011, 2018, 2019 and 2020 respectively while government expenditure 15.6%, 17%, 10.9%, 8.4%, 7.5% and 11.5% in 1981, 1991, 2001, 2011, 2018, 2019 and 2020 respectively. Evidently, there is a problem of low economic growth and higher government spending in South Africa. The main causes of low economic growth are high unemployment rate, poverty, corruption, and inequality. Hence, this study analyses the impact of government expenditure on economic growth in South Africa from 1981 to 2019 using investment, exports, and unemployment as intermittent variables.

2. LITERATURE

Theoretical literature review: This section focuses on the various economic theories that are currently part of the literature on the subject. Reference to theoretical literature is essential in this study since it provides a number of historical contexts regarding advancements. Multiple studies have sparked debate on how developing countries may merge with developed economies. The theoretical frameworks employed in this study

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

are Wagner's Rule of government expenditure and the Keynesian view of government spending.

Wagner's Rule: According to Wagner (1958), the fiscal economy refers to the economic activities that the government must engage in to collect and employ the resources required to provide services. Wagner (1958) devised three key points concerning the increase in governmental spending. To begin with, public sector activity will take the place of private sector activity during the industrialization process. Administrative and protective duties of the state will be expanded.

Secondly, government must offer cultural and welfare services such as education, public health, old-age pensions or insurance for retirement, food subsidies, natural disaster relief, environmental protection programs, and other social duties. Lastly, greater industrialisation will bring about technical progress and emergence of huge monopolistic corporations. Governments will have to mitigate these impacts by using budgetary resources to provide social and merit goods. Public expenditure, according to Adolf Wagner, is an endogenous element that is influenced by national revenue growth. As a result, it can be stated that it is national income that drives public spending. Wagner's rule is a long run phenomenon, the longer the time series, the better the economic interpretations and statistical conclusions obtained.

Keynesian theory: Keynes (1936) rejected the idea that the economy will return to the natural state of equilibrium. Instead, he argued that once an economic downturn has set in for whatever reason, the fear and gloom that it engenders among business and investors will tend to become self-fulfilling and can lead to a sustained period of depressed economic activity and unemployment. In response to this, Keynes advocated a counter-cyclical fiscal policy in which, during periods of economic crisis, the government should undertake deficit spending to make up for the decline in investment and boost consumer spending to stabilize aggregate demand.

Based on his theory, Keynes advocated for increased government expenditures and lower taxes to stimulate demand and pull the global economy out of the depression. Consequently, increasing public expenditure will lead to more jobs, profitability, and investment through an increase in aggregate demand. Keynesian theorists argue that economies do not stabilize themselves very quickly and require active intervention that boosts short term demand in the economy. Wages and employment are slower to respond to needs of the market and require government intervention to stay on track. This increases aggregate demand which causes a rise in production according to the spending multipliers.

Empirical literature review: The argument on the relationship between government spending and economic growth is still of interest today among policy makers, politicians, and academics into whether government spending supports or inhibits economic growth. Consequently, many scholars have conducted a wide variety of empirical investigations

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

and several outcomes. Some researchers found that government spending promotes economic growth through promotion of infrastructure, economic activities, and education while others argue that government expenditure is detrimental for economic growth as provision of services are understood to not lead to growth but development.

2.1 Government Spending and Economic Growth

Studies that found a negative relationship: Iniguez-Montiel (2010) investigated government expenditure and economic growth in Mexico for the period spanning from 1950 to 1990 employing the Engle-Granger approach and finding an inverse relationship between government expenditure and economic growth. Wu et al. (2010) investigated a panel relationship between government expenditure and economic growth, discovering an inverse relationship among 184 countries. Studies by Kumar et al. (2012), Chipaumire et al. (2014) and Abu-Eideh (2015) validates Wagner's rule of government expenditure. Molefe et al. (2017) conducted a study on government expenditure and economic growth in South Africa and the researchers found that government expenditure is detrimental to economic growth. Through causality checks, the researchers found that government expenditure is as a result of economic growth, validating the key issue highlighted by Wagner (1958). Gukat et al. (2017) who examined the impact of government expenditure on economic growth in Nigeria for the period 1981 to 2016. For proxies of government expenditure in terms of recurrent and capital expenditures, OLS analysis concluded that government expenditure does not have significant relationship into economic growth and recommended that government should invest more on capital expenditures due to its multiplier effects on long-run economic growth. By employing a Vector Error Correction Model, Masipa (2018) found that government expenditure was detrimental to economic growth in South Africa for the period from 1980 to 2014. Zungu et al. (2020) investigated nonlinear effects of government spending on economic growth in 10 Southern African Development Community (SADC) countries from 1994 to 2017 employing panel smooth transition regression (PSTR) model and found that government expenditure causes a decline in economic growth in the SADC region. The researchers recommend that policymakers ought to formulate prudent fiscal policies that encourage government expenditure, which would improve growth for those countries that are below the estimated threshold point. Olaoye et al. (2021) show an inverse relationship between government spending and economic growth in ECOWAS over the period 2008– to 2017. By following the panel vector autoregressive (PVAR) and generalized method of moment (GMM) approach, it is shown that there is a negative association and that there does not exist any unidirectional or bidirectional causal relationship between government spending and economic growth in ECOWAS.

Studies that found a positive relationship: Colombier (2011) investigated government spending and economic growth in Swiss by employing an ARDL model and the author discovered that government expenditure boosts economic growth. Gadinabokao et al. (2013) investigated government expenditure and economic growth in South Africa for

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

the period spanning from 1980 to 2011 and the authors found that government expenditure boosts economic growth. The researchers further revealed that gross capital formation granger causes economic growth in South Africa. Ghose et al. (2013) use a panel approach to investigate into government expenditure and economic growth in 19 emerging economies and found that government expenditure encouraged economic growth. Q. Liu et al. (2015) investigated the relationship between government expenditure and economic growth in China and discovered that through government spending on technology and education, it is possible to boost economic growth. Agostino et al. (2016) explore the effect of government spending on economic growth in case of 106 by employing the data period from 1996 to 2010. GMM econometric results show the positive significant results of the relationship between government spending and economic growth. Another study conducted in case of South Africa used quarterly data from the period 1970 to 2016 (Iwegbunam, 2017). VECM results shows that government spending boosted the economic growth in South Africa, recommending that the government should increases its expenditure in capital and labour intensive sectors for enhancing economic growth. Mazni (2017) investigated government expenditure and economic growth in ASEAN-5 countries by employing a dynamic panel approach and discovered that government expenditure boosts economic growth through productivity and a well-managed government budget. Facchini et al. (2018) investigated government expenditure and economic growth in France by employing an ARDL model and discovered that government expenditure makes significant economic growth.

A positive effect of the public expenditure on health on economic growth in the G7 countries was found by DİNÇER et al. (2019) where the researchers also suggest that public expenditure plays a positive role on the growth of emerging economies. This means that economic growth because of public expenditure is not only found in developed nations, but in developing countries as well. On a primary sector level, Magdalena et al. (2020) found out that government expenditure plays a positive role on the growth of economy in central Kalimantan for the period from 1990 to 2019. By analysing the literature on government expenditure and economic growth in developing countries, Kouassi (2018) highlights the controversial output by several researchers where some tend to validate the Keynesian theory that public expenditure plays a positive role on economic growth while others validate the Wagner hypothesis that government expenditure is as a result or outcome of economic growth. However, more focus must be placed when validating these theories as Wagner highlights that his hypothesis can be observed for a period of 100 years. A positive insignificant contribution of government expenditure on health on economic growth is found by Yang (2020), employing a panel evaluation on 21 developing countries for the period from 2000 to 2016. The researcher further suggests that health expenditure should be conducive not only to the improvement of the human capital level and the welfare of the people, but also for the promotion of economic growth. On a panel analysis of 17 advanced economies for the period from 1870 to 2013, Sharma (2018) found that public

expenditure on health plays a positive role economic growth and recommend the increase of public expenditure on health to boost economic growth of these advanced economies.

Government expenditure on education and health infrastructure was found to have a positive significant contribution on economic growth in Nigeria for the period from 1980 to 2016 by Babatunde (2018), while spending on agriculture and natural resources revealed a negative impact on economic growth for the same period. Using a nonlinear smooth transition regression for the period from 1988 to 2015, Phiri (2019) suggest that government expenditure on military should be shifted to non-military components of the economy so it can boost economic growth in South Africa. By employing an ARDL model on 10 selected Central and Eastern European countries for the period from 1995 to 2015, Lupu et al. (2018) found out that government expenditure on education and healthcare have a positive impact on the economy, while expenditures on defence, economic affairs, general public services, and social welfare have a negative impact. The researchers suggest that the governments of Central and Eastern European countries must be careful about the targets of their public spending and about how the funding is used, because this can have positive impacts on economic growth, given that composition matters most. Zakaria et al. (2019) found out that an increase in government spending will lead to an increase in economic growth in Pakistan, recommending that through government expenditures, more resources should be allocated to improve levels of law and order in the country because doing so is beneficial for economic growth. Using panel data from 37 high-income and 22 low- to middle-income countries covering 1993 to 2012, Chu et al. (2020) based on OLS fixed effects and GMM techniques challenge much of the existing empirical literature in relation to developing economies by showing that a shift in government expenditure away from non-productive government expenditure and towards productive forms of expenditure is associated with higher levels of growth in both high-income and low- to middle-income economies. Using panel data set covering 59 countries in 1990 to 2019, Ahuja et al. (2020) found the unidirectional causality between economic growth and government expenditure where the causation runs between public spending and GDP growth. The results at large support the Keynesian framework that asserts the importance of government expenditure in stimulating economic growth. By employing dynamic OLS estimation during 1980-2017 found similar findings in Ghana (Nyarko-Asomani et al., 2019).

Anwar et al. (2020) analyse regional government expenditure on regional economic growth using panel data from 33 provinces of Indonesia for the period 2007-2018. Spatial Durbin Model (SDM) shows that regional government expenditures have a significant and positive effect on regional economic growth of 33 selected Indonesian province. Further, it shows that the abundant effects of economic growth, government spending, investment, and education contribute positively to the economic growth of neighbouring regions. Nartea et al. (2020) evaluate the composition of government spending on economic growth in case of Netherlands. Panel data rom 12 provinces of

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

Netherland is used in this study and the data spans from 2004-2014. The FMOLS estimation shows that there is a positive relationship between government spending and economic growth in case of selected states of Netherlands. Divino et al. (2020) explored the relationship among the optimal composition of governmental spending and size of the government and the economic growth in the case of the 27 states of Brazil. Data analysis from nonlinear least squares method evaluated the exclusive influences of government spending and policies on the overall economic development and productivity of the country. In the same year, another panel study focusing on MENA Countries (Hicham, 2020) investigates casual relation between government spending and economic growth over the period of 1987–2017. This study supports the neutrality hypotheses in the short-run and Wagner's law, Keynes view, neutrality and bidirectional hypotheses in the long term.

By employing an ARDL model for the period from 1970 to 2019, Aluthge et al. (2021) found a positive contribution of government expenditure on economic growth in Nigeria and recommends that the government should increase the share of the capital expenditure especially on meaningful projects that have a direct bearing on citizens' welfare and that the government should also improve the spending patterns of recurrent expenditure through careful reallocation of resources toward productive activities that would enhance human development in the country. By employing an ARDL model for the period from 2004 to 2019, Barlas (2020) found that government expenditures on education and infrastructure are positively correlated with economic growth in Afghanistan while security expenditure is negatively linked with growth rate. The researcher suggests that to increase the economic growth rate, the government should adopt precise and accurate control on its spending on defence, as to reduce corruption and mismanagement. By employing an ARDL model in Sri-Lanka, Selvanathan et al. (2021) found that capital and recurrent expenditures have a positive effect on economic growth in the short-run as well as long-run. At the disaggregated level, expenditure on agriculture and health positively impact economic growth in the long run, while welfare expenditure has a negative effect. These findings provide important insights for policymakers to consider when allocating sectoral level expenditure budget. Arvin et al. (2021) investigated a panel vector error correction approach of government spending on economic growth in low-income and middle-income countries and found that government expenditure causes economic growth. Samuel et al. (2021) examined the effect of various components of Government Expenditures on Economic Growth in Nigeria for periods between 1981 and 2020. The researcher used a few proxies to measure government spending and data shows mixed results. By employing Error Correction model, it is shown that recurrent expenditures on agriculture, health and education have an insignificant negative impact on economic growth and capital expenditures; government capital expenditures on social services were shown to have a negative and significant impact on economic growth, while on the other hand recurrent expenditure on debt servicing and road and construction indicated a positive and

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

negligible impact on economic growth in the short run. In the long run, all the components of government expenditures employed showed a significant effect except government capital expenditures which indicate towards a positive and insignificant impact on economic growth in Nigeria. There is a need for the Nigerian government to increase its allocations to primacy sectors.

Studies that found causal relationship: Dudzevičiūtė et al. (2018) found a significant causal effect of government expenditure on economic growth in the European Union countries by utilising the Granger causality test for the period from 1995 to 2015. The researchers recommends that the government must manage the resources properly so it can boost economic growth in European countries. Gurdal et al. (2021) found long run bidirectional causality between government expenditure and economic growth in the G7 countries by utilising time series data spanning for the period from 1980 to 2016, recommending that public spending should be encouraged in the G7 nations to keep its positive contribution on the growth of these economies. Anisaurrohmah et al. (2020) found that government expenditure variable partially does not have a significant effect on economic growth in South Kalimantan for the period from 2013 to 2018 and therefore recommend that increase in investment and labour experience will affect the increase in economic growth. Using panel data from 14 major sub-national governments in India during the period 1980-81 to 2013-14 using Dynamic Ordinary Least Square (DOLS) and Fully-Modified Ordinary Least Square (FMOLS) methods, Mishra et al. (2021) found a positive and statistically significant impact of government spending on economic growth. Dumitrescu-Hurlin pairwise causality test reveals existence of bi-directional causality between government expenditure and economic growth. The analysis reveals that at sub-national level in India, expansionary fiscal policy through building infrastructure and investing in productive sector, and escalation in credit facility with a lower rate of interest to the private sector will be helpful for the economy in generating higher economic growth.

2.2 Capital Formation and Economic Growth

Onyinye et al. (2017) studying the case of Nigeria during 1984-2015, find that a positive insignificant relation exists between capital formation and economic growth both in short and long term. Meyer et al. (2019) investigate the causality between gross fixed capital formation, employment and economic growth in South Africa use quarterly data from 1995Q1 to 2016Q4. By analysis through Johansen cointegration and Vector Error Correction Models (VECM) results shows that domestic investment and employment positive association with economic growth and investment is found to be a positive driver of employment in the South African economy in the long run. Topcu et al. (2020) examine the effects of natural resources, energy consumption and capital accumulation on economic growth for 122 countries from different income levels using 1980-2018 data. Panel VAR and Granger causality test results shows positive and significance relationship between gross fixed capital and economic growth in high income countries

but shows opposite results in low income countries. Granger causality test results shows there is a unidirectional causality between gross capital formation and GDP in all income levels countries. By employing SEM techniques using quarterly data of 1990 to 2018, it is shown that the influence of gross capital formation on economic growth was insignificant in Pakistan (Yasmeen et al., 2021). In the same year, another study investigates the effect of capital formation and globalization on economic growth in case of developing countries from European, Asian, African, and American continents (Aslan et al., 2021). Panel Vector Autoregression (PVAR) approach is used to test the relationship for the period from 1980 to 2018. PVAR shows a negative relationship in case of European, Asian, and American countries and vice versa in African countries. Causality results show that there is bidirectional causality identified between capital formation and growth in Europe and Asia, unidirectional causality from capital formation to GDP in Africa and America (Aslan et al., 2021).

2.3 Exports and Economic Growth

Munir et al. (2018) analyze the impact of export composition on economic growth of South Asian countries, using panel data of four countries of South Asia, i.e. Bangladesh, India, Pakistan and Sri Lanka is utilized data from 1990 to 201. Fixed effect results shows that inverted U shape relation exists between export and economic growth in selected countries. Autoregressive Distributed Lag (ARDL) bounds testing technique explore findings of the relationship in case of Sri Lanka (Sultanuzzaman et al., 2018). By utilized data from 1980-2016, results indicate that there exist negative and significant relation in the long run but in short run there is a positive relationship, it is due to Sri Lankan exports strongly depend on primary goods so there is a risk of finite resources and price volatility. Dinç et al. (2019) investigate the export led economic growth for Brazil. Results shows that exports boost economic growth in case of Brazil both in the short and long run. Another study investigates this relationship in case of Russia (Uysal et al., 2019). Granger causality test shows that unidirectional causality existed between economic growth and export in the Russian economy between 2003 and 2018. M.-H. Liu et al. (2019) examines the role of exports in China's economic growth, by following the ARDL model and quarterly time series data from 1994 and 2018, results demonstrated the importance of exports in China's GDP growth after the Global Financial Crisis. Edo et al. (2020) analyse the effect of external debt and export on economic growth in Sub-Saharan African countries. By using ARDL, panel model technique shows an insignificant positive impact of both external debt and export on economic growth in the short run and shows opposite results in the long run.

2.4 Unemployment and Economic Growth

Soylu et al. (2018) investigate the relationship between economic growth and unemployment in Eastern European Countries for the period of 1992-2014 within panel data framework in the context of Okun's Law. Pooled OLS and Panel Johansen Co-integration tests results show that unemployment is affected positively by economic

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

growth because of Okun's coefficient for Eastern European Countries and there is a co-integration between these key macroeconomic variables. Lamdjed et al. (2020) test the asymmetric effect between the change in unemployment rates and the real economic growth according to the Okun's law in case of Algerian economy during the period 1980-2018. Nonlinear Autoregressive Distributed Lag (NARDL) results reflect the absence of Okun's law in the long term. The asymmetry test also shows symmetry in the long run relationship and asymmetry in the short run relationship. Samarah (2021) estimate the relation between economic growth and unemployment in case of Palestine to examine the COVID 19 effect, and for this purpose, data was collected during 1995-2018, and the results show that unemployment and economic growth have a negative relationship with each other. Padder et al. (2021) conclude with similar findings in case of India by employing OLS approach for the data of 1990-2020. The results of the estimated regression only 6 percent of the impact of economic growth on unemployment. In the same year, another study in case of Indonesia. Sintha et al. (2021) analyzes the determinants of the unemployment rate in Indonesia, utilizing the panel data of 34 provinces of Indonesia and data analysis from Fixed effect model, and finding that economic growth simultaneously have a significant and positive effect on the open unemployment rate. Another study in MALUKU province of Indonesia (Leasiwal, 2021), utilized longitudinal data from 2007-2019 and the OLS results show the economic growth which is proxied by GRDP has a negative relationship with the unemployment rate and other control variable (wages and inflation) positively affecrt unemployment in Maluku province of Indonesia. The conclusions show that increased economic growth is more likely to provide new job opportunities and that labor intensive economic growth reduces the number of unemployed.

3. DATA AND METHODOLOGY

3.1 Data

The study uses the time series data from World Bank since 1981 to 2019 to find the relationship between GDP per capita, government expenditures, capital formation, exports and unemployment rate. Variable-specific details are shown in Table 1.

Empirical model specification: The adopted model employed in this study was used by Colombier (2011), Altunc et al. (2013), Puatwoe et al. (2017), Facchini et al. (2018), Lupu et al. (2018) and Barlas (2020). The econometric model can be specified as follows:

$$LGDP_t = \beta_0 + \beta_1 LGVE_t + \beta_2 LINV_t + \beta_3 LEXPO_t + \beta_4 LUNE_t + \varepsilon_t \quad \ldots\ldots(1)$$

Whereby,

LGDP = Logged gross domestic product per capita

LGVE	=	Logged government expenditure
LINV	=	Logged gross fixed capital formation (investments)
LEXPO	=	Logged merchandise exports as a percentage of GDP
LUNE	=	Logged unemployment rate
ε_t	=	the error term

3.2 Model Specification

The base model showing GDP per capita, government expenditures, capital formation, exports and unemployment can be specified as:

GDPt = f (GVEt, INVt, UEXPOt, UNEt) …….(2)

The econometric model extended from the Cobb-Douglas model can be specified as given below Eq. (1):

$LGDPt = \beta 0 + \beta 1 LGVEt + \beta 2 LINVt + \beta 1 LEXPOt + \beta 2 LUNEt\ \varepsilon t$ ……(3)

Where, $\beta 0$, $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$ shows coefficient, t represents time series data, and εt is an error term.

3.3 Unit Root Test

Tests of unit root are estimated at the first step before estimating Autoregressive Distributive Lag Model. It determines whether the series have a stationary property or not. The stationarity of variables helps solve the problem of spurious regression equations Augmented Dickey- Fuller test proposed by Dickey et al. (1981), aids in determining the order of integration of data series. This test is used to determine the variables in the study's long-term properties. If a time series is determined to be stationary, it means that its variance, mean, and covariance remain constant over time, and that the result of their analysis are reliable and can be used to forecast future economic activities. And Phillips- Perron tests are also conducted for confirming the series are non- stationary for further test of cointegration.

3.4 ARDL Model

The study adopts the Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001). A number previous studies analysis have been conducted through this econometric approach (Aluthge et al., 2021; Barlas, 2020; Colombier, 2011; Facchini et al., 2018; Lupu et al., 2018; Selvanathan et al., 2021). ARDL model that can be specified as given Eq. (3), Eq. (4), Eq. (5), Eq. (6) and Eq. (7) for long run estimations between the variables:

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 1-24) **Doi:** 10.34109/ijefs.202112222

Table 1. Variable Description

Symbol	Variables	Variables explanations	Units	Source	Used
LGDP	Gross domestic product per capita	It measures a country's economic output per person and is calculated by dividing the GDP of a country by its population.	constant LCU	WDI	Tacchella et al. (2018) Shabani et al. (2019) Lyeonov et al. (2019)
LGVE	Government expenditure	It represents final consumption expenditure by general government which includes spending on individual goods and services.	% of GDP	WDI	Facchini et al. (2018) Zungu et al. (2020) Gurdal et al. (2021)
LINV	Gross fixed capital formation	It is the total spending by both the private and public sectors on tangible and intangible assets.	% of GDP	WDI	Onyinye et al. (2017) Meyer et al. (2019) Topcu et al. (2020) Yasmeen et al. (2021)
LEXPO	Merchandise exports	Exports are goods and services that are produced in one country and sold to buyers in another	% of GDP	WDI	Munir et al. (2018) Dinç et al. (2019) Edo et al. (2020)
LUNE	Unemployment rate	Jobless person	% of total labor force	WDI	Soylu et al. (2018) Lamdjed et al. (2020) Samarah (2021)

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 1-24) **Doi:** 10.34109/ijefs.202112222

$$LGDP_t = \beta_{01} + \sum_{i=1}^{p} k_{11}\, LGDP_{t-i} + \sum_{i=1}^{q} k_{21}\, LGVE_{t-i} + \sum_{i=1}^{q} k_{31}\, LINV_{t-i} + \sum_{i=1}^{q} k_{41}\, LEXPO_{t-i} + \sum_{i=1}^{q} k_{51}\, LUNE_{t-i} + \varepsilon_t \quad \text{.....(4)}$$

$$LGVE_t = \beta_{02} + \sum_{i=1}^{p} k_{12}\, LGVE_{t-i} + \sum_{i=1}^{q} k_{22}\, LGDP_{t-i} + \sum_{i=1}^{q} k_{32}\, LINV_{t-i} + \sum_{i=1}^{q} k_{42}\, LEXPO_{t-i} + \sum_{i=1}^{q} k_{52}\, LUNE_{t-i} + \varepsilon_t \quad \text{.....(5)}$$

$$LINV_t = \beta_{03} + \sum_{i=1}^{p} k_{13}\, LINV_{t-i} + \sum_{i=1}^{q} k_{23}\, LGVE_{t-i} + \sum_{i=1}^{q} k_{33}\, LGDP_{t-i} + \sum_{i=1}^{q} k_{43}\, LEXPO_{t-i} + \sum_{i=1}^{q} k_{53}\, LUNE_{t-i} + \varepsilon_t \quad \text{.....(6)}$$

$$LEXPO_t = \beta_{04} + \sum_{i=1}^{p} k_{14}\, LEXPO_{t-i} + \sum_{i=1}^{q} k_{24}\, LINV_{t-i} + \sum_{i=1}^{q} k_{34}\, LGVE_{t-i} + \sum_{i=1}^{q} k_{44}\, LINV_{t-i} + \sum_{i=1}^{q} k_{54}\, LUNE_{t-i} + \varepsilon_t \quad \text{.....(7)}$$

$$LUNE_t = \beta_{05} + \sum_{i=1}^{p} k_{15}\, LUNE_{t-i} + \sum_{i=1}^{q} k_{25}\, LEXPO_{t-i} + \sum_{i=1}^{q} k_{35}\, LINV_{t-i} + \sum_{i=1}^{q} k_{45}\, LGVE_{t-i} + \sum_{i=1}^{q} k_{55}\, LGDP_{t-i} + \varepsilon_t \quad \text{.....(8)}$$

3.5 Error Correction Model

After confirmation of a long run relationship existing between economic growth, government expenditures, capital formation, exports and unemployment, researcher finds the short run relationship between them with the help of ECM approach. Short run dynamic error correction model can be derived from an ARDL model through a simple linear transformation. Below Eq. (8, 9, 10, 11, and 12) shows the short run relationship, ECT_{t-1} is an error correction term that should be negative and statistically significant. λ is the coefficient that shows speed of adjustment to long run equilibrium and Δ represents a differenced variable.

$$\Delta LGDP_t = \beta_{01} + \sum_{i=1}^{p} \alpha_{11}\, \Delta LGDP_{t-i} + \sum_{i=1}^{q} \alpha_{21}\, \Delta LGVE_{t-i} + \sum_{i=1}^{q} \alpha_{31}\, \Delta LINV_{t-i} + \sum_{i=1}^{q} \alpha_{41}\, \Delta LEXPO_{t-i} + \sum_{i=1}^{q} \alpha_{51}\, \Delta LUNE_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad \text{.....(9)}$$

$$\Delta LGVE_t = \beta_{02} + \sum_{i=1}^{p} \alpha_{12}\, \Delta LGVE_{t-i} + \sum_{i=1}^{q} \alpha_{22}\, \Delta LGDP_{t-i} + \sum_{i=1}^{q} \alpha_{32}\, \Delta LINV_{t-i} + \sum_{i=1}^{q} \alpha_{42}\, \Delta LEXPO_{t-i} + \sum_{i=1}^{q} \alpha_{52}\, \Delta LUNE_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad \text{.....(10)}$$

$$\Delta LINV_t = \beta_{03} + \sum_{i=1}^{p} \alpha_{13}\, \Delta LINV_{t-i} + \sum_{i=1}^{q} \alpha_{23}\, \Delta LGVE_{t-i} + \sum_{i=1}^{q} \alpha_{33}\, L\Delta GDP_{t-i} + \sum_{i=1}^{q} \alpha_{43}\, \Delta LEXPO_{t-i} + \sum_{i=1}^{q} \alpha_{53}\, \Delta LUNE_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad \text{.....(11)}$$

$$\Delta LEXPO_t = \beta_{04} + \sum_{i=1}^{p} \alpha_{14}\, \Delta LEXPO_{t-i} + \sum_{i=1}^{q} \alpha_{24}\, \Delta LINV_{t-i} + \sum_{i=1}^{q} \alpha_{34}\, \Delta LGVE_{t-i} + \sum_{i=1}^{q} \alpha_{44}\, \Delta LINV_{t-i} + \sum_{i=1}^{q} \alpha_{54}\, \Delta LUNE_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad \text{.....(12)}$$

$$\Delta LUNE_t = \beta_{05} + \sum_{i=1}^{p} \alpha_{15}\, \Delta LUNE_{t-i} + \sum_{i=1}^{q} \alpha_{25}\, \Delta LEXPO_{t-i} + \sum_{i=1}^{q} \alpha_{35}\, \Delta LINV_{t-i} + \sum_{i=1}^{q} \alpha_{45}\, \Delta LGVE_{t-i} + \sum_{i=1}^{q} \alpha_{55}\, \Delta LGDP_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \quad \text{.....(13)}$$

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

3.6 Diagnostics Tests

Serial Correlation: Breusch-Godfrey Serial Correlation LM test is conducted to determine the serial correlation in the model.

Heteroskedasticity Test: Breusch Pegan Godfrey test is conducted to find out if the condition of Heteroskedacity exist in the model or not.

Normality test: Jarque-Bera test is conducted to find whether the residuals are normal distributed in the model or not.

Stability Test: The stability of the parameter is estimated from cumulative sum (CUSUM) and cumulative sum of square CUSUMSQ and RAMSEY RESET tests.

4. RESULTS

4.1 Unit Root Test

The ARDL methodology requires the study to test the data employed for unit root or stationarity and assure that there is no variable that is stationary at second difference. To avoid spurious results, the data is tested for stationarity to assure that the variables are stationary at level or first difference or the combination of I(0) and I(1) but not I(2). The study employed the Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) techniques and the results are presented in Table 1.

Table 2 shows that the variables have a stationary significance at 1%, 2.5%, 5% and 10%. The study therefore rejects the null hypothesis that the variables have a unit root and concludes that variables are stationary at first difference or they are integrated of I(1). Table 1 shows that we fail to reject the null hypothesis that the variables are stationary and therefore conclude that the variables are stationary at first difference. This means we can now be able to employ the ARDL model proposed by Pesaran et al. (2001) since it assumes that the variable should be integrated of I(0) or I(1) or a mixture of I(0) and I(1) but no variable should be integrated of I(2).

The ADF and PP unit root test confirmed that the variables are integrated of order one I(1), the study proceeds to conduct the lag length criterion to select the appropriate lag for the model. As shown in Table 4, all criterion except for the Log Likelihood select lag one. Based on the optimal lag of 1, the ARDL Bound testing to cointegration is performed. The results in Table 3 below show that there is a long run relationship among the variables in the model since the absolute value of F-statistic (6.864121) is greater than the I(0) and I(1) critical values which infer the rejection of null hypothesis of no long run relationship.

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

Table 2. ADF and PP Unit Root Test

Variables	ADF unit root test			
	Constant		Trend & Intercept	
	I(0)	I(I)	I(0)	I(I)
LGDP	-0.7575	-3.8539*	-2.1466	-3.8974**
LGVE	-6.5162*	-4.1682*	-2.0306	-7.0115*
LINV	-0.9927	-3.6702*	-2.4521	-3.7278**
LEXPO	-5.2235*	-6.0276*	-5.5456*	-5.9096*
LUNE	-2.1446	-6.5850*	-2.8653	-6.6191*
PP unit root test				
LGDP	-0.6036	-3.8101*	-2.3547	-3.8101*
LGVE	-7.3196*	-4.3131*	-2.1904	-6.9413*
LINV	-1.1296	-3.3343**	-1.5239	-3.3474***
LEXPO	-5.1549*	-19.1958*	-10.1241*	-23.3881*
LUNE	-2.7259***	-8.2875*	-2.6576	-11.6639*

Note: *, **, ***, significance at 1%, 5% and 10% respectively.

Table 3. Lag Length Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-16.71996	NA	2.38e-06	1.241141	1.463333	1.317841
1	31.34645	79.65291*	6.48e-07*	-0.076940*	1.256215*	0.383265*
2	48.58973	23.64793	1.11e-06	-0.366301	2.810419	1.210010
3	80.09723	34.20814	9.86e-07	-0.005556	3.549525	1.221657

Source: Author's own computation

Table 4. ARDL Bound Test to Cointegration

Null Hypothesis	No levels relationship	
Optimum Lag	4	
F-statistic	6.864121	
Significance	**Lower bound**	**Upper bound**
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: Author's own computation

Upon determining the presence of cointegration in the model, the study continues to estimate long run relationship by employing the ARDL model. The long run estimation relationship of the specified variables on economic growth in South Africa is estimated

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

by employing an ARDL model proposed by Pesaran et al. (2001). By utilising equation 1 in section 3, the results are presented in Table 5 below:

Table 5. ARDL Long Run Results

Variable	Coefficient	Standard Error	Prob
LGVE	-0.117955	0.083609	0.1689
LINV	0.048118	0.073080	0.5155
LEXPO	4.85E-05	0.000254	0.8495
LUNE	-0.004097*	0.002327	0.0888

Note: *, ** and *** significance at 10%, 5% and 1% respectively.

From the results given in Table 4 above, there is a negative statistically insignificant long run relationship between government expenditure and economic growth in South Africa. A 1% increase in unemployment in the long run, will insignificantly result in economic growth declining by 0.12% in South Africa, ceteris paribus. These results are consistent with the studies conducted by Odhiambo (2015), M. F. Oladele (2016) and Molefe et al. (2017) that found a negative relationship between government expenditure and economic growth in South Africa in the long run. Though the results are insignificant in the long run, the negative impact on economic growth means that higher government expenditure in the long run is not good for economic growth in South Africa. This might be caused by inefficiency and the degree of corruption in government expenditure, as stated by Wu et al. (2010).

There is a positive statistically insignificant relationship between investment and economic growth in the long run in South Africa. A 1% increase in investment in the long run in South Africa, will insignificantly result in economic growth increasing by 0.05%, ceteris paribus. The result vis-a-vis positive relationship between investment and economic growth are consistent with the studies carried by Gadinabokao et al. (2013), Chipaumire et al. (2014) and M. F. Oladele (2016). Though the results are insignificant, the positive contribution means that investment in the long run plays an important role on the growth of the South African economy and emphasis must be placed on investment as it boosts economic growth.

There is a positive statistically insignificant long run relationship between exports and economic growth in South Africa. A 1% increase in exports in the long run in South Africa, will insignificantly result in economic growth increasing by 4.85%, ceteris paribus. Though the results are insignificant, the positive contribution means that increase in exports in the long run plays an important role on the growth of South African economy. These results are consistent with the studies conducted in the past (Dinç et al., 2019; Edo et al., 2020; M.-H. Liu et al., 2019). This means the government and policymakers must promote exports in the long run to boosts the growth of South African economy.

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

There is a negative statistically significant long run relationship between unemployment and economic growth in South Africa. A 1% increase in unemployment in the long run will significantly reduce economic growth by 0.004% in South Africa, ceteris paribus. These results are in line with (Leasiwal, 2021; Padder et al., 2021; Samarah, 2021) mean that unemployment is detrimental on the growth of South African economy in the long run and more emphasis must be placed on ways to reduce unemployment as this will boost economic growth. Policies that reduce unemployment must be given priority as to increase economic growth in the long run. The study notes that some of the relationships displayed by the model may not be harmonious with the theory.

Table 6. ECM Regression of ARDL

VARIABLE	COEFFICIENT	PROBABILITY
DLGDP (-1)	0.293207*	0.0857
DLGVE(-1)	0.152132***	0.0003
DLINV(-1)	0.130746***	0.0000
DLEXPO(-1)	3.43	0.8492
DLUNE(-1)	-0.002896**	0.0442
ECT(-1)	-0.706793***	0.0000
R-SQUARED	0.738997	
Adjusted R^2	0.723644	
Durbin Watson	1.792050	

Note: *, ** and *** significance at 10%, 5% and 1% respectively.

The results of the error correction model are given in Table 6 below and as shown, the ECT (-1) coefficient is -0.71 and it is statistically significant with a p-value of 0.0000. This suggests that 71% of the error in GDP is corrected annually. There is a positive short run statistically significant between government expenditure, investment, and economic growth in South Africa. A 1% increase in government expenditure in the short run will significantly increase economic growth by 0.15% in South Africa, ceteris paribus. These results are consistent with the results found by Yang (2020), Zakaria et al. (2019), Chu et al. (2020) and Ahuja et al. (2020) who demonstrate the positive contribution of government expenditure on economic growth. This means that the South African government must increase its spending for the economy to grow in the short run. This means that government expenditure plays an important role in terms of the growth of the South African economy in the short run.

There is a positive statistically significant relationship between investment and economic growth in the short run in South Africa. A 1% increase in investment in the short run in South Africa will lead to an increase in economic growth by 0.13%, ceteris paribus. This means that investment plays an important role on the growth of the South African economy in the short run, and this calls for emphasis to be placed on investment for the economy to grow. Policies that favour investment in the short run must be of

priority as this will increase investment, thereby increasing the growth of South African economy.

There is a short run negative statistically significant relationship between unemployment and economic growth in South Africa. For a 1% increase in unemployment, there is a reduction in economic growth by 0.003% in the short run in South Africa, ceteris paribus. This means that unemployment is detrimental for the growth of South African economy in the short run, calling for emphasis on efforts to reduce unemployment to increase economic growth.

Exports have a positive statistically insignificant relationship with economic growth in the short run in South Africa. A 1% increase in exports in the short run in South Africa, will insignificantly increase economic growth by 3.43%, ceteris paribus. Though the results are insignificant, exports are still important for the growth of the South African economy in the short run as they contribute positively. This means that exports should be promoted in the short run as they boost economic growth in South Africa.

The study employs serial correlation test, heteroskedasticity test, RAMSEY RESET test and CUSUM test. The results are shown in Table 7, 8, 9 and Figures 1, 2 and 3 below.

The results show that the probability for all the four residual diagnostic tests (Breusch-Pagan-Godfrey, Harvey, Glesjer and ARCH) is greater than 0.05 or 5% which means that we cannot reject the null hypothesis (Ho) of homoskedasticity. This concludes that there is no heteroskedasticity present in the residuals of our selected model. These results are consistent with the prior expectations of our mode,l as stated in the preceding chapter, that is, a good model must not suffer from heteroskedasticity of the residuals.

Table 7. Heteroskedasticity Test

TEST	PROBABILITY	DECISION
Breusch-Pagan-Godfrey	0.1211	Fail to reject Ho
Harvey	0.2508	Fail to reject Ho
Glesjer	0.1465	Fail to reject Ho
ARCH	0.3865	Fail to reject Ho

Source: Author's own computation

Table 8. Serial Correlation Test

Breusch Godfrey Serial Correlation			
Null hypothesis	**No serial correlation at up to 1 lag**		
F-statistic	0.599763	Prob. F (1.28)	0.4452
Obs*R-squared	0.775923	Prob. Chi-Square (1)	0.3784

Source: Author's own computation

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

The results of the Breusch-Pagan-Godfrey serial correlation test above show a probability Chi-Square of 0.3784 which means that we fail to reject the null hypothesis (Ho) of no serial correlation up to 1 lag that was used in the study. We can therefore conclude that there is no serial correlation present in the residual from the model utilised in the study.

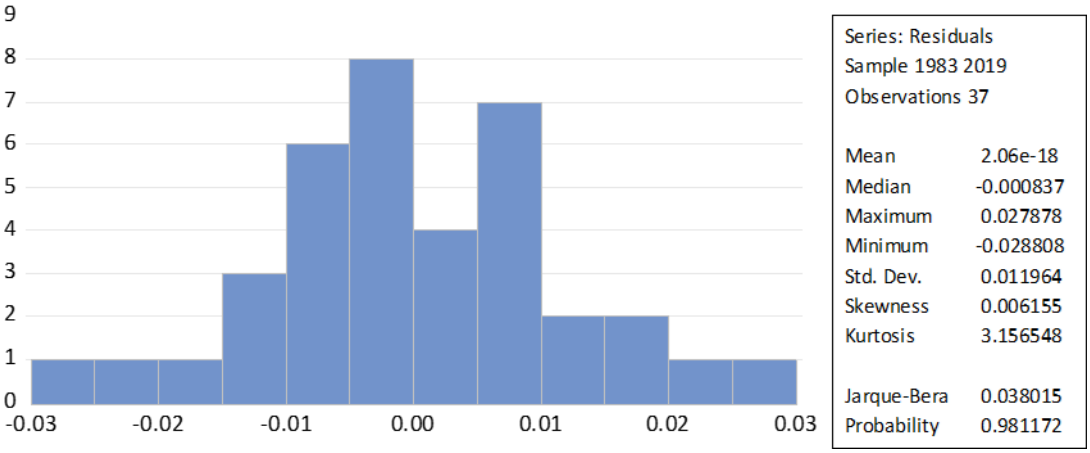

Figure 1: Histogram Normality Test
Source: Author's own computation

As show in Figure 1, the Jarque-Bera statistic is 0.038015 and its probability value is 0.981172. The probability value of the JB-statistic is greater than 5%, therefore we fail to reject the null hypothesis (Ho) and conclude that the residuals are normally distributed for our model. These results are consistent with the prior expectations from the model as explained in the preceding chapter.

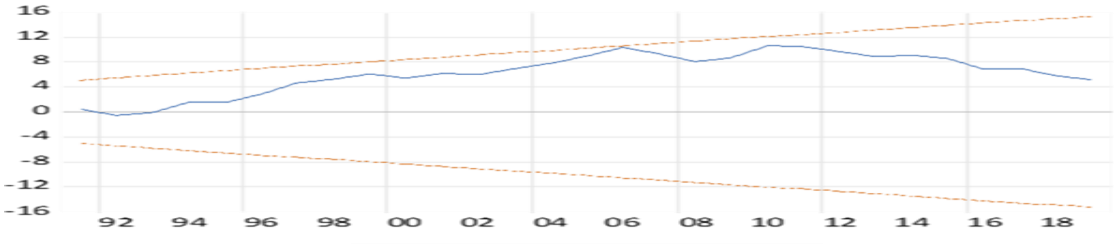

Figure 2. CUSUM

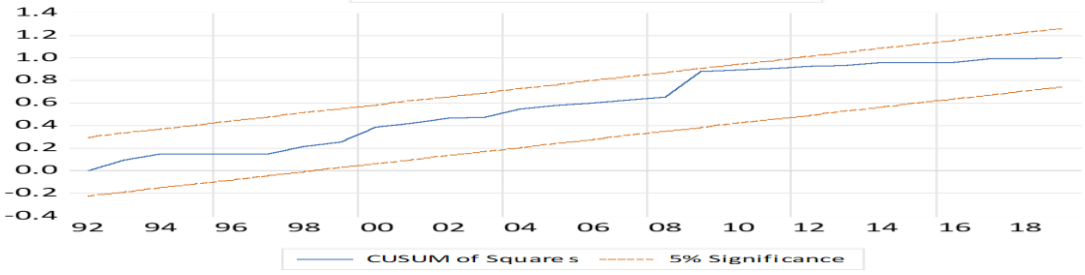

Figure 3: CUSUM of Squares

Vol: 13 **No:** 1 **Year:** 2021 **ISSN**: 1309-8055 (Online) (**pp.** 131-159) **Doi:** 10.34109/ijefs.20212007

Source: Author's own computation

As shown in Figure 2 and 3 above, the results of the CUSUM and CUSUM square test shows that the model is stable as indicated by the blue lines lying within the 5% critical regions. The blue line trend in Figure 2 and Figure 3, drifts upwards and downwards without overshooting the 5% (red lines) meaning the residuals are stable for the period understudy. In simple terms, this confirms that our chosen model for the study is stable and reliable.

Table 9. Ramsey Reset Test

Tests	Value	df	Prob
T-statistic	0.727737	28	0.4728
F-statistic	0.599601	(1.28)	0.4728
Likelihood ratio	0.693294	1	0.4050

Source: Author's own computation

The results in Table 8 above from the Ramsey test have the F-statistical probability of 0.4728 that is above 5%. This means that we fail to reject the null hypothesis and conclude that the model was correctly specified for analysing the relationship between the variables for the period understudy and linearity in the data used.

5. CONCLUSION AND RECOMMENDATIONS

The major aim of this study was to analyse, using annual time series data from 1981 to 2019, the nature of relationship between government expenditure and economic growth in South Africa. The study achieved this goal by employing techniques like stationarity testing (ADF and PP) and ARDL Bounding test to cointegration, Autoregressive Distributed Lag model (ARDL) model, Error Correction Model (ECM) and diagnostic testing. The unit root test has shown that the variables in the study are in line with I(1). The cointegration test of ARDL Bound testing demonstrated a long run relationship between the understudy variables, whereas the ARDL revealed long run relationships, and the ECM gave short run dynamics. The results indicated a negative statistically insignificant relationship and positive short run statistically significant relationship between government expenditure and economic growth. The results show the impacts of government expenditure on South African economy. The error correction results revealed a 71 per cent speed of adjustment per annum. The policy or practical implications from this study, as based on the empirical evidence, are:

Firstly, the positive relationship between government expenditure and economic growth in the short run means that government expenditure should be used as a short run stabilisation tool as it increases economic growth. Policies that increase government expenditure in the short run should be prioritized in implementation, monitoring, and evaluation to reduce duplication of projects as this will stimulate economic growth in

South Africa. Results from both ARDL and ECM revealed that the Keynesian approach is applicable in South Africa and can be implemented as a short run stabilisation tool based on the empirical results.

Secondly, the negative relationship between government expenditure and economic growth in the long run call for the government to audit its expenditures on monthly and quarterly basis so that it can trace if the funds were used for what they were intended for with a view to create a significant positive relationship in the long run on the growth of South African economy. Government is lacking accountability of the funds so it must undertake efforts to ensure the accountability of funds used to sponsor its projects. South Africa has been experiencing problems of higher corruption where funds are looted and not used for what they released for. This will help the government keeping track of every pen at their disposal and whether there is correlation between amount of money released for the project and the actual cost of the project.

Thirdly, the positive relationship between domestic investment and economic growth in the short and long run calls for policymakers to acknowledge the role and impact of investment in South Africa as it makes a significant and positive contribution to the growth of the South African economy both in the short and long run. The government should therefore propose and implement policies that favour investment as that can boost economic growth in both the short run and long run and consequently help reduce the effects of macroeconomic challenges resulting from unemployment and inequality.

Fourthly, the positive relationship between exports and economic growth, in both short run and long run in South Africa, calls for the government and policy makers to propose and implement export promotion policies as exports boost economic growth both in the short and long run period. This can include policies such as tax exceptions, subsidies, and credit lines. South Africa is importing more than it is exporting which represents a leakage in the circular flow and therefore, the government needs to focus more on manufacturing to increase its exports. This will ultimately increase the volume of exports as well as domestic production which, in turn, will spur economic growth while militating the prevailing macroeconomic challenge of a high unemployment rate.

Fifthly, the negative relationship between unemployment and economic growth in South Africa in the short and long run call for policy makers to propose policies that encourage labour-intensive production processes, and provide incentives for labour-intensive projects and promote labour-intensive industrial growth in order to reduce the unemployment rate. This is so because it will increase the number of people employed and therefore, stimulate economic growth. This will help absorb the larger pool of unemployment at the same time capturing the negative impact of unemployment on economic growth.

Researchers in the future should consider including variables such as inflation rate and inequality in the study to determine their impact on economic growth and accordingly

propose policies for solving these macroeconomic problems in South Africa. In conclusion, the study evaluated the relationship between unemployment and economic growth in South Africa from 1981 to 2019 and found out that government expenditure has been increasing throughout the stated period while economic growth has been declining. Therefore, policies to increase economic growth and improve government expenditure have been proposed in the study.

REFERENCE LIST

Abu-Eideh, O. (2015). Causality between public expenditure and GDP growth in Palestine: An econometric analysis of Wagner's law. *Journal of Economics and Sustainable Development, 6*(2), 189-199. doi:https://core.ac.uk/download/pdf/234646836.pdf

Agostino, G. d., Dunne, J. P., & Pieroni, L. (2016). Government Spending, Corruption and Economic Growth. *World Development, 84*, 190-205. doi:https://doi.org/10.1016/j.worlddev.2016.03.011

Ahuja, D., & Pandit, D. (2020). Public expenditure and economic growth: Evidence from the developing countries. *FIIB Business Review, 9*(3), 228-236. doi:https://doi.org/10.1177%2F2319714520938901

Altunc, O. F., & Aydın, C. (2013). The relationship between optimal size of government and economic growth: Empirical evidence from Turkey, Romania and Bulgaria. *Procedia-Social and Behavioral Sciences, 92*, 66-75. doi:https://doi.org/10.1016/j.sbspro.2013.08.639

Aluthge, C., Jibir, A., & Abdu, M. (2021). Impact of government expenditure on economic growth in Nigeria, 1970-2019. *CBN Journal of Applied Statistics, 12*(1), 139-174. doi:http://dx.doi.org/10.33429/Cjas.12121.6/6

Anisaurrohmah, A., Rizali, H., & Rahmini, N. (2020). Investment, Man Power and Government Expenditure on Economic Growth in Development of Three Area in South Kalimantan. *International Journal of Business, Economics and Management, 3*(1), 140-147. doi:https://dx.doi.org/10.31295/ijbem.v3n1.162

Anwar, A., Sriyana, J., & Shidiqie, J. S. A. (2020). The impact of government spending spillovers on regional economic growth. *Montenegrin Journal of Economics, 16*(2), 59-76. doi:http://dx.doi.org/10.14254/1800-5845/2020.16-2.5

Arvin, M. B., Pradhan, R. P., & Nair, M. S. (2021). Are there links between institutional quality, government expenditure, tax revenue and economic growth? Evidence from low-income and lower middle-income countries. *Economic Analysis and Policy, 70*, 468-489. doi:https://doi.org/10.1016/j.eap.2021.03.011

Aslan, A., & Altinoz, B. (2021). The impact of natural resources and gross capital formation on economic growth in the context of globalization: evidence from developing countries on the continent of Europe, Asia, Africa, and America. *Environmental Science and Pollution Research, 28*(26), 33794-33805. doi:10.1007/s11356-021-12979-7

Babatunde, S. A. (2018). Government spending on infrastructure and economic growth in Nigeria. *Economic research-Ekonomska istraživanja, 31*(1), 997-1014. doi:https://doi.org/10.1080/1331677X.2018.1436453

Barlas, A. W. (2020). The Impact of Government Expenditure on Economic Growth in Afghanistan. *Journal of Economics and Business, 3*(2), 729-733. doi:10.31014/aior.1992.03.02.234

Chipaumire, G., Ngirande, H., & Ruswa, Y. (2014). The impact of government spending on economic growth: case South Africa. *Mediterranean Journal of Social Sciences, 5*(1), 109-118. doi:http://dx.doi.org/10.5901/mjss.2014.v5n1p109

Chu, T. T., Hölscher, J., & McCarthy, D. (2020). The impact of productive and non-productive government expenditure on economic growth: an empirical analysis in high-income versus low-to middle-income economies. *Empirical Economics, 58*(5), 2403–2430. doi:https://doi.org/10.1007/s00181-018-1616-32403-2430

Colombier, C. (2011). Does the composition of public expenditure affect economic growth? Evidence from the Swiss case. *Applied Economics Letters, 18*(16), 1583-1589. doi:https://doi.org/10.1080/13504851.2011.554361

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica: journal of the Econometric Society, 49*(4), 1057-1072. doi:https://doi.org/10.2307/1912517

Dinç, D. T., & Gökmen, A. (2019). Export-led economic growth and the case of Brazil: An empirical research. *Journal of Transnational Management, 24*(2), 122-141. doi:10.1080/15475778.2019.1609895

DİNÇER, H., & YUKSEL, S. (2019). Identifying the causality relationship between health expenditure and economic growth: An application on E7 countries. *Journal of Health Systems and Policies, 1*(1), 5-23. doi:https://dergipark.org.tr/en/pub/jhesp/issue/39338/413742

Divino, J. A., Maciel, D. T. G. N., & Sosa, W. (2020). Government size, composition of public spending and economic growth in Brazil. *Economic Modelling, 91*, 155-166. doi:https://doi.org/10.1016/j.econmod.2020.06.001

Dudzevičiūtė, G., Šimelytė, A., & Liučvaitienė, A. (2018). Government expenditure and economic growth in the European Union countries. *International Journal of Social Economics, 45*(2), 372-386. doi:https://doi.org/10.1108/IJSE-12-2016-0365

Edo, S., Osadolor, N. E., & Dading, I. F. (2020). Growing external debt and declining export: The concurrent impediments in economic growth of Sub-Saharan African countries. *International Economics, 161*, 173-187. doi:https://doi.org/10.1016/j.inteco.2019.11.013

Facchini, F., & Seghezza, E. (2018). Public spending structure, minimal state and economic growth in France (1870–2010). *Economic Modelling, 72*, 151-164. doi:https://doi.org/10.1016/j.econmod.2018.01.014

Froyen, R. T. (2013). Macroeconomics In (10 ed.). Boston: Pearson.

Gadinabokao, L., & Daw, D. (2013). An empirical examination of the relationship between government spending and economic growth in South Africa, from 1980 to 2011. *Mediterranean Journal of Social Sciences, 4*(3), 235-242. doi:10.5901/mjss.2013.v4n3p235

Ghose, A., & Das, S. (2013). Government size and economic growth in emerging market economies: a panel co-integration approach. *Macroeconomics and Finance in Emerging Market Economies, 6*(1), 14-38. doi:https://doi.org/10.1080/17520843.2012.697075

Gukat, B. T., & Ogboru, I. (2017). An empirical analysis of government expenditure and economic growth in Nigeria. *Journal of Economics and Development Studies, 5*(4), 122-134. doi:https://doi.org/10.15640/jeds.v5n4a11

Gurdal, T., Aydin, M., & Inal, V. (2021). The relationship between tax revenue, government expenditure, and economic growth in G7 countries: new evidence from time and frequency domain approaches. *Economic Change and Restructuring, 54*(2), 305-337. doi:https://doi.org/10.1007/s10644-020-09280-x

Hicham, A. (2020). Government Expenditure and Economic Growth Nexus in Mena Countries: Frequency Domain Spectral Causality Analysis. *Economics and Business, 34*(1), 60-77. doi:https://doi.org/10.2478/eb-2020-0005

Idris, M., & Bakar, R. (2017). Public sector spending and economic growth in Nigeria: In search of a stable relationship. *Asian Research Journal of Arts & Social Sciences, 3*(2), 1-19. doi:https://doi.org/10.9734/ARJASS/2017/33363

Iniguez-Montiel, A. J. (2010). Government expenditure and national income in Mexico: Keynes versus Wagner. *Applied Economics Letters, 17*(9), 887-893. doi:https://doi.org/10.1080/13504850802599433

Iwegbunam, I. A. (2017). *Government Expenditure and Economic Growth in South Africa: Causality and Cointegration Nexus.* (Master of Commerce-Economics Dissertation). University of South Africa, Retrieved from http://hdl.handle.net/10500/25288

Keynes, J. M. (1936). The general theory of interest, employment and money. In. London: MacMillan.

Kouassi, K. B. (2018). Public Spending and Economic Growth in Developing Countries: a Synthesis. *Financial Markets, Institutions and Risks, 2*(2), 22-30. doi:10.21272/fmir.2(2).22-30.2018

Kumar, S., Webber, D. J., & Fargher, S. (2012). Wagner's Law revisited: cointegration and causality tests for New Zealand. *Applied Economics, 44*(5), 607-616. doi:https://doi.org/10.1080/00036846.2010.511994

Lamdjed, M., Riadh, R., & Mohammed, T. (2020). (The Asymmetric Impact of Economic Growth on Unemployment in Algeria-Testing the Okun's Law (Empirical study for the period 1980-2018. *Journal of Economic Insights, 10*(2), 13-26. doi:https://www.asjp.cerist.dz/en/article/131528

Leasiwal, T. C. (2021). A LONGITUDINAL ANALYSIS OF THE EFFECT OF WAGES, INFLATION, ECONOMIC GROWTH ON UNEMPLOYMENT

RATE IN MALUKU PROVINCE, INDONESIA. *International Journal of Entrepreneurship, 25*(6), 1-11. doi:https://www.proquest.com/openview/a0a6d673915ccd8ae780ddaf34fc12c4/1?pq-origsite=gscholar&cbl=29727

Liu, M.-H., Margaritis, D., & Zhang, Y. (2019). The Global Financial Crisis and the Export-Led Economic Growth in China. *The Chinese Economy, 52*(3), 232-248. doi:10.1080/10971475.2018.1548144

Liu, Q., & Ren, D. (2015). Research on the structure of public fiscal expenditure based on the cluster analysis methods. *Modern Economy, 6*(06), 700-706. doi:http://dx.doi.org/10.4236/me.2015.66066

Lupu, D., Petrisor, M. B., Bercu, A., & Tofan, M. (2018). The impact of public expenditures on economic growth: A case study of Central and Eastern European countries. *Emerging Markets Finance and Trade, 54*(3), 552-570. doi:https://doi.org/10.1080/1540496X.2017.1419127

Lyeonov, S., Pimonenko, T., Bilan, Y., Štreimikienė, D., & Mentel, G. (2019). Assessment of Green Investments' Impact on Sustainable Development: Linking Gross Domestic Product Per Capita, Greenhouse Gas Emissions and Renewable Energy. *Energies, 12*(20), 112. doi:http://dx.doi.org/10.3390/en12203891

Magdalena, S., & Suhatman, R. (2020). The Effect of Government Expenditures, Domestic Invesment, Foreign Invesment to the Economic Growth of Primary Sector in Central Kalimantan. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal), 3*(3), 1692-1703. doi:https://doi.org/10.33258/birci.v3i3.1101

Masipa, T. S. (2018). The relationship between foreign direct investment and economic growth in South Africa: Vector error correction analysis. *Acta Commercii, 18*(1), 1-8. doi:https://hdl.handle.net/10520/EJC-eb1641601

Mazni, M. (2017). *Government expenditure and economic growth: Evidence from panel data.* (Masters thesis). Universiti Utara Malaysia, Malaysia. Retrieved from https://etd.uum.edu.my/id/eprint/7029 (7029)

Meyer, D. F., & Sanusi, K. A. (2019). A causality analysis of the relationships between gross fixed capital formation, economic growth and employment in South Africa. *Studia Universitatis Babes-Bolyai Oeconomica, 64*(1), 33-44. doi:https://doi.org/10.2478/subboec-2019-0003

Mishra, B. R., & Mohanty, A. R. (2021). Nexus between government expenditure and economic growth: Evidence from sub-national governments in India. *The Journal of Developing Areas, 55*(2), 281-296. doi:https://doi.org/10.1353/jda.2021.0045

Molefe, K., & Choga, I. (2017). Government expenditure and economic growth in South Africa: a vector error correction modeling and Granger Causality Test. *Journal of Economics and Behavioral Studies, 9*(4), 164-172. doi:https://doi.org/10.22610/jebs.v9i4.1831

Munir, K., & Javed, Z. (2018). Export composition and economic growth: evidence from South Asian countries. *South Asian Journal of Business Studies, 7*(2), 225-240. doi:10.1108/SAJBS-10-2017-0117

Nartea, G., & Hernandez, J. (2020). Government size, the composition of public spending and economic growth in Netherland. *Journal of Accounting, Business and Finance Research, 9*(2), 82-89. doi:https://doi.org/10.20448/2002.92.82.89

Nworji, I. D., Okwu, A. T., Obiwuru, T., & Nworji, L. O. (2012). Effects of public expenditure on economic growth in Nigeria: A disaggregated time series analysis. *International journal of management sciences and business research, 1*(7), 1-15. doi:https://core.ac.uk/download/pdf/228010214.pdf

Nyarko-Asomani, A., Bhasin, V. K., & Aglobitse, P. B. (2019). Government capital expenditure, recurrent expenditure and economic growth in Ghana. *Ghanaian Journal of Economics, 7*(1), 44-70. doi:https://hdl.handle.net/10520/EJC-1b2f6ea97f

Odhiambo, N. M. (2015). Government expenditure and economic growth in South Africa: An empirical investigation. *Atlantic Economic Journal, 43*(3), 393-406. doi:https://doi.org/10.1007/s11293-015-9466-2

Olabisi, A. S., & Oloni, E. F. (2012). Composition of public expenditure and economic growth in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences, 3*(4), 403-407. doi:https://hdl.handle.net/10520/EJC126566

Oladele, M., Mah, G., & Mongale, I. (2017). The role of government spending on economic growth in a developing country. *Risk governance & control: financial markets & institution, 7*(2), 140-146. doi:http://dx.doi.org/10.22495/rgcv7i2c1p2

Oladele, M. F. (2016). *An investigation of the relationship between economic growth and government expenditure: the case of South Africa.* (MCom (Economics) Thesis). North-West University, South Africa. Retrieved from http://hdl.handle.net/10394/36860

Olaoye, O., & Afolabi, O. (2021). Government spending and economic growth: a trivariate causality testing. *African Journal of Economic and Management Studies, 12*(2), 250-268. doi:10.1108/AJEMS-07-2020-0334

Onyinye, N. G., Idenyi, O. S., & Ifeyinwa, A. C. (2017). Effect of capital formation on economic growth in Nigeria. *Asian Journal of Economics, Business and Accounting, 5*(1), 1-16. doi:https://doi.org/10.9734/AJEBA/2017/36075

Öztürk, Ö., Şişman, M. Y., Uslu, H., & Çıtak, F. (2020). Effect of COVID-19 outbreak on Turkish stock market: a sectoral-level analysis. *Hitit University Journal of Social Sciences Institute, 13*(1), 56-68. doi:https://doi.org/10.17218/hititsosbil.728146

Padder, A. H., & Mathavan, B. (2021). The Relationship between Unemployment and Economic Growth in India: Granger Causality Approach. *NVEO-NATURAL VOLATILES & ESSENTIAL OILS Journal, 8*(4), 1265-1271. doi:http://www.nveo.org/index.php/journal/article/view/261

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics, 16*(3), 289-326. doi:https://doi.org/10.1002/jae.616

Phiri, A. (2019). Does military spending nonlinearly affect economic growth in South Africa? *Defence and Peace Economics, 30*(4), 474-487. doi:https://doi.org/10.1080/10242694.2017.1361272

Puatwoe, J. T., & Piabuo, S. M. (2017). Financial sector development and economic growth: evidence from Cameroon. *Financial Innovation, 3*(1), 1-18. doi:https://doi.org/10.1186/s40854-017-0073-x

Samarah, W. A. (2021). Evaluating the Effect of Covid-19 on the Palestinian Economy by Estimating the Relationship Between Economic Growth and Unemployment in Palestine. *Studies in Business and Economics, 16*(2), 206-217. doi:https://sciendo.com/pdf/10.2478/sbe-2021-0034

Samuel, U. D., & Oruta, I. L. (2021). Government expenditure and economic growth in Nigeria: A disaggregated analysis. *Path of Science, 7*(11), 4022-4035. doi:http://dx.doi.org/10.22178/pos.76-6

Selvanathan, E. A., Selvanathan, S., & Jayasinghe, M. S. (2021). Revisiting Wagner's and Keynesian's propositions and the relationship between sectoral government expenditure and economic growth. *Economic Analysis and Policy, 71*(1), 355-370. doi:https://doi.org/10.1016/j.eap.2021.05.005

Shabani, Z. D., & Shahnazi, R. (2019). Energy consumption, carbon dioxide emissions, information and communications technology, and gross domestic product in Iranian economic sectors: A panel causality analysis. *Energy, 169*, 1064-1078. doi:https://doi.org/10.1016/j.energy.2018.11.062

Sharma, R. (2018). Health and economic growth: Evidence from dynamic panel data of 143 years. *PloS one, 13*(10), e0204940. doi:https://doi.org/10.1371/journal.pone.0204940

Sintha, A. D., Suryantoro, A., & Mulyanto, M. (2021). The Effect of Educational Technology Development and Economic Growth on Open Unemployment in Indonesia. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 4*(2), 3293-3293x. doi:https://doi.org/10.33258/birci.v4i2.2208

Soylu, Ö. B., Çakmak, İ., & Okur, F. (2018). Economic growth and unemployment issue: Panel data analysis in Eastern European Countries. *Journal of International Studies, 11*(1), 93-107. doi:10.14254/2071-8330.2018/11-1/7

StatsSA. (2020). *A breakdown of national government spending in 2019/20*. Retrieved from http://www.statssa.gov.za/?p=14484

Sultanuzzaman, M. R., Fan, H., Akash, M., Wang, B., & Shakij, U. S. M. (2018). The role of FDI inflows and export on economic growth in Sri Lanka: An ARDL approach. *Cogent Economics & Finance, 6*(1), 1518116. doi:10.1080/23322039.2018.1518116

Tacchella, A., Mazzilli, D., & Pietronero, L. (2018). A dynamical systems approach to gross domestic product forecasting. *Nature Physics, 14*(8), 861-865. doi:10.1038/s41567-018-0204-y

Topcu, E., Altinoz, B., & Aslan, A. (2020). Global evidence from the link between economic growth, natural resources, energy consumption, and gross capital formation. *Resources Policy, 66*, 101622. doi:https://doi.org/10.1016/j.resourpol.2020.101622

Udoy, K. A. (2021). Impact of COVID-19 Pandemic on Global Economy and the Direct and Indirect Impact on Bangladesh Economy. *Social Science Research Network*. doi:https://dx.doi.org/10.2139/ssrn.3818606

Uysal, Ö., & Sultan, S. (2019). The causal relationship between economic growth and export: The case of Russia. *İstanbul İktisat Dergisi, 69*(1), 43-65. doi:https://doi.org/10.26650/ISTJECON2019-0011

Valoyi, S. (2019). *Inflation, economic growth and government expenditure nexus in South Africa.* (M.Com Economics Thesis). University of Limpopo, Retrieved from http://hdl.handle.net/10386/2981

Wagner, A. (1958). Three extracts on public finance. In Musgrave R.A. & Peacock A.T. (Eds.), *Classics in the theory of public finance* (pp. 1-15). London: Springer, 1-15. doi:https://doi.org/10.1007/978-1-349-23426-4_1.

Wu, S.-Y., Tang, J.-H., & Lin, E. S. (2010). The impact of government expenditure on economic growth: How sensitive to the level of development? *Journal of Policy Modeling, 32*(6), 804-817. doi:https://doi.org/10.1016/j.jpolmod.2010.05.011

Yang, X. (2020). Health expenditure, human capital, and economic growth: an empirical study of developing countries. *International journal of health economics and management, 20*(2), 163-176. doi:https://doi.org/10.1007/s10754-019-09275-w

Yasmeen, H., Tan, Q., Zameer, H., Vo, X. V., & Shahbaz, M. (2021). Discovering the relationship between natural resources, energy consumption, gross capital formation with economic growth: Can lower financial openness change the curse into blessing. *Resources Policy, 71*, 102013. doi:https://doi.org/10.1016/j.resourpol.2021.102013

Zakaria, M., Jun, W., & Ahmed, H. (2019). Effect of terrorism on economic growth in Pakistan: an empirical analysis. *Economic research-Ekonomska istraživanja, 32*(1), 1794-1812. doi:https://doi.org/10.1080/1331677X.2019.1638290

Zungu, L. T., Greyling, L., & Sekome, M. S. (2020). Government expenditure and economic growth: Testing for nonlinear effect among SADC countries, 1994-2017. *African Journal of Business and Economic Research, 15*(3), 37-96. doi:https://hdl.handle.net/10520/EJC-1ff876e1de