Economic Globalisation and Public Debt: What Implications does an Integrated South African Economy Hold for Fiscal Policymakers?

MOITSHEPI MOENG, JACQUES DE JONGH

Abstract

Globalisation is a deep-rooted phenomenon that has significantly shaped developed and developing economies alike. Characterised by its controversial past, South Africa provides a unique case when considering how global integration has affected the country's economy. Among the more intriguing relationships has been the interlinkage between the country's public debt levels and the manner in which it has globalised. On one hand, advocates suggest that economic integration has enabled the government to provide greater social assistance in the hope of rectifying its controversial past. On the other hand, however, globalisation is believed to increase pressure on the fiscal budget with increased levels of debt needed to mitigate the pressure of external shocks. The primary objective of this study was to analyse the relationship between public debt and economic globalisation in South Africa. It followed a quantitative research approach using secondary time-series data from 1980 to 2020. Long-run relationships were evaluated through the use of a Bayer–Hanck combined cointegration test, while FMOLS, DOLS and CCR estimation techniques were employed to estimate elasticity relationships. The results corroborate the existence of a positive relationship between higher levels of economic globalisation and public debt. Moreover, the causality results revealed a unidirectional causal link between these variables emanating from the economic integration of the country. This implies significant consequences for fiscal policymakers towards balancing its role as a crucial macroeconomic role player. The findings in fact point to noteworthy implications surrounding the restricting effects of the integration process, pertaining to higher borrowing costs, increased external vulnerability and limited fiscal capability in the context of improving the country's social environment.

Key words

economic globalisation, government spending, public debt, KOF globalisation index, South Africa

DOI: 10.23762/FSO_VOL11_NO4_2

Moitshepi Moeng
e-mail: 31281907@mynwu.ac.za

Jacques de Jongh[1]
e-mail: Jacques.dejongh@nwu.ac.za

North-West University, School of Economic Sciences, TRADE research focus area

[1] Corresponding author

Paper received: 25 May 2023 • Paper revised: 19 August 2023 • Paper accepted: 1 December 2023

Introduction

Globalisation is a powerful force that has had a profound impact on shaping modern economic and social life (World Economic Forum (WEF), 2019). Generally, it is referred to as the integration of economies marked by the free flow of trade and capital, along with easy access to foreign resources and labour markets (Lutkevich, 2022). Friedman (2000, 9) describes it as "the inexorable integration of markets, transport systems, and communication systems to a degree never witnessed before – in a way that is enabling corporations, countries, and individuals to reach around the world farther, faster, and cheaper." However, as time has progressed, its understanding has been inextricably linked to a multidimensional concept, characterised mainly by three dimensions, focusing on the interconnectedness of the economic, social, and political landscapes of countries across the globe (Gygli et al., 2019). Among these, the former (i.e. economic globalisation) has arguably been the most pertinent, pertaining to aspects such as the establishment of lower transportation costs, comparative and competitive advantages, the liberalisation of trade and the irrepressible rise of modern technology (Figge and Martens, 2014). As such, it has influenced a myriad of factors, including aspects relating to the mobility of resources, an enhanced division of labour and the impact that the liberalisation of current accounts and capital markets have had on the wider socioeconomic wellbeing of economies.

In light of the influence of said process, the rationale for countries to integrate has been firmly based on the advantages it has to offer (Tsunekawa, 2019). On the one hand, advocates suggest that economic globalisation has brought with it greater levels of knowledge spillovers, consumption smoothing, and financial development, as well as greater levels of foreign investment (Raeskyesa and Suryandaru, 2020). On the other hand, however, sceptics point to specific deleterious effects, raising issues of the skill-biased nature of the process, the systemic core–periphery aspects of global networks, and the creation of higher levels of external economic vulnerability, especially in developing countries (Jenserud, 2018). While these debates have been rife, they have likewise manifested in the body of knowledge directed towards understanding the influence of global economic integration on the role and capacity of fiscal policymakers (Calitz, 2000; Wu et al., 2022). Acknowledging the fact that this process has both enabling and adverse consequences on the socioeconomic landscapes in this regard has raised important questions about the ability of fiscal policy to act as a key Keynesian spender in a macroeconomic framework. In fact, contrasting views have played out in the shape of two alternative theories. On the one hand, the efficiency theory maintains that economic globalisation has induced governments to reduce spending while maintaining important public goods through lower tax rates to ensure competitive financial conditions and attract foreign investment (Porto et al., 2016:02). However, on the other side of the spectrum, the compensation hypothesis suggests the opposite, emphasising that policymakers are set to increase government spending to respond to the potential adverse effects of economic globalisation (Sener et al., 2015).

Research into these debates has increased substantially over the last decade (Bataka, 2021; Wu et al., 2022). However, while the greatest focus in this regard has been directed towards understanding increases in government size and spending patterns, insight into the implications this has had on the sustainability of governments' fiscal budgets has remained largely unexplored (Yildiz and Sağdic, 2021). The relationship between economic globalisation and government debt in this respect has been a rather perplexing topic, given that it not only acknowledges

the impact of globalisation on spending, but so too revenue generation and the consequential dynamics between these two processes. This has further been complicated by the different motivations for countries to carry large levels of debt, their specific positions in the global economic network, and the consideration of their specific development trajectories (Kim et al., 2018). South Africa in particular presents an intriguing case. Unlike other countries, it has had a unique process of integration (Sebake, 2017). While most of its African counterparts were subjected to economic integration through the policies of the Bretton Woods Institutions, the apartheid regime left the country subject to multiple economic sanctions, excluding its participation in the global economy. It was only after 1990 that an internal adoption of the integration process started as the country transitioned to a democratic state and the adoption of the neoliberal framework that has become so closely associated with an increasingly interdependent world (de Jongh, 2022).

Since then, South Africa has seen notable progress in eradicating the wrongs of its past, in which fiscal policymakers have played a significant role (Inman and Rubinfield, 2013). Much like most of its sub-Saharan African partners, national budgets have largely been directed towards the social spheres of its society, including health and education (Barro, 2013). Moreover, it has established arguably one of the more advanced social security systems on the African continent, with more than 33% of the population being the beneficiaries of social grants. However, while its fiscal position has been relatively sound in the last four decades, recent trends in mounting fiscal debt have become a serious concern. From 2000 until 2019, the debt-to-GDP ratio in the country averaged 41.45%, reaching a low of 27.80% in 2008 (National Treasury, 2023). Since the end of the financial crisis in 2008, debt levels have continuously increased, reaching a high of 66.32% at the end of 2022 (IMF, 2023). During the course of that period, the country experienced significant changes in its economic integration as well. Considered a moderate globaliser, it has had to contend with a relatively volatile exchange rate, significant fluctuations in FDI inflows, and a poor current account performance (Ngondo and Khobai, 2018). In addition, it has consistently struggled to participate in emerging global value chains, faced additional social pressures associated with the COVID-19 outbreak (Kose et al., 2021), and struggled to move from its peripheral global position based on a lack of economic diversification.

While these trends have been intriguing from a practical viewpoint, various methodological considerations have made further insight into the dynamics between these two processes rather difficult. Key among these has been the fact that, where evidence has been provided, studies have mainly used proxies such as FDI and trade openness to measure globalisation, failing to capture the underlining multidimensionality of the process (Gygli et al., 2019). So too have these measures solely provided insight into the disturbances of actual flows or de facto processes. Evidence of the influence of these flows in conjunction with the policies (de jure) and institutions that enable them has rather been ignored by the extant literature (Leal et al., 2021). Taking this into account, the primary objective of the study was to examine the relationship between economic globalisation and public debt in South Africa. In doing so, the contribution of the study is threefold. On a theoretical level, it is among the first that seeks to place South Africa within this particular discourse, providing alternative context-specific insight into the debates on whether economic integration has either benefitted or deterred fiscal sustainability. Secondly, from a methodological perspective, the study aims to overcome the aforementioned shortcomings, using more comprehensive and holistic measures of the globalisation process. This would include

accounting for both de jure and de facto dynamics using the KOF Swiss Economic Institute's globalisation indices. It also aims to utilise alternative econometric techniques, with limited application within this field of study. Finally, the study also holds particular relevance for policymakers. Research providing notable insight into this relationship has the ability to act as a reference point for government strategies, not only in managing its finances within the interconnected global economic landscape, but also identifying areas in which the integration thereof requires alternative thinking.

1. Literature review

1.1. Relationship between public debt and economic globalisation

Constructing a working definition for globalisation has proved to be a challenging endeavour over the years. While some authors argue that it cannot be done, others claim that doing so would constrain the meaning; more venturous authors disregarded these beliefs and have attempted to define globalisation in various ways, with reasonable success (Al-Rodhan and Stoudman, 2006). In economic terms, globalisation generally refers to the growing integration, mainly through real and financial economic flows (Haelg, 2020), of economies throughout the world (IMF, 2002). According to Gygli et al. (2019) and Dreher (2006), economic globalisation can be referred to as the process that creates a network of connections between participants at both multi-continental and intercontinental distances, through various economic flows encompassing capital, trade, portfolio investment, and FDI along with all the information linked to such flows. In essence, it contributes to the removal of national borders and allows for access to technology that leads to interdependence and the integration of economies (Bataka, 2021). While struggling to find the ideal definition for this phenomenon, academics and policymakers also found themselves at odds with one another on the best way to measure globalisation.

As a matter of fact, most scholars have used proxies and single indicators such as capital flows and international trade (volume of exports and imports) to measure globalisation (Zafar and Butt, 2008; Çolak and Özkaya, 2020). While these single indicators have mostly been used in empirical literature as they provide insight into the key aspects of globalisation processes (Dreher et al., 2008), they do not paint a holistic picture of the globalisation processes (Mikalauskiene et al., 2016). Other measures that were previously used include the AT Kearney/Foreign policy (KFP) globalisation index, the DHL connectedness index, and the New Globalisation Index (NGI). However, when a phenomenon such as globalisation includes various aspects that, taken together, may have a considerable effect, it would be more logical to assess these effects in unison to avoid providing partial answers (Dreher et al., 2008). The KOF globalisation indices (KOF Swiss Economic Institute, 2023), which are regarded as the most comprehensive measures, offer a holistic measurement of globalisation. In relation to economic globalisation per se, the de jure aspect measures the conditions and policies that guide economic activities and flows in reality, while the de facto aspect measures the actual international economic activities and flows of a country (Leal and Marques, 2019).

Based on the aforementioned economic flows, some studies have shown the mixed theoretical relationship between economic globalisation and public debt (Lane and Milesi-Ferretti, 2000; Azzimonti et al., 2014). Public debt, interchangeably known as government debt, is often described as the sum of a central government's fixed-term contractual obligations to others

outstanding on a specific date (World Bank, 2022). While the existing literature indicates that the primary influence on public debt comes from socioeconomic, macroeconomic, structural, and institutional factors (Mothibi and Mncayi, 2019), it is often unclear whether public debt is also influenced by the economic flows that are encouraged by the integration of economies (Holtfrerich et al., 2016). When it comes to explaining this relationship between economic globalisation and public debt, theoretical literature also indicates that economic globalisation affects public debt levels by encouraging spending from governments that care to protect the well-being of their population from volatilities and uncertainties brought about by economic globalisation by raising their spending (through public debt) rather than increasing taxes (Bataka, 2021). If anything, they would rather decrease taxes in support of economic recovery or attract external investment. Additionally, uninsured idiosyncratic risks within the context of economic globalisation also tend to increase public debt in order to allow for consumption smoothing, as shown by Azzimonti et al. (2014), while trade liberalisation prompted by economic globalisation contributes to public debt because of the abolition of the trade tax (Zafar and Butt, 2008). Globalisation is a rather controversial phenomenon, and these relationships have sparked a new debate on whether economic globalisation is indeed worth the uncertainties it comes with, especially in developing countries that do not benefit from globalisation to the same extent as industrialised developed countries.

In support of economic globalisation, proponents have argued that trade liberalisation and FDIs are a source of financial assistance and can be a worthwhile contribution to solving the public debt issues of a country – if the additional revenue that is generated from improved domestic productivity, growth and exports is used to lighten the public debt and its service costs (Ostadi and Ashja, 2014). In sync with this argument is the perspective of hyperglobalists, who support globalisation on the basis that it is a positive phenomenon that uplifts the economy and allows for an increase in government spending through simplified external borrowing (Held et al., 1991). While increased expenditure through debt might not sound ideal, the Keynesian school of thought suggests that it is good for a government to possess some form of debt that is fully justified as a way of stabilising an economy (Keynes, 1937), especially one that is affected by external shocks. In contrast to these perspectives, opponents and sceptics question the benefits derived from globalisation by mainly focusing more on its costs, expecting them to exceed the benefits (Dreher et al., 2008). They argue that globalisation creates costs that tend to be centralised within a particular segment of the population who become vocal about their burden (Cuervo-Cazurra et al., 2020). For example, lower tariffs that are accompanied by lower prices and result in uncompetitive domestic firms may be beneficial to consumers who enjoy lower prices, but not to the uncompetitive domestic firms that close down, leading to job losses and threatening livelihoods. These costs not only encourage government spending, but further impede the government's ability to service existing debt (Burrie et al., 2020). Dreher et al. (2008) assert that globalisation restrains governments by prompting high budgetary pressure, consequently forcing governments to redirect their expenditures away from capital expenditures, such as the repayment of loans, and in favour of subsidies and transfers.

The efficiency and compensation hypotheses in this regard reiterate how the free flow that comes with globalisation affects the markets and social policy of

a country, which, in turn, affects government expenditure. The efficiency hypothesis (also known as the race-to-the-bottom hypothesis) predicts that moving production between countries where employment regulations are flexible and corporate taxes are moderate pressurises the local government to decrease corporate taxes and deregulate the labour market to attract those who are most likely to contribute rather than be a cost to the economy (de Jongh, 2020). Consequently, this affects the government's ability to sustain their debt and leaves the government with less income to spend on social policy, thereby encouraging an increase in their debt stock to bridge the gap to the lost income initially used for social spending (Lammers et al., 2018). Research studies on developing countries have mostly supported the efficiency hypothesis (Kaufman and Segura-Ubiergo, 2001; de Jongh, 2020). Contrastingly, the compensation theory holds that globalisation intensifies economic competition, inducing more volatile domestic economic environments that lead to open economies having larger public sectors (Bergh, 2021). In a globalised world, this implies that demand for social policy and protection increases in domestic economies so as to compensate those who are losing out due to increased economic competition brought about by globalisation (Rodrick, 1998). Consequently, this forces the government to increase its spending on education, human development, and employment benefits, to name a few (Lammers et al., 2018). In this case, governments have the option of increasing their social expenditure, which, if not managed appropriately, may lead to an increase in debt. While the efficiency theory and the compensation theory are naturally in competition with each other, they both have the ability to explain why the public debt of economies increases on account of globalisation.

1.2. Economic globalisation and public debt in the South African context

In relation to these theoretical arguments, the nature of the relationship between economic globalisation and public debt in South Africa has proven to be more complex. Characterised by its controversial past in the form of the apartheid regime, South Africa has shown an idiosyncratic, internally driven economic integration, unlike other countries where integration was externally imposed through structural adjustment programmes (de Jongh, 2020). Following the rise of democracy in 1994, several policies that reinforced integration into the global economy were implemented by the South African government (Ijeoma, 2008), whereby globalisation reflected a growing interdependence caused by an increase in the international trade of products and services, technologies, the flow of information, investment, and people (Salahuddin et al., 2020). Naturally, this has left the small open economy of South Africa susceptible to external shocks that have brought about both positive and negative effects on the economy.

To be sure, the country has enjoyed the fruits of globalisation. Knowledge transfers have enabled South Africa and other developing nations to improve the standard of living by "leapfrogging" to new technologies (Rodrik, 2018), and through an increase in the demand for South African commodities and natural resources due to incomes rising around the world (Okonjo-lweala and Coulibaly, 2019). In some way, this has mirrored the benefits reaped by East and Southeast Asian economies. Though Asian economies also benefitted from lasting wage increases, poverty alleviation, and expanded trade (Nabi, 2016), this is not to say that there have not been any disadvantages associated with integration and interdependence on the socioeconomic environment of countries.

Studies that provide evidence from developing economies tend to show that globalisation has also caused increases in levels of poverty, unemployment, and inequality, which have inevitably affected their social policies and fiscal budgets (Ukpere and Slabbert, 2009; Awad, 2019). Ukpere (2011) asserts that in the era of global integration, there have been issues of job losses, intense global competition, labour immobility, and wage reductions, while the technological displacement of workers has increased the global unemployment rate, the repercussions of which have been high levels of poverty and inequality in Africa.

Against this backdrop, South Africa's socioeconomic environment seems to have consistently deteriorated over the last 18 years despite efforts made by the government to provide a secure social safety net. While unemployment continues to rise, South Africa remains the most unequal country in the world, with a Gini coefficient of 63% (World Bank, 2023). To date, social assistance provided by the government has managed to keep this figure from growing further (Leibbrandt and Shipp, 2019). Furthermore, poverty patterns remain dismal and skewed by gender and race (Marais, 2018). Stats SA (2019) maintains that adult females and males endure a 52.0% and 46.1% headcount, respectively, when using the upper-bound poverty line headcount by sex. Meanwhile, the most recent national budget shows R5.2 billion in tax relief in support of economic recovery, while the largest portion of the budget goes to social spending followed by debt service costs (National Treasury, 2023). Indeed, debt accumulation has been a typical feature of developing countries with open capital markets that are characterised by issues of deficient resources and moderate savings that have to be fulfilled through some form of external capital (IMF, 2003). The public finances of South Africa remain in a perilous state due to low or nonexistent economic growth, the mediocre performance of SOEs, low tax revenue collection, and the rapidly rising debt levels that are now at their peak in the post-apartheid era (Muller, 2019). By 1994, the country's public debt had dramatically increased from 32% of GDP in 1990 to an average of 44.8% of GDP (World Bank, 2023). According to the Debt Management Report (National Treasury, 2021), the gross debt stock of the country is expected to escalate from R4.35 trillion in 2021/22 to R5.43 trillion in 2024/25, even though a large percentage of the budget goes towards debt repayments. Debt levels and social expenditure by the government have increased concurrently while tax rates have remained stagnant.

1.3. Empirical review

Bearing in mind these ambiguities, the relationship between globalisation and public debt has been investigated in various studies. Some have reported a positive link between globalisation and public debt, while others have found that globalisation either lowers government debt or does not affect it at all. For example, a study by Kim et al. (2018) used panel heterogeneous cointegration techniques for 53 developing and developed countries from 1980 to 2011 and found that government debt increased with financial and trade openness on average. This study also utilised KOF indices and showed that the efficiency hypothesis is predominant. Also looking at a combination of high-income and middle-income countries over the periods from 1993 to 2008 and 1980 to 2008, respectively, Sinha et al. (2011) used panel regressions and found that the public debt of middle-income countries decreased with FDI, whereas FDI did not influence the public debt of high-income countries. Swamy (2020) investigated the macroeconomic determinants of government debt for 252 countries encompassing the BRICS countries, OECD countries, high-income economies (HIC), the least developed countries

(LDC), middle-income economies (MIC), low-income economies (LIC), and heavily indebted poor countries (HPC). The author used data spanning from 1980 to 2009 and the generalised method of moments (GMM) approach, finding that trade openness increased government debt while FDI decreased it.

Some studies have focused on developing countries. In an attempt to determine whether external debt influences trade liberalisation in Pakistan, Zafar et al. (2008) employed secondary data from 1972 to 2007 using an ARDL modelling approach. The results showed a significant long-run positive relationship. Additionally, using FDIs and trade openness as proxies for globalisation and economic globalisation as a control variable, Çolak and Özkaya (2020) studied the influence of military spending on the government's external debt from 1997 to 2016 from some transition economies by using a fixed-effect panel threshold regression model. The authors found that the economic globalisation variable increased the external debt of some transition economies. Kim (2003) used data from 54 industrial and developing countries from 1950 to 1989, 20 OECD countries from 1950 to 1994, and OECD countries from 1951 to 1990 to determine whether capital account liberalisation disciplined the budget deficit. The study found that capital account liberalisation disciplined budget deficits, consequently decreasing government debt. Meanwhile, Combes and Saadi-Sedik (2006) used a GMM-system estimator and focused on 66 developing countries from 1974 to 1998 to determine whether trade openness affects budget deficits. They concluded that trade openness would lead to higher budget deficits and an accumulation of more central government debt.

Moreover, some authors have attempted to investigate this relationship in African economies. Utilising data from 1980 to 2017 on sub-Saharan African countries, Bataka (2021) conducted one of the first studies to focus on the continent, empirically investigating how economic globalisation affects public debt. Differentiating among the KOF globalisation indices, the author used secondary panel data tests and found that financial globalisation increases public debt in the short and long run, but trade globalisation boosts public debt in the short run and lowers it in the long run.

2. Methodology

2.1. Empirical study and data sources

The main objective of this study was to analyse the impact of economic globalisation on public debt levels in South Africa. To achieve this, a quantitative research design and a functional research philosophy were adopted. Secondary time-series data from 1980 to 2020 was utilised. The selected time period was chosen based on data availability and allowed for more accurate results considering the start of the country's integration process only began in the early 1990s when the apartheid sanctions were being lifted. A total of 41 annual observations were included with data sourced from the World Bank Development Indicators (World Bank, 2023), the South African Reserve Bank (SARB, 2023), and the KOF Swiss Economic Institute (KOF Swiss Economic Institute, 2023). The variables under consideration are shown in Table 1 below and included central government debt (as a percentage of GDP) as the dependent variable in the model.

Table 1. Description of variables and data sources

Variable	Measure	Database
Public debt (DEBT)	Gross national government debt total (% of GDP)	SARB (2023)
Economic globalisation (EGL)	Composite KOF economic globalisation index ranging from 0 to 100. The index is based on levels of trade and financial globalisation. A high score indicates a higher level of economic globalisation.	KOF Swiss Economic Institute (2023)
Inflation (INF)	Consumer price index (CPI annual %)	SARB (2023)
Government expenditure (GEP)	General government final consumption expenditure (% of GDP)	World Bank (2023)
Gross domestic product per capita (GDP)	Real GDP per capita (in constant prices, US$ PPP)	World Bank (2023)

Source: own elaboration

To capture the levels of the key explanatory variable, i.e. economic globalisation, the study used an overall (a combination of the de jure and de facto) economic globalisation sub-index developed by the KOF Swiss Economic Institute. Additionally, inflation (consumer price index), government expenditure (as a percentage of GDP) and real GDP per capita were used as control variables. These variables were selected based on their inclusion in similar studies (Swamy, 2020; Bataka, 2021) as well as their established theoretical importance in affecting public debt levels (Zafar and Butt, 2008; Sener et al., 2015). Prior to their inclusion in the modelling, all the variables were transformed to their natural logarithms to ensure consistency of measurement and avoid the possibility of heteroscedasticity.

2.2. Econometric method of analysis and model specification

To carry out the analysis, the study first provides a descriptive overview of the included variables. Thereafter, various econometric techniques were used to analyse the relationships. This included the use of the Zivot–Andrews (1992) unit root test, employed with the goal of testing the stationarity properties of the data. As opposed to conventional unit root tests such as the augmented Dickey–Fuller (ADF) unit root test and Phillips–Peron (PP) tests, this particular unit root test was employed based on its ability to provide more robust results in the presence of possible structural breaks (Fahmi et al., 2019). Based on South Africa's past and the country's significant political and structural changes since its transition to democracy, the use of this particular test provides the opportunity to avoid any inefficiency and bias in the determination of the data's stationarity properties. Consequently, the analysis benefits in the sense of ensuring a more accurate selection in the estimation technique. From this, the equation for the test can be provided as follows:

$$\Delta y_t = \rho + \rho y_{t-1} + \sigma t + \theta DU_t + \sum_{j=1}^{k} d_t \Delta y_{t-j} + \mu_t \quad (1)$$

$$\Delta y_t = \rho + \rho y_{t-1} + \sigma t + \pi DT_t + \sum_{j=1}^{k} d_t \Delta y_{t-j} + \mu_t \quad (2)$$

$$\Delta y_t = \beta + \beta y_{t-1} + \beta t + \tau DU_t + \tau DT_t + \sum_{j=1}^{k} d_t \Delta y_{t-j} + \mu_t \quad (3)$$

where DU_t is indicative of the dummy variable, a particular shift arises at a point *t,* and DT_t indicates the trend in shift. As such:

$$DU_t = \begin{cases} 1 \ldots . if\ t > TB \\ 0 \ldots . if\ t < TB \end{cases} \text{ and } DT_t \begin{cases} t - TB \ldots . if\ t > TB \\ 0 \ldots \ldots \ldots \ldots if\ t < TB \end{cases} \quad (4)$$

Subsequent to these tests, if unit root analyses confirm the stationarity of the variables, all as integrated at first order, this would suggest the possibility of cointegration of the variables. For the purposes of determining possible cointegration, the analysis made use of the Bayer–Hanck (2013) combined test for cointegration. Compared to other cointegration tests, this method overcomes the shortcomings of conventional cointegration testing by avoiding the use of unrelated multiple tests. Moreover, by integrating various test statistics, including those developed by Engel and Granger (1987), Johansen (1991), Boswijk (1995), and Banerjee et al. (1998), it provides a more comprehensive and efficient procedure. In doing so, the test makes use of a Fisher-type formula to construct the equation for the BH test, expressed in the following manner:

$$EG - JOH = -2\left[\ln\left(P_{EG}\right) + \ln\left(P_{JOH}\right)\right] \quad (5)$$

$$EG - JOH - BO - BDM = -2\left[\ln\left(P_{EG}\right) + \ln\left(P_{JOH}\right) + \ln(P_{BO}) + \ln(P_{BDM})\right] \quad (6)$$

where P_{EG}, P_{JOH}, P_{BO} and P_{BDM} are indicative of the test probabilities of the Engel and Granger (1987), Johanssen (1991), Boswijk (1995), and Banerjee et al. (1998) tests, respectively.

In an effort to estimate the elasticity coefficients between the variables and the impact of economic globalisation and public debt, three separate estimation techniques were utilised. These included the fully modified ordinary least squares (FMOLS) (Phillips and Hansen, 1990), dynamic ordinary least squares (DOLS) (Saikkonen, 1992) and canonical cointegration regression (CCR) techniques (Park, 1992). The use of these tests was based on several factors. Firstly, employing multiple estimation techniques would assist in ensuring the robustness of the results. Secondly, each test provided various advantages towards

overcoming possible shortcomings in the estimation of the model. For example, the utilisation of both the FMOLS and DOLS estimation techniques has the ability to accommodate nuisance parameters (Adusei, 1990; Yildirim and Orman, 2018). This assists in overcoming possible estimation bias and endogeneity as well as serial correlation. The former likewise makes use of both leads and lags, avoiding the influence of small sample bias and simultaneity. In addition to this, the use of CCR estimation, as with the FMOLS method, transmutes the data, and uniquely, so too the parameters, providing a more accurate estimation by mitigating the problem of omitted variable bias (Wu *et al.,* 2018). Therefore, based on these estimation techniques, the following model was specified:

$$LDEBT_t = \beta_0 + \beta_1 LECG_t + \beta_2 LGEP_t + \beta_3 INF_t + \beta_4 LGDP_T + \varepsilon_T \qquad (7)$$

where LDEBT refers to the natural logarithm of public debt levels, LECG the natural logarithm of economic globalisation, LGEP the natural logarithm of levels of government expenditure and both LINF and LGDP the natural logarithms of inflation and GDP per capita, respectively. The latter three variables served as control variables in the estimation. Moreover, β_1, β_2, β_3 and β_4 represent the coefficients of the included explanatory variables, while ε_t is indicative of the error term. Finally, given the possibility of cointegration of the variables, causality analysis was undertaken by means of the Toda–Yamamoto Granger causality test (Toda and Yamamoto, 1995). This technique provides the ability to accommodate different orders of integration, specifically when variables are either stationary at level or first difference. In the analysis of causal relationships, it makes use of a modified Wald test providing robust results by overcoming possible problems associated with conventional causality methods, including the influence of both power and size (Rahman et al., 2015).

3. Empirical results and discussion

3.1. Descriptive analysis

As a first step in the analysis, the study presents a synopsis of the attributes of each of the variables that are included. This descriptive insight is presented in Table 2. Prominent among these results, firstly, are the mean values of the included variables for the past four decades. Here, average scores for the CPI index, government expenditure (as a percentage of GDP) and the GDP per capita level (constant prices in dollars) were all calculated at 37.35, 24.01% and US$12,180.36, respectively. As for the main variables under consideration, the mean values for government debt levels suggest that on average government debt has been approximately estimated at 34.47% of GDP over the last 40 years. While this might seem on a par with similar developing regions, the recent sharp rises have been concerning. This is shown by the maximum value for the period under consideration, estimated at 57.20% in 2020. Considering the results for the economic globalisation index, the median has been slightly higher than the mean, suggesting a slight leftward distribution. On average, levels of economic globalisation have been below the 50-mark threshold. This can be explained by the country's unique integration path. Considering the imposition of various racial segregation policies prior to the early 1990s and the subsequent economic sanctions, the country only started to meaningfully integrate economically with the transition to democracy after this period. The minimum value of 28.98 here was recorded in 1989, while the maximum value of 56.57 was attained in 2016, showcasing the progress the country has made.

Table 2. Descriptive statistics

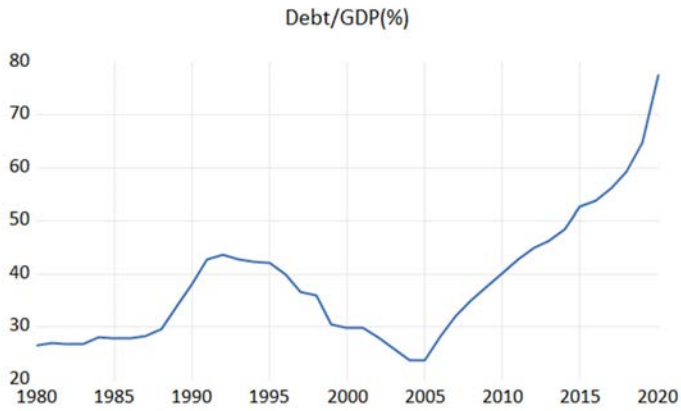
Statistic / variable	DEBT/GDP (%)	KOFECG	CPI	GEP	GDP
Mean	34.475	44.867	37.347	24.014	12,180.860
Median	31.900	51.317	31.992	24.000	11,991.110
Maximum	57.200	56.571	93.292	29.700	14,049.390
Minimum	23.600	28.820	3.475	17.665	10,256.750
Std. Dev.	8.410	10.139	27.218	2.496	1289.839
Skewness	0.743	-0.219	0.539	-0.180	0.157
Kurtosis	2.671	1.282	2.130	2.963	1.563
Jarque-Bera	3.961	3.371	3.283	0.229	3.692
Probability	0.137	0.168	0.193	0.891	0.157
Observations	41	41	41	41	41

Source: own elaboration

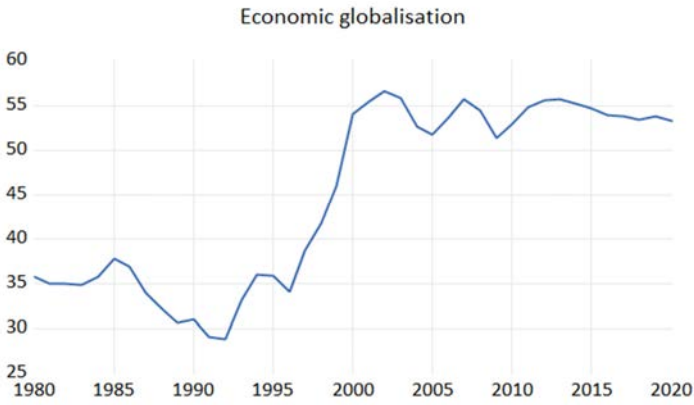
In addition to these insights, the Jarque-Bera statistics for all the variables suggest a normal distribution with all p-values estimated above the 0.1 threshold. Moreover, upon review of the standard deviations, when compared to the mean values, these were relatively small, apart from those for the CPI figures. This would suggest that most of the variables were well represented by their average scores. Additionally, it also shows a degree of lower volatility.

On the basis of these dynamics, it was also deemed critical to provide an understanding of the trends in the selected variables. In this respect, Figure 1(a-e) provides an overview of the changes in the five variables under consideration. Of these, arguably the most striking feature has been the excessive increase in debt-to-GDP ratios South Africa has seen over the last 15 years, the estimated levels of which increased from just above 20% to close to 80% of the country's economy. These continuously increased levels were also replicated considering the levels of economic globalisation of the country. However, upon reflection on the timeframes, these increases coincided with the end of the apartheid regime in the early 1990s and the adoption of more neoliberal economic policies, affording the country a notable gateway into the global economic network. Whilst these increases lasted for at least 10 years, economic integration levels notably stagnated after the early 2000s.

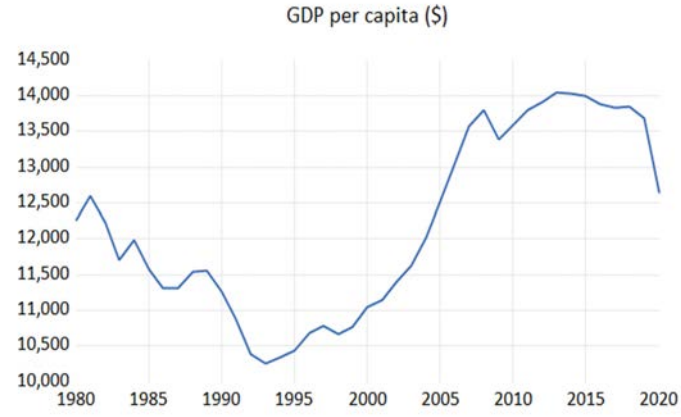
Figure 1 (a-e). Trends in the selected variables (1980–2020)



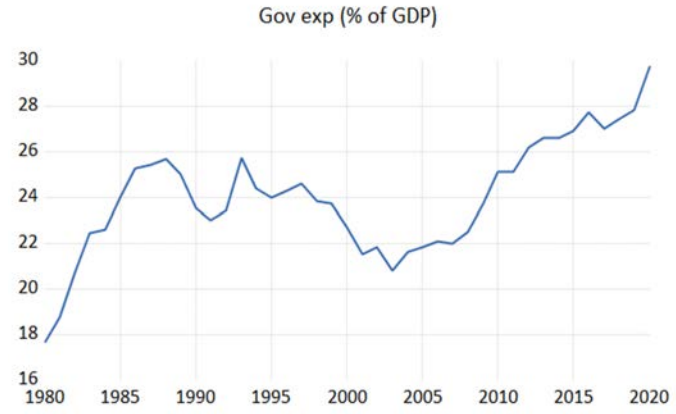
(a)



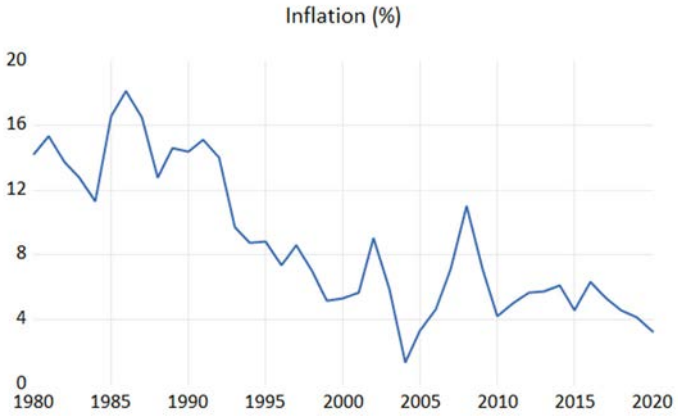
(b)



(c)



(d)



(e)

Source: own elaboration

Whilst the focus on these two variables alludes to interesting dynamics, so too do the included trends for the control variables. Considering the important role played by economic growth attributes within the nexus, the trends from Figure 1(c) allude to two tales. The first is particularly evident in the decreasing economic output from 1980 to the early 1990s, when, amongst other factors, the country faced significant economic sanctions, whilst likewise adopting import substitution industrialisation (ISI) policies that afforded little advantage to the levels of innovation. Nonetheless, after the advent of democratic rule, progress in this respect seemed much more positive with the influx of many new labour market participants and a concentrated effort to move away from the inherited economic structure. Concerningly, much like the country's endeavour to integrate meaningfully, it seems to have fallen into a middle-income growth trap, with income levels stagnating and even deteriorating over the last 12 years.

Finally, considering the trends in both levels of expenditure and inflation, both Figure 1(d) and (e), respectively, afford insight into other factors concerning levels of price stability and spending patterns from officials. The latter points to a notable driver of increasing debt levels for national treasury. Substantial increases relative

to the size of the economy have occurred since the early 2000s. In contrast, however, average increases in prices have subsided significantly over the course of the past four decades, which is most probably strongly related to the adoption of a more sound monetary policy regime at the turn of the century.

3.2. Correlation analysis

Upon completion of the descriptive analysis, the study proceeded to determine the associations between the variables under consideration. Whilst this affords some understanding of how changes in one variable are correlated with those in another, so too does it provide notable insight into the possible presence of collinearity between the independent variables. Relating to the former, results for the correlation analysis as shown in Table 3 provide evidence of positive and statistically significant (at least at the 5% level) correlations between LGDP and LDEBT, LGEP and LDEBT, LGDP and LGEP, and LECG and LGDP.

Table 3. Correlation analysis

Probability	LDEBT	LGDP	LGEP	LINF	LECG
LDEBT	1.000 -----				
LGDP	0.396** (0.010)	1.000 -----			
LGEP	0.706*** (0.000)	0.308** (0.049)	1.000 -----		
LINF	-0.394** (0.010)	-0.424*** (0.005)	-0.305* (0.052)	1.000 -----	
LECG	0.280* (0.075)	0.687*** (0.000)	0.219 (0.168)	-0.697*** (0.000)	1.000 -----

Note: *** indicates significance at the 1% level of significance, ** at the 5% level of significance, * at the 10% level of significance.

Source: own elaboration

In contrast to these dynamics, three relationships were found to be inversely correlated. Here LINF and LDEBT, LINF and LGDP, and LECG and LINF all exhibited statistically significant (at least at the 5% level) negative correlation coefficients. In addition to this, none of the correlation coefficients were estimated higher than the suggested threshold, implying no initial signs of multicollinearity between the regressors (Belinda and Peat, 2014).

3.3. Unit root analysis

Following the descriptive analysis, the study sought to determine the order of integration of the variables by using the ZA unit root test and checking whether the variables were indeed integrated at I(1). Additionally, it helped to identify whether there might be any variable that might possibly be integrated at the second order of integration, since these would influence the use of specific causality analysis. Table 4 below depicts the results thereof, distinguishing between

those properties with only intercept and those with intercept and trend with a single structural break. Among the five variables included, the test confirmed that in both cases, as mentioned above, at level, all variables attribute to the unit root. However, at first difference, these variables were stationary.

Table 4. Zivot–Andrews unit root test results

Variable	Intercept	Break year	Intercept and trend	Break year	Stationary
LDEBT	-3.454	1998	-2.856	2003	No
LECG	-4.838	1997	-2.464	2007	No
LGEP	-3.795	2009	-4.667	2005	No
LINF	-3.179	1989	-3.329	1992	No
LGDP	-3.480	2004	-1.919	2014	No
ΔLDEBT	-7.776***	2003	-6.789***	1988	Yes
ΔLECG	-5.192**	1993	-4.388*	1998	Yes
ΔLGEP	-5.804***	1987	-6.242***	1990	Yes
ΔLINF	-4.484	1993	-5.329***	2000	Yes
ΔLGDP	-4.218	1994	-5.172***	2007	Yes

Note: *** indicates significance at the 1% level of significance, ** at the 5% level of significance, * at the 10% level of significance.

Source: own elaboration

3.3. Bayer–Hanck results for cointegration

In light of the properties identified in the previous section, the analysis ensued with the testing of the long-run relationship between the variables using the BH cointegration technique. The results, as shown in Table 5 below, show that the calculated F-statistics for both the combined EG-J test (F-Stat = 11.962) and the EG-J-Ba-Bo test (F-Stat. = 39.313) exceeded the critical values at a 5% level of significance.

Table 5. Bayer–Hanck combined cointegration results

Model	Bayer–Hanck test	F-statistic	Critical value (5%)	Cointegration
LDEBT = f (LECG, LGEP, LINF, LGDP)	EG-J type test	11.962**	10.576	Yes
	EG-J-Ba-Bo test	39.313**	20.143	Yes

Note: ** indicates significance at the 5% level of significance.

Source: own elaboration

The results from Table 5 therefore confirmed the rejection of the null hypothesis of no cointegration between the variables under consideration. From this perspective, it would suggest significant long-run associations and meaningful effects between economic globalisation and public debt levels in South Africa for all the variables included in the study.

3.4. Regression results

Subsequent to the confirmation of the long-run relationships, the analysis ensued by estimating the elasticity of the relationships between each of the independent variables and the country's public debt. Here three different estimation techniques were employed, namely FMOLS, DOLS and CCR. The results from these estimations are shown in Table 6 with most being congruent to the others, with few exceptions. Among the estimations shown, economic globalisation has a significant and positive impact on rising fiscal debt in the country. Here, all three models show a positive and significant (at the 1% level of significance) influence, corroborating the idea that the manner in which the country has integrated into the global economy has contributed to sustained increases in the level of fiscal debt policymakers have incurred. Elasticity coefficients, in this regard, range from a minimum of 0.500 to 0.749, suggesting that a 1% increase in levels of economic globalisation would suggest increases ranging from 0.5% to 0.749% in the government debt levels of the country, ceteris paribus. The results in this respect support the findings of Bataka (2021) and those of Combes and Saadi-Sedik (2006), who also found that economic globalisation, or at least proxies for the process, have a positive influence on central government debt levels.

While these findings are unable to definitively state whether the compensation or efficiency hypothesis holds in this scenario, considering that corporate tax rates have remained marginally higher in South Africa (28%) compared to other developing areas around the globe (OECD average = 23.05; Asian average = 21.13; South American average = 27.36) (KPMG, 2023), and while the labour market has been consistently characterised as notably rigid (Loewald et al., 2021), it would appear that these findings do lend support to the former. In this respect, probable causes of the pressure that integration has brought with it to the fiscal budget can be explained on various fronts. Empirical evidence in this regard has pointed to the increased need for higher social protection from the state in order to account for the associated risks and protection of the social environment brought on by the induced volatility in economic conditions, as well as financial and social crises (Bergh, 2021). Within this context, the skill-biased technological changes and intensified demand directed towards high-value-added service sectors through both foreign trade and financial capital flows seem to have exacerbated the country's problems of a large surplus of a low-skilled workforce and a lack of economic diversification (World Bank, 2022). This has consequently increased the social challenges of unemployment, poverty, and inequality. In this respect, levels of government debt have been driven by changing the composition of spending away from capital-oriented foci towards social expenditure that prioritises transfers and subsidies, all with the purpose of mitigating the social impact of these challenges.

Table 6. Regression results of FMOLS, DOLS and CCR estimation

Variable	FMOLS			DOLS			CCR		
	Coeff.	*t-stat. (Prob.)*	*Cen. VIF*	*Coeff.*	*t-stat. (Prob.)*	*Cen. VIF*	*Coeff.*	*t-stat. (Prob.)*	*Cen. VIF*
LECG	0.749	[8.087] (0.000***)	4.971	0.677	[7.800] (0.000***)	4.120	0.500	[7.387] (0.000***)	3.971
LGEP	-0.170	[-0.729] (0.471)	2.446	0.724	[2.521] (0.019**)	2.240	0.474	[1.651] (0.107)	2.446
LINF	0.624	[16.780] (0.000***)	1.249	0.433	[6.868] (0.000***)	1.296	0.526	[10.733] (0.000***)	1.249
LGDP	-0.769	[-2.230] (0.032**)	3.178	-1.039	[-0.990] (0.333)	3.645	0.753	[1.167] (0.251)	3.178
C	3.408	[1.309] (0.198)	------	-1.317	[-0.359] (0.722)	------	-7.686	[-3.421] (0.001***)	------
R^2		0.923			0.905			0.932	
Adjusted R^2		0.910			0.892			0.930	

Note: **** shows the significance at 1% level and ** significance at the 5% level; [ ] shows the t-stats.; ( ) shows the p-values; estimated centred VIF values for all independent variables across the three estimations between 1.249 and 4.971 all below the 5 point threshold (Menard, 2001), indicating no serious presence of collinearity.

Source: own elaboration

While these examples can suggest the indirect nature of debt levels, other more direct considerations should also be acknowledged. In turn, the increased trade liberalisation of the South African economy and its selection of major trading partners could have contributed to decreased customs revenue. Moreover, from a financial point of view, Asongu and Nnanna (2020) state that higher levels of political instability and corruption also induce the probability of significant levels of capital flight. This comes on the basis of investors shying away from economic environments where disrespect for the rule of law is systemic. Financial liberalisation in the face of higher levels of economic globalisation in this respect has increased the elasticity of capital flows for such governance risks. The loss of valuable financial resources in this respect poses considerable problems in terms of possible tax revenue that is foregone (Fisseha, 2022). In both these instances, government debt levels can be aggravated not so much by invoking induced spending to relieve social pressure, but rather restricting the capability of fiscal policy to garnish sufficient levels of revenue. This might definitely be considered a plausible cause within the South African context, with the country grappling with high levels of corruption involving the political elite, the private sector, and more recently other prominent international financial networks (Ndikumana et al., 2020).

In relation to the main findings, estimates for inflation confirm a significant (at the 1% level of significance) and positive relationship with public debt levels, confirmed across all three different estimation procedures. Here, coefficients shown for the LINF variable in Table 6 range from 0.433 to 0.624. This would indicate that a 1% increase in the inflation rate would cause an increase in the real value of public debt by between 0.433% and 0.624%. This finding is intriguing as it contrasts with those of Fukunaga et al. (2022) and Manalo et al. (2022). While these studies suggest that price pressures erode the value of debt obligations by transferring the burden from the borrower to the lender, this does not seem to hold in the South African case. Rather, findings here must be considered in the context of the long-term nature of the analysis. As Neely (2022) states, considering the temporal nature of the dynamics between inflationary pressures and government debt levels, while mounting price pressures can reduce the value of debt in the actual term, on the basis of expectations of future higher inflation, inflation induces higher interest demands from bond holders. In this respect, real debt stock levels are set to increase as interest payments become more expensive in the long term.

Furthermore, upon reviewing the relationships between the dependent variable and the remaining control variables, the estimates of government expenditure and GDP per capita seem to validate the expected relationship. In this case, government expenditure in two of the three estimations shows a positive relationship with public debt. However, only in the DOLS estimation does it seem to exhibit a statistically significant (at the 5% level of significance) impact. These findings support the aforementioned insights in which debt is believed to be aggravated through the pressure and need for greater social assistance (Rodrik, 1998; Dreher et al., 2008) as the country has integrated, pointing to more unproductive spending objectives. The implications from this perspective, especially within the context of a globalised South African economy, are significant. Given that economic globalisation has driven social expenditure, it implies that government spending directed towards enabling capital investment has been restricted. This could have significant adverse consequences in a number of realms pertaining to the attraction of much-needed FDI, job creation and the ability of government to enable investment and asset formation, all which have the ability to stimulate future additional revenue streams and economic growth. Again, this points to the long-run consequences of adverse global integration. While social spending in the short run mitigates adverse external shocks, a widening budget deficit constrains the ability of the public sector to provide an enabling environment through its other spending objectives (investment in school infrastructure, public transport, renewable energy, healthcare, etc.).

Finally, the results from Table 6 also provide an insight into the relationship between the natural logarithm of economic growth (GDP per capita) levels and the logarithm of levels of public debt. As the last control variable added to the model, the results would be expected to show a negative relationship between these estimates (Van Cauwenbergh and Laleman, 2018). This a priori supposition derives its logic from both sides of the revenue and spending spectrums of levels of government debt. On the one hand, greater levels of income are believed to induce less pressure (required social expenditure) on fiscal policy to provide a more egalitarian social environment (Pettinger, 2019). On the other hand, greater levels of income, based on consumer spending (C), higher levels of infrastructure development (I), and export performance (X), would suggest greater levels of tax revenue on the basis of the Keynesian framework (Ayenew, 2016). The results here, much like those for levels of

government expenditure, are somewhat inconclusive. From the three models estimated, two (FMOLS, DOLS) support the a priori result, with the FMOLS estimation suggesting a statistically significant (at the 5% significance level) impact of GDP per capita levels on public debt levels. The coefficient from the model in fact infers that a 1% increase in income levels would reduce public debt levels by approximately 0.77%. Similar findings have also been found by Mothibi and Mncayi (2019) and Swamy (2020). From this finding, the analysis showcases just how important it is to ensure that fiscal objectives, especially when budget deficits and spending are considered, should be directed towards optimising the capacity of the economy for growth. While social expenditure directed towards alleviating problems such as poverty and inequality is crucial, governments must understand the sustainable impact that the creation of an inclusive and expanding economic structure has through increasing levels of infrastructure.

3.5. Toda–Yamamoto Granger causality analysis

Following the regression analysis, the Toda–Yamamoto Granger causality analysis was performed. This was done after confirming co-integration relationships that implied the potential of underlying causal effects (Granger, 1988). Insights from this type of analysis are especially noteworthy for policymakers. Understanding the causal effects would allow for better comprehension and strategic action in the globalisation–debt nexus. The results of the analysis are provided in Table 7 below. It can be concluded that there is a unidirectional relationship between economic globalisation and public debt; that is, causality runs from economic globalisation to public debt, suggesting that changes in government debt levels are consequential to changes in the levels of economic globalisation. In fact, the associated p-value of 0.000 is indicative of the rejection of the null hypothesis (no causality) at the 1% significance level. In this respect, the findings confirm that the manner in which the country has integrated has increased its susceptibility, at least considering its fiscal finances, to external economic shocks. This can possibly be explained by its dependence on a narrow range of export commodities (Signé and Johnson, 2021) and a deterioration in institutional strength to adequately mitigate the associated effects of these shocks (Thakoor, 2020).

In addition to these findings, the results shown in Table 7 also suggest the presence of a causal relationship that runs from levels of public debt to government expenditure. The statistically significant (at a 10% significance level) and unidirectional nature links well with the regression results. For example, given the significant positive impact of expenditure on debt levels, the causal link here can be explained based on the constraining effects of high and rising debt levels, particularly towards stimulating investment. As Jeločnik et al. (2016) explain, with higher debt levels, invoked partly by higher levels of integration, the government is required to direct a large portion of its budget to debt servicing costs. In the South African case, this has meant that fiscal policy has been limited in its ability to pursue notable investment spending. This has indeed been true, with the SARB (2021:1) reporting that debt service costs have been the fastest growing expenditure category over the last decade. In fact, these costs as a percentage of total government expenditure have more than doubled since the onset of the global financial crisis (GFC) of 2007-2008, increasing from 8.9% in 2008 to 18% in 2023 (National Treasury, 2023).

Table 7. Toda–Yamamoto Granger causality results

Variable	Dependent variable				
	LDEBT	**LECG**	**LGEP**	**LCPI**	**LGDP**
LDEBT	------	0.012 (0.993)	5.646 (0.059*)	1.981 (0.371)	4.123 (0.127)
LECG	16.480 (0.000***)	------	4.484 (0.106)	1.569 (0.456)	2.455 (0.293)
LGEP	1.924 (0.382)	0.605 (0.739)	------	2.018 (0.364)	5.141 (0.076*)
LCPI	2.584 (0.274)	5.035 (0.081*)	0.916 (0.632)	------	0.381 (0.826)
LGDP	0.736 (0.692)	2.713 (0.257)	0.321 (0.851)	8.747 (0.012**)	------

Note: *** indicates significance at the 1% level of significance, ** at the 5% level of significance, * at the 10% level of significance.

Source: own elaboration

Further results from Table 7, as with those in the tables above, signify two statistically significant unidirectional relationships. These include those emanating from levels of economic growth to inflation (significant at the 5% level of significance), as well as government expenditure to levels of growth (significant at 10% level of significance). The former is testament to the notion that changes in higher price levels are concomitant to changes in growth within the frameworks of countries considered to still be largely intertwined in the developing process (Di Pietro and Sawhney, 1999). The latter, however, confirms that over the last four decades, changes in government expenditure have brought about changes in GDP per capita levels. For this, again, the results speak to just how noteworthy it is for fiscal spending to be directed prudently, focusing more on expanding key social infrastructure and industrial sectors of the economy, especially within the South African context. As Barro (1990) reiterates, these represent important contributions not only to a more stable and financially capable fiscal policy (reducing the fiscal deficits), but also higher levels of labour productivity and employment.

Conclusion and recommendations

In both the theoretical review and empirical analysis, the study has shown just how noteworthy the influence of connected and integrated economic processes is. Globalisation from this point of view has arguably been among the most influential occurrences of modern life. On the one hand, the processes, specifically from an economic perspective, have afforded countries various advantages, among which are significant influxes of FDI, the formation of key trade partnerships and the knowledge spillovers and technological innovation that have accompanied these flows. This insight has also shown that the process, in certain circumstances, has afforded fiscal policymakers the potential to act as meaningful and enabling role players in their social environments. On the one hand, this comes from the supplementary foreign injections that have offered additional revenue streams, affording governments the financial capability to invest in

key infrastructural and social areas such as education, healthcare, and wider industrial projects. Likewise, based on the manner in which countries have integrated economically, especially considering the East Asian case, globalisation presents an opportunity to improve social environments (by spurring industrialisation, lowering unemployment levels, and creating inclusive growth environments), consequently reducing the need for greater social assistance and fiscal financial pressure.

Despite this overarching positive potential, the study has shown that the nexus between economic globalisation and public finances is a much more complex phenomenon. The findings in this regard point to various significant considerations. Among the first of these lies the fact that the manner in which economic globalisation affects public debt is not only dependent on external forces, but also on the endogenous environments of economies. The South African case, from this perspective, provided an intricate event. The results in this respect pointed to the fact that the economy's unique integration process has largely aggravated its debt levels. This has several possible causes, including aspects relating to its positioning in world systems as a small middle-income economy struggling to position itself far from the periphery of global economic processes. Lacklustre positions in GVCs, the lack of sufficient economic diversification and the formation of foreign trade and financial relationships, at least qualitatively, have not contributed to more enabling social environments in any meaningful sense. More so, it has remained particularly susceptible to external economic shocks, all of which have imposed serious pressure on fiscal policymakers. So too has the country's domestic environment, with large surpluses of low-skilled labour, significantly high levels of poverty and ever-increasing levels of corruption, posed noteworthy concerns considering the skill-biased technological nature of global economic processes as well as the mobility of capital in an increasingly competitive financial system.

All of these dynamics have posed noteworthy implications for fiscal policymakers and the country's fiscal budget As public debt levels continue to rise, it has largely restricted their ability to act as a meaningful role player not only in alleviating social pressures in the short term, but more importantly providing the required capital stimulus to create a more inclusive economy – one that could also be better equipped to take advantage of the benefits that the globalisation process has to offer. Based on this, the study therefore suggests the prioritisation of policies that aim to reduce both the pressure on the revenue and spending sides of the current challenge. For the former, key strategies directed towards the diversification of the economic base, the strengthening of key domestic industries, and the promotion of greater levels of regional partnership formation must be pursued to better position the country in the global economic framework and attract additional revenue streams. Moreover, on the spending side, investment in key infrastructure, human capital development, and fostering an inclusive growth environment should be prioritised. These initiatives, together with sound fiscal accountability and the better management of debt through alternative sources of financing, would all help the country to take better advantage of its economic integration and subsequently improve its fiscal outlook in the long run. While this study afforded notable insight, based on its limitations, future areas of research into this dynamic can also be pursued. This should include the differentiation between the influence of both de jure and de facto globalisation, as well as analyses directed towards further understanding possible non-linear relationships between the variables under consideration.

Moreover, studies could also expand on the role of more regional partnerships, especially within the African context, to better comprehend these dynamics when considering the interconnectedness of similar economic structures.

References

Adusei, M. (2012), Financial development and economic growth: is Schumpeter right? *British Journal of Economics, Management and Trade 2*(1), 265–278.

Al-Rodhan, N.R., Stoudmann, G. (2006), *Definitions of globalization: a comprehensive overview and a proposed definition*, Geneva: Geneva Centre for Security Policy.

Asongu, S.A., Nnanna, J. (2020), Governance and the capital flight trap in Africa, *Transnational Corporations Review*, *12*(3), 276-292. DOI: https://doi.org/10.1080/ 19186444.2020.1771123

Awad, A. (2019), Economic globalisation and youth unemployment: evidence from African countries, *International Economic Journal*, *33*(2), 252-269. DOI:10.1080/10168737.2019.1604787

Azzimont, M., de Francisco, E., Quadrini, V. (2014), Financial globalization, inequality, and the rising public debt, *The American Economic Review*, *104*(8), 2267-2302. DOI:10.1257/aer.104.8.2267

Banerjee, A, Dolado, J., Mestre, R. (1998), Error-correction mechanism tests for cointegration in a single-equation framework, *Journal of Time Series Analysis*, *19*(1), 267–283. DOI:

Barro, R. J. (2013), Health and economic growth, *Annals of Economics and Finance*, *14*(2), 329–366. DOI: https://doi.org/10.1111/1467-9892.00091

Barro, R.J. (1990), Government spending in a simple model of endogenous growth, *Journal of Political Economy*, *98*(5), 103-125. DOI: https://doi.org/10.1086/261726

Bataka, H. (2021), Economic globalization and public debt in Sub-Saharan Africa, *International Journal of Finance & Economics*, 2021, 1-16. DOI: https://doi.org/10.1002/ ijfe.2506

Bayer, C., Hanck, C. (2013), Combining non-cointegration tests, *Journal of Time Series Analysis*, *34*(1), 83-95. DOI: https://doi.org/10.1111/j.1467-9892.2012.00814.x

Belinda, B., Peat, J. (2014). Medical statistics: a guide to SPSS data analysis and critical appraisal. 2nd ed. London: Wiley.

Bergh, A. (2021), The compensation hypothesis revisited and reversed, Scandinavian Political Studies, 44(2), 140-147. DOI: https://doi.org/10.1111/1467-9477.12191

Boswijk, P. (1995), Efficient inference on cointegration parameters in structural error correction models, *Journal of Econometrics*, *69*(1), 133–158. DOI: https://doi.org/10.1016/0304-4076(94)01665-M

Burrie, P., Checherita-Westphal, C., Jacquinot, P. Schön, M., Stähler, N. (2020), *Economic consequences of high public debt: evidence from three large scale DSGE models*, ECB working paper no. 2450, Frankfurt: European Central Bank.

Calitz, E. (2000), *Fiscal implications of the economic globalisation of South Africa, South African Journal of Economics*, *68*(4), 252-269. DOI: https://doi.org/10.1111/j.1813-6982.2000.tb01270.x

Cerna, L. (2013), *The nature of policy change and implementation: a review of different theoretical approaches*, Paris: OECD publishing.

Çolak, O., Özkaya, M. H. (2020), The nexus between external debts and military expenditures for the selected transition economies: a panel threshold regression approach, *Defence and Peace Economics*, *32*(7), 882-898. DOI: https://doi.org/10.1080/10242694.2020.173677 9

Combes, J., Saadi-Sedic, T. (2007), How does trade openness influence budget deficits in developing countries? *The Journal of Development Studies*, *42*(8), 1401-1416. DOI: https://doi.org/10.1080/00220380600930762

Cuervo-Cazurra, Á., Doz, Y., Gaur, A. (2020), Scepticism of globalization and global strategy: increasing regulations and countervailing strategies, *Global Strategy Journal*, *10*(1), 3-31. DOI: https://doi.org/10.1002/gsj.1374

de Jongh, J. (2020), Economic globalisation and government size: testing the compensation hypothesis in South Africa's public sector, *International Journal of Business and Management Studies*, *12*(1), 66-83.

de Jongh, J.J. (2022), How has economic globalisation affected industrialisation in South Africa? Answers from an ARDL approach, Proceedings of the Social Sciences International Research Conference, 18–21 October, 2022, Mauritius. Retrieved from: https://commerce.nwu.ac.za/sites/commerce.nwu.ac.za/files/files/SSIRC/SSIRC-2022-Proceedings-M-2023-ISBN.pdf (accessed: 18 April 2023).

Dreher, A. (2006), Does globalization affect growth? Evidence from a new index of globalization, *Applied Economics*, *38*(10), 1091–1110. DOI: https://doi.org/10.1080/ 00036840500392078

Dreher, A. Gaston, N., Martens, P. (2008), Measuring globalisation: gauging its consequences, New New York: Springer.

Engle, R., Granger, C. (1987). Co-integration and error correction: representation, estimation, and testing, Econometrica: *Journal of the Econometric Society 2*(1), 251–76. DOI: https://doi.org/10.2307/1913236

Fahmi, M.S., Geetha, C., Mohidin, R. (2019), Testing for unit roots and structural breaks in Malaysia unanticipated macroeconomic variables, *Malaysian Journal of Business and Economics (MJBE)*, *6*(2), 1-12. DOI: https://doi.org/10.51200/mjbe.v0i0.2161

Figge, L., Martens, P. (2014), Globalisation continues: the Maastricht globalisation index revisited and updated, *Globalisations*, *11*(6), 875-893. DOI: https://doi.org/10.1080/1474 7731.2014.887389

Fisseha, F.L. (2022), Tax revenue potential and effort in Ethiopia: a comparative analysis of stochastic frontier analysis vs utility maximisation function as a new measure of tax effort, *African Multidisciplinary Tax Journal*, 2022(1), 307-328. DOI: https://hdl.handle.net/10520/ejc-jlc_amtj_v2022_n1_a17

Friedman, T. l. (2000), *The Lexus and the olive tree: understanding globalisation*, New York: Springer.

Fukunaga, I., Komatsuzaki, T., Matsuoka, H. (2022), Inflation and public debt reversals in advanced economies, *Contemporary Economic Policy*, *40*(1), 124-137. DOI: https://doi.org/10.1111/coep.12537

Granger, C.W. (1988), Some recent development in a concept of causality, *Journal of Econometrics*, *39*(1-2), 199-211. DOI: https://doi.org/10.1016/0304-4076(88)90045-0

Gygli, S., Haelg, F., Potrafke, N., Sturm, J. E. (2019), The KOF globalization index: revisited, *The Review of International Organizations*, *14*(3), 543–574. DOI: https://doi.org/ 10.1007/s11558-019-09344-2

Haelg, F. (2020), *The KOF globalization index: a multidimensional approach to globalization. Jahrbücher für Nationalökonomie und Statistik*, *240*(5), 691–696. DOI: https://doi.org/ 10.1515/jbnst-2019-0045

Held, D., McGrew, A., Goldblatt, D., Perraton, J. (1999), *Global transformations: politics, economics and culture*, in: C. Pierson and S. Tormey (Eds.), *Politics at the edge* (pp. 14-28), London: Palgrave Macmillan.

Holtfrerich, C. Feld, L., Heun, W., Illing, G., Kirchgässner,G., Kocka, J., Schularick, M., Streeck, W., Wagschal, U., WalterS., von Weizsäcker, C. C. (2016), *Government debt: causes, effects and limits*, Berlin: Berlin-Brandenburg Academy of Sciences and Humanities.

Ijeoma, E.O.C. (2008), Globalisation and reflective policy: making in South Africa, *Journal of Public Administration*, *43*(3.1), 99-112. DOI: https://hdl.handle.net/10520/EJC51639

IMF (International Monetary Fund), (2002), *Globalization: threat or opportunity?* Retrieved from: https://www.imf.org/external/np/exr/ib/2000/041200to.htm#II (accessed 26 July 2022).

IMF (International Monetary Fund). (2003), *Effects of financial globalization on developing countries: some empirical evidence*, IMF occasional paper no. 220, Washington, D.C.: International Monetary Fund.

IMF (International Monetary Fund). (2023), World economic outlook database. Retrieved from: https://www.imf.org/en/Publications/SPROLLs/world-economic-outlook-databases#sort=%40imfdate%20descending (accessed: 31 March 2023).

Inman, R.P., Rubinfield, R.L. (2013), Understanding the democratic transition in South Africa, *American Law and Economics*, *15*(1), 1-38. DOI: https://doi.org/10.1093/aler/ahs023

Jeločnik, M., Zubovic, J. & Djukic, M. (2016), *Implications of globalization on growing external debt in eight transition economies*, in: M. Jeločnik, J. Zubovic and M. Djukic (Eds.), *Global perspectives on trade integration and economies in transition* (pp.80-104), Pennsylvania: IGI Global.

Jenserud, I. (2018), *Analysing measurements of international transportation costs*, Potchefstroom: North-West University, (Dissertation – MCom).

Johansen, S. (1991), Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models, *Econometrica: Journal of the Econometric Society*, *2*(1), 1551–1580. DOI: https://doi.org/10.2307/2938278

Kaufman, R.R., Segura-Ubiergo, A. (2001), Globalization, domestic politics, and social spending in Latin America: a time-series cross-section analysis, *World Politics*, *53*(4), 553-587. DOI: doi:10.1353/wp.2001.0016

Kim, D., Seun, Y., Lin, S., Hsieh, J. (2018). Government size, government debt and globalization, *Applied Economics*, *50*(52), 2729-2803. DOI: https://doi.org/10.1080/ 00036846.2017.1409418

Kim, W. (2003), *Does capital account liberalization discipline budget deficit?* Review of International Economics, 11(5), 830-844. DOI: https://doi.org/10.1046/j.1467-9396.2003.00420.x

KOF Swiss Economic Institute. (2023), KOF globalisation index, Retreived from: https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html (accessed 1 April 2023).

Kose, M. A., Nagle, P., Ohnsorge, F., Sugawara, N. (2021), *What has been the impact of COVID-19 on debt? Turning a wave into a tsunami*, World Bank working paper no. 99, Washington, D.C.: World Bank Group.

KPMG. (2023), Corporate tax rates table, https://kpmg.com/za/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-ratestable.html#:~:text=In%20general%2 C%20the%20corporation%20tax,-public%20and%20 private%20limited%20companies. Date of access: 12 March 2023.

Lammers, I., van Gerven-Haanpää, M.M., Treib, O. (2018), Efficiency or compensation? The global economic crisis and the development of the European Union's social policy, *Global Social Policy*, *18*(3), 304-322. DOI: https://doi.org/10.1177/1468018118790957

Lane, M. P. R., Milesi-Ferretti, M. G. M. (2000), *External capital structure: theory and evidence*, IMF working paper no.152, Washington, D.C: International Monetary Fund.

Leal, P.H., Marques, A.C., Shahbaz, M. (2021), The role of globalisation, de jure and de facto, on environmental performance: evidence from developing and developed countries, *Environment, Development and Sustainability*, *23*(5), 7412-7431. DOI: https://doi.org/ 10.1007/s10668-020-00923-7

Leibbrandt, M., Shipp, T. (2019), *Reducing inequalities in South Africa: progress on equality thwarted by slow growth and success of top earners*, WIDER policy brief no. 2019/2, Helsinki: UNU-WIDER.

Loewald, C., Makrelov, K., Wörgötter, A. (2021), *Addressing low labour utilisation in South Africa*, SARB working paper no. 21/09, Pretoria: South African Reserve Bank.

Lutkevich, B. (2022), *What is globalisation?* Retrieved from: https://www.techtarget.com/ searchcio/definition/ globalization (accessded 22 April 2023).

Manalo, J.L., Villamiel, M., Cruz, E.D. (2022), Macroeconomic determinants of public debt in the Philippines, *Journal of Economics, Finance and Accounting Studies*, *4*(1), 530-551. DOI: https://doi.org/10.32996/jefas.2022.4.1.40

Marais, H. 2018. *The climate crises: South African and global democratic eco-socialist alternatives*, Johannesburg: University of the Witwatersrand.

Menard, S. (2001). *Applied logistic regression analysis*. 2nd ed. New York: SAGE Publications.

Mikalauskiene, A., Streimikiene, D., Mulagalejeva, K. (2016), Assess the impact of globalisation processes by indices, *Economics & Sociology*, *9*(4), 82-100. DOI: 10.142 54/2071-789X.2016/9-4/5

Mothibi, L., Mncayi, P. (2019), Investigating the key drivers of government debt in South Africa: a post-apartheid analysis, *International Journal Of eBusiness and eGovernment Studies*, *11*(1), 16-33. DOI: 10.34111/ijebeg.20191112

Muller, S. M. (2019), *South Africa's finances are in bad shape: it's running out of time to fix them*, Retrieved from: https://theconversation.com/south-africas-finances-are-in-bad-shape-its-running-out-of-time-to-fix-them-121464 (accessed 7 July 2022).

Nabi, I. (2016), *Globalization: what the West can learn from Asia*, Brookings, 30 Jun. Retrieved from: https://www.brookings.edu/blog/future-development/2016/06/30/global ization-what-the-west-can-learn-from-asia/#:~:text=Globalization%20has%20been %20hugely%20beneficial,exchanges%2C%20and%20rapid%20economic%20growth. (accessed 11 August 2022).

National Treasury. (2021). *Debt management report*, Retreived from: http://www.treasury.gov.za/publications/other/Debt%20Report/Debt%20Management%20Report%202020-21.pdf (accessed 9 May 2022).

National Treasury. (2022), Budget 2022, Retrieved from: http://www.treasury.gov.za/ documents/national% 20budget/2022/speech/speech.pdf (accessed 9 May 2022).

National Treasury. (2023), Budget 2023: budget review, Pretoria: Government Printer.

Ndikumana, L., Naidoo, K., Aboobaker, A. (2020), *Capital flight from South Africa: a case study*, PERI working paper no. 516, Amherst, MA: Political Economy Research Institute.

Neely, C. (2022), *Inflation and the real value of debt: a double-edged sword*, Retrieved from: https://www.stlouisfed.org/on-the-economy/2022/aug/inflation-real-value-debt-double-edged-sword (accessed 12 February 2023).

Ngondo, M., Khobai, H. (2018), *The impact of exchange rate on exports in South Africa*, Retrieved from: https://mpra.ub.uni-muenchen.de/85079/1/MPRA_paper_85079.pdf (accessed 21 February 2023).

Okonjo-lweala, N., Coulibaly, B. S. (2019), *Making globalization work for Africa*, Brookings. Retrieved from: https://www.brookings.edu/opinions/making-globalization-work-for-africa/ (accessed 12 February 2023).

Ostadi, H., Ashja, S. (2014), *The relationship between external debt and foreign direct investment in D8 member countries* (1995–2011), WALIA Journal, 30(S3), 18-22.

Park, J. (1992), Canonical cointegrating regressions, *Econometrica*, *60*(1), 119–143. DOI: https://doi.org/10.2307/2951679

Porto, A., Porto, N., Garbero, N. (2016), The impact of globalization on subnational expenditures: efficiency and compensation effects, *Journal of Finance and Economics*, *4*(2), 1-22. DOI: http://dx.doi.org/10.12735/jfe.v4n2p01

Pyeman, J., Noor, N. H. H., Mohamad, W. M. F. W., Yahya, A. A. (2016), Factors affecting external debt in Malaysia: an empirical investigation, *International Journal of Economics and Financial Issues*, *7*(1), 234-240. DOI: https://doi.org/10.1007/978-981-287-426-9_39

Raeskyesa, D.G.S., Suryandaru, R.A. (2020), Competitiveness and FDI inflows in ASEAN member countries, *International Journal of Business and Economic Sciences Applied Research*, *1*(2), 14-20.

Rahman, M.S. Junsheng, H., Shahari, F., Aslam, M., Mehedi, M., Hasanul Banna, M., Liya, M. (2015), Long-run relationship between sectoral productivity and energy consumption in Malaysia: an aggregated and disaggregated viewpoint, *Energy 86*(1), 436–45. DOI: https://doi.org/10.1016/j.energy.2015.04.049

Rodrik, D. (1998), Why do more open economies have bigger governments? *Journal of Political Economy*, *106*(5), 997–1032. DOI: https://doi.org/10.1086/250038

Rodrik, D. (2018), *New technologies, global value chains, and the developing economies*, NBER working paper no. 25164, Cambridge, MA: National Bureau of Economic Research.

Saikkonen, P. (1992), *Estimation and testing of cointegrated systems by an autoregressive approximation*, Econometric Theory, 8(1), 1–27. DOI: 10.1017/S0266466600010720

Salahuddin, M., Vink, N., Ralph, N., Gow, J. (2020), *Globalisation, poverty, and corruption: retarding progress in South Africa*, Development Southern Africa, 37(4), 617-643. DOI:10.1080/0376835X.2019.1678460

SARB (South African Reserve Bank). (2021), *Government debt-service costs dilemma: quarterly bulletin*, Pretoria: South African Reserve Bank.

SARB (South African Reserve Bank). (2023), Online statistical query, Retrieved from, https://www.resbank.co.za/en/home/what-we-do/statistics/releases/online-statistical-query (acccessed 12 February 2023).

Sebake, B.K. (2017), *Neoliberalism in the South African post-apartheid regime: economic policy positions and globalisation impact*, Retrieved from: http://ulspace.ul.ac.za/ bitstream/handle/10386/1860/sebake_neoliberalism_2017.pdf (accessed: 12 March 2023).

Sener, S., Bayrakdar, S., Hacioglu, V. (2015), The analysis for the validity of compensation and efficiency hypotheses in Turkey between 1975 and 2013, *Procedia – Social and Behavioral Sciences*, *195* (2015), 624–631. DOI: https://doi.org/10.1016/j.sbspro.2015.06.143

Signé, L., Johnson, C. (2021), *Africa's mining potential: trends, opportunities, challenges, and strategies*, Policy paper no. 21/10, Rabat: Policy Center for the new South.

Sinha, P., Arora, V., Bansal, V. (2011), *Determinants of public debt for middle income and high-income group countries using panel data regression*, MPRA working paper no. 32079, Munich: University Library of Munich.

Solakoglu, O. (2016), Three different perspectives on the role of the nation-state in today's globalized world, *European Scientific Journal*, *20*(1), 1-8.

Stats SA (Statistics South Africa). (2019), *Five facts about poverty in South Africa*, Retrieved from: https://www.statssa.gov.za/?p=12075 (accessed 4 July 2022).

Swamy, V. (2020), Debt and growth: decomposing the cause-and-effect relationship, *International Journal of Finance & Economics*, *25*(2), 141–156. DOI: https://doi.org/ 10.1002/ijfe.1729

Thakoor, V. (2020), *Market power, growth, and inclusion: the South African experience*, IMF working paper no. 20/206, Washington, D.C.: International Monetary Fund.

Toda, H., Yamamoto, T. (1995), Statistical inference in vector autoregressions with possibly integrated processes, *Journal of Econometrics*, *66*(1), 225–50. DOI: https://doi.org/ 10.1016/0304-4076(94)01616-8

Tsunekawa, K. (2019), *Globalisation and the emerging state: past advance and future challenges emerging states and economies*, in: T. Shiraishi and T. Sonobe (Eds.), *Emerging states and economies* (pp. 31-71), Singapore: Springer.

Ukpere, W.I., Slabbert, A.D. (2009), A relationship between current globalisation, unemployment, inequality and poverty, *International Journal of Social Economics*, *36*(1/2), 37-46. DOI: 10.1108/03068290910921172

Van Cauwenbergh, L., Laleman, J.P. (2018), *Rapid public debt build-up in sub-Saharan Africa*, Retrieved from: https://www.credendo.com/country-news/rapid-public-debtbuild-sub-saharan-africa (accessed 12 April 2023).

WEF (World Economic Forum). (2019), *5 hidden ways that globalisation is changing*, Retreieved from: https://www.weforum.org/agenda/2019/02/5-hidden-ways-thatglobal ization-is-changing (accessed 9 May 2022).

World Bank. (2022), *New world bank report assesses sources of inequality in five countries in Southern Africa*, Retreived from: https://www.worldbank.org/en/news/pressrelease/ 2022/03/09/new-world-bank-report-assesses-sources-of-inequality-in-five-countries-in-southern-africa (accessed 4 July 2022).

World Bank. (2023), World development indicators, Retrieved from: https://databank.world bank.org/source/world-development-indicators (accessed 1 April 2023).

Wu, J, Bahmani-Oskooee, M., Chang, T. (2018), Revisiting purchasing power parity in G6 countries: an application of smooth time-varying cointegration approach, *Empirica 45*(1),187–96. DOI: https://doi.org/10.1007/s10663-016-9355-1

Wu, W., Zhang, L., Mahalik, M.K., Wan, Q., Gozgor, G., Lu, Z. (2022), Revisiting the globalisation-welfare state nexus: what about the quality of the social welfare? *Economic Research-Ekonomska Istraživanja*, *1*, 1-29. DOI: https://doi.org/10.1080/1331677X.2022.2147978

Yildirim, D., Orman, E.E. (2018), The Feldstein-Horioka puzzle in the presence of structural breaks: evidence from China, *Journal of the Asia Pacific Economy*, *23*(1), 374–392. DOI:

Yildiz, F., Sağdic, E.N. (2021), *The effects of globalisation on public expenditures, tax revenues, and public debt: empirical evidence from the European countries*, in: F. Yildiz, and E.N. Sağdic (Eds.), *Handbook of research on institutional, economic and social impacts of globalisation and liberalisation* (pp.287-305), Pennsylvania: IGI-Global.

Zafar, S., Butt, M. S. (2008), *Impact of trade liberalization on external debt burden: econometric evidence from Pakistan*, MPRA working paper no. 9548, Munich: University Library of Munich.

Zivot, E., Andrews, D. (1992), Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis, *Journal of Business and Economic Statistics*, *20*(1), 25–44. DOI: https://doi.org/10.1198/073500102753410372

Moitshepi Moeng, MCom candidate in Economics. She is a student at the North-West University and fellow researcher in the TRADE research focus area. She completed her honours degree in Economics in 2022 Cum Laude. Her research interests include, public debt management with a particular focus in globalisation studies. ORCID no. https://orcid.org/0000-0001-5109-843X

Jacques de Jongh, holds a PhD in Economics and currently serves as a Senior Lecturer and Programme Leader for the Economics Subject Group at the North-West University. He is a senior researcher of the TRADE research focus area. His primary research focus is on globalisation and economic development and research contributions extend across several domains, including labor market studies, macroeconomics, and small business development. Jacques has published over 30 peer-reviewed and accredited manuscripts and has attended several national and international conferences. He serves as a reviewer for a number of Scopus and WoS-listed journals within his area of expertise. ORCID no. https://orcid.org/0000-0001-8672-0292