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ECONOMIC GLOBALISATION AND GOVERNMENT SIZE: TESTING THE COMPENSATION HYPOTHESIS IN SOUTH AFRICA'S PUBLIC SECTOR

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─Abstract ─

Globalisation has become one of the most profound processes to influence both developed and developing regions. No more so has this been evident than in the South African economy. The country's democratic transition attributed the adoption of a less protectionist and liberal economic orthodoxy aimed to facilitate social and economic development. While the introduction of trade agreements and an influx of FDI has contributed to enhanced infrastructure, the impact of globalisation on the role of the state has raised several questions. Some suggest that economic globalisation spurs on fiscal growth by increasing social expenditure (compensation hypothesis). Others theorise that mobile capital in a more competitive financial environment has limited the role of the state (efficiency hypothesis). In light of this debate and concerns of unstainable fiscal growth in South Africa, the study's primary objective was to analyse the relationship between economic globalisation, social expenditure and tax revenue in the South African economy. Secondary annual time series data from 1995 to 2018 were used. Two ARDL models were employed to test the long-run relationships, while the ECM assisted in estimating the short-run dynamics. Results for both the short- and long-run together with the causality analysis provide evidence that refutes the notion that a more integrated South African economy induces external shocks. The findings rather support the efficiency view. In this regard, competitive financial markets coupled with a high tax burden and fiscal debt concerns have reduced the state's revenue capacity, limiting the potential to further social development. In addressing these concerns, government needs to proliferate strategies that advance fiscal consolidation and policy certainty, and implement structural reforms that facilitate inclusive growth.

Key Words: *ARDL, globalisation, public sector, South Africa, social development*

JEL Classification: F6; H1; H5.

1. INTRODUCTION

Over the last two decades, countries around the globe have shown strong interdependencies across various dimensions, including political, social and economic spheres (Gygli *et al.*, 2019). From sharing cultural values, the emergence of political alliances and the presence of cross border capital flows, globalisation has had an incredible impact on most countries' objective of promoting a decent standard of living. Earliest proponents of the process promoted the notion that a more connected world would benefit nations, allowing greater efficiency in production practices, enhanced flows of information and the promotion of technological innovation (Stiglitz, 2003). However, as time has progressed, many have come to consider the negative effects of the process (Potrafke, 2018). Critics have pointed to the fact that while for some countries these advantages are realised, many have been exposed to turbulence in the global economy, instilling significant amounts of uncertainty and volatility in various aspects. Among these, the relationship between economic globalisation and public sector composition has been universal and highly contested (Gözgör *et al.*, 2019).

From these perspectives, two schools of thought have emerged, which have described the dynamics of this relationship. Among the supporters of the first, it is believed that increased participation in trade and financial liberalisation induces external shocks that increase the need for social expenditure, consequently promoting governments' role in the economy (Rodrik, 1998). The second, contrastingly, theorises that higher levels of international economic integration allow for greater capital mobility. Through this, public sector size is reduced by imposing tax constraints and enforcing productive expenditure in order to attract foreign direct investment (FDI) (Mishra, 1999). While studies across different countries have shown mixed support in these views, the South African case poses an intricate situation. Where the apartheid regime was largely characterised by protectionist economic agendas, the democratic transition attributed the adoption of a liberal economic orthodoxy aimed at facilitating economic development (Carmody, 2012). Globalisation in this regard was primarily an internally-driven occurrence, significantly differing from most other nations (Sebake, 2017).

Based on these ambiguities and the current concerns pertaining to significantly high fiscal debt and the sustainability of the welfare state, the study seeks to add

to the limited knowledge surrounding this relationship in South African. In doing so, it seeks to test the compensation and efficiency hypotheses in explaining the dynamics between economic globalisation and public sector composition. The sections that follow pertain a literature review where after the methodology is explained. Subsequent to this, the study discusses the results and concludes with a discussion on the various implications on the matter at hand.

2. LITERATURE REVIEW

2.1. Conceptualisation of economic globalisation

As a concept, globalisation has attracted a significant amount of interest. From the earliest of conceptualisations, the process of a more interconnected world was predominantly viewed as the increase in the multinational character of businesses and organisations (Al-Rodhan & Stoudmann, 2006). Proponents of these views ensued that a globalised world mainly entailed the emergence of intercontinental trade, which was brought about through, arguably, processes of colonialism and the geographic discoveries during the start of the Afroeurasian world system (Katona *et al.,* 2013). As time has progressed, however, these conceptualisations have largely been augmented. This has come based on the realisation that globalisation cannot be viewed as a single concept nor that it can be understood under a specific timeframe (Pannilage, 2017). Rather, based on the developments after colonialisation, including the emergence of capitalist economic systems and various contemporary cross-border political alliances, globalisation has come to be understood over a multitude of disciplines (Deininger, 2014).

In light of the multidimensionality of the process, the comprehension of globalisation has been difficult. Larsson (2001:9) explains it from a geographical and logistical perspective as "*a process of world shrinkage, of distances getting shorter and things moving closer*". While, from more social disciplines, globalisation is viewed in the manner in which family life and community dynamics have been changed through the inclusion or exclusion of individuals in a more connected society (Gręboszand Hak, 2015). Despite these different understandings, most accepted definitions have primarily referred to the process as *"a gradual integration of economies and societies driven by technologies, new economic relationships and the policies of a wide range of actors, including governments, international organizations, labour and society*" (Gunter & van der Hoeven, 2004:7). Based on these understandings, the discourse surrounding the process has compartmentalised globalisation in three distinct dimensions. These

include economic, cultural and political spheres, all of which have played a significant role in structuring global socio-economic activities (Deininger, 2014).

2.2. Complexities and benefits of economic globalisation

Taking into regard the different dimensions, the impact that globalisation has had specifically on the development of economies around the globe has been unprecedented. Gręboszand Hak (2015) refer to the advantages the process has afforded many countries including the diffusion of technology, enhanced factor productivity and the augmentation of capital. Moreover, it is believed that countries have benefitted through enhanced knowledge transfers as well as positive trade participation (Eugster *et al.,* 2018). While these proponents have expressed the benefits of a connected world, some have reiterated that the advantages have not been realised by all. In fact, scholars have expressed the fact that globalisation has impeded development primarily in countries with weak institutions and political instability (Amavilah *et al.,* 2017). From these views, a more global society has hampered domestic economic activity through the increased possibility of environmental degradation, the exacerbation of structural inequality and increased poverty levels (Kishan, 2018). These complexities have primarily been due to the inability of governments to keep pace with volatile conditions and maintain support across a broad base of their populations.

Inherent in this has been the dynamics between the economic dimension of globalisation and the role that public sectors play in the economy. Here, the intensification of a country's international economic exchanges through the flow of goods and capital and the relaxation of certain regulatory practices in trade agreements pose several implications for governments (Kim & Zurlo, 2009). These have been expressed in two competing hypotheses. The first posits that economic globalisation induces the need for a larger public sector. This school of thought, *the compensation hypothesis*, suggests that when economies are more *"open"*, they are subject to greater volatility (Rodrik, 1998). This consequently induces more economic insecurity in domestic markets, either in the form of a higher likelihood of cyclical unemployment or lower income levels, both prompting demand for social welfare policies (Koster, 2009).

Contrary to the above, *the efficiency hypothesis* postulates that economic globalisation and public sector size exhibit an inverse relationship (Blackmon, 2006). This view asserts that the globalisation of economic activity induces pressure on the autonomy of government and their instrumental capacity. From this perspective, more competitive financial markets are said to increase the

mobility of capital (OECD, 2017). Countries with comparatively high corporate and income tax rates tend to be less competitive than those with lower rates. As a result, these countries experience a greater likelihood of capital flight and with it added strain on generating the needed tax revenue. In addition, Potrafke (2018) explains that the heightened competition is usually followed by governments responding through reducing tax rates that would result in what has come to be known as the "*race to the bottom"* and with it a more austere fiscal policy.

2.3. Evidence from South Africa and other developing countries

While research in this regard has shown mixed results, the relationship between globalisation and public sectors holds significant relevance, especially within the South African context. Showcasing a somewhat unique internal adoption of the globalisation process, fiscal policy has played a pivotal role in promoting social development (Donaldson, 2018). In fact, since 1994, government's social expenditure has averaged at around four per cent of its gross domestic product (GDP), somewhat higher than similar developing countries such as Jamaica (1%) and Argentina (1.5%) (Mtantato & Ngozo, 2018). Moreover, in addressing the irregularities of the past, it has established one of the most comprehensive social grant systems in the developing world, where more than 33 per cent of the population are beneficiaries (Fanta *et al.*, 2017). Despite this, the country has likewise had to contend with the significant waves of globalisation since its transition to democracy. Being regarded as only a moderate globaliser, the economy has had to manage a volatile exchange rate, significant fluctuations in FDI inflows together with a poor current account performance (Ngondo & Khobai, 2018). The process, however, has also attributed an advantageous regional integration with participation in various custom unions. This has been coupled with the involvement in a range of cross-continental trade agreements both with the European Union and the USA, proving beneficial for trade competitiveness (Chideme, 2016). Nevertheless, concerns surrounding the level of economic integration and its relationship with the government's objectives have become significant. This has largely come as a result of the emergence of unstainable levels of fiscal debt, mounting pressure on tax revenue as well as the sustainability of social welfare programmes (Bond & Malikane, 2019).

In light of the inherent complexities, various studies have aimed to shed light on the compensation-efficiency debate. From a developed context, results have been somewhat mixed. Garret and Mitchell (2001), in their study, employed a dynamic time-series cross-section model of 19 OECD countries from 1973 to 1997,

showing a negative relationship between FDI inflows, capital liberalisation and public social expenditure. However, in their study, through the use of a panel of G7 countries between 1980 and 2015, Bayat *et al.* (2017) showed a positive relationship between trade openness and government expenditure. Additionally, from a more qualitative perspective, through the use of an open methods of coordination method, Lammers *et al.* (2018) show evidence supporting the positive relationship describing how the global financial crisis and strong integrated financial markets played a significant role in establishing contemporary EU social policy. Evidence for developing countries, however, has mainly supported the efficiency hypothesis. Kaufman and Segura-Ubiergo (2001), in this regard, for 14 Latin American countries, through the use of dynamic time series modelling, showed a negative relationship. Likewise, in their panel study of 92 developing countries across Africa, Latin America, the Middle East and Europe, Gözgör *et al*. (2019) show support for the efficiency hypothesis. These results were also confirmed by Olawole and Adebayo (2017) for Nigeria, in which the study confirmed that heightened capital mobility undermines fiscal policy's ability to raise tax revenue, reducing and redirecting expenditure.

3. RESEARCH METHODOLOGY

The study had the primary objective of analysing the relationship between economic globalisation levels, social expenditure and tax revenue in South Africa. A quantitative research approach through the use of an econometric time series analysis was used together with an adoption of a functionalist paradigmatic view.

3.1. Data and sample period

The econometric time series analysis made use of secondary data ranging from 1995 to 2018. Included variables comprised real public sector social expenditure, tax revenue as a percentage of GDP and economic globalisation levels measured through the KOF Swiss Economic Institute's economic globalisation index. The latter consists of a combination of 15 *de facto* and *de jure* trade and finance variables, which are all weighted according to a time-varying principal component analysis. Following suit with similar studies (Gözgör *et al.*, 2019), population size, the real effective exchange rate, and consumer price inflation were included as control variables for country size and macroeconomic stability. Variables were transformed to their natural logarithm. Table 1 provides an overview of the included variables and the databases from which data were collected.

Table 1: Variable description and data source identification

Variable	Measure	Data base
Tax revenue (TAX)	Tax as % of GDP	Quantec
Social expenditure (SE)	Real public sector social expenditure (R) as % of GDP	Quantec
Consumer price inflation (CPI)	CPI index	SARB
Real effective exchange rate (EXCH)	Real effective exchange rate index	SARB
Economic globalisation (ECG)	KOF globalisation index ranging from 0 – 100. A higher score indicates higher levels of economic globalisation.	KOF Swiss Economic Institute
Population size (PS)	Number of individuals	Quantec

3.2. Model description

The analysis made use of the autoregressive distributed lag (ARDL) model refined by Pesaran *et al.* (2001). The motivation for the model's selection is based on its ability to be utilised when variables are not integrated of a similar order – an advantage it holds over similar econometric techniques. The latter requires all variables to be integrated at first order. The ARDL model, however, can be estimated when variables are stationary at I(0), I(1) or even presents a mixture of these variables. The model likewise has shown to provide robust and accurate results when used with smaller sample sizes. For the purpose of accurately achieving the objective of the study, two models were employed:

$$\Delta LSE = \varphi_0 + \sum_{j=1}^{k} \eta_j \Delta LSE_{t-j} + \sum_{j=1}^{k} \alpha_j \Delta LECG_{t-j} + \sum_{j=1}^{k} \beta_J \Delta LCPI_{t-j} + \sum_{j=1}^{k} \gamma_j \Delta LEXCH_{t-j} + \sum_{j=1}^{k} \delta_j \Delta LPS_{t-j}$$
$$+\omega_1 \Delta LSE_{t-1} + \omega_2 \Delta LEG_{t-1} + \omega_3 \Delta LCPI_{t-1} + \omega_4 \Delta LEXCH_{t-1} + \omega_5 \Delta LPS_{t-1} + \mu_t \quad \text{.....(1)}$$

$$\Delta LTAX = \varphi_0 + \sum_{j=1}^{k} \eta_j \Delta LTAX_{t-j} + \sum_{j=1}^{k} \alpha_j \Delta LECG_{t-j} + \sum_{j=1}^{k} \beta_J \Delta LCPI_{t-j} + \sum_{j=1}^{k} \gamma_j \Delta LEXCH_{t-j} + \sum_{j=1}^{k} \delta_j \Delta LPS_{t-j}$$
$$+\omega_1 \Delta LTAX_{t-1} + \omega_2 \Delta LEG_{t-1} + \omega_3 \Delta LCPI_{t-1} + \omega_4 \Delta LEXCH_{t-1} + \omega_5 \Delta LPS_{t-1} + \mu_t \quad \text{..... (2)}$$

where ΔLSE refers to the change in the natural logarithm of public sector expenditure, ΔLECG the change in the natural logarithm of economic globalisation levels, ΔLCPI the change in the natural logarithm of consumer price inflation, ΔLEXCH the change in the natural logarithm of the real effective exchange rate, ΔLPS the change in the natural logarithm of the population size

and u_t the error term. The short-run coefficients are presented by $\eta_j, \alpha_j, \beta_j, \gamma_j, \delta_j$ while k showcases the number of lags included in both models. Furthermore, the long-run coefficients are expressed by $\omega_1, \omega_2 .. \omega_n$. Following equations 1 and 2 as shown above, the study formulates the following hypotheses:

Null hypothesis (H_0): No co-integration between the variables

Alternative hypothesis (H_1): Presence of co-integration between the variables

With the purpose of testing these hypotheses, a bounds testing procedure is undertaken in which a calculated F-statistic is compared to lower- and upper-bound critical values as established by Pesaran *et al.* (2001). If the calculated F-statistic is found to exceed the critical values, the null hypothesis (indicating the absence of co-integrating variables) can be rejected in favour of the alternative hypothesis. However, if the calculated F-statistic is found to be lower than both these values, then the null hypothesis cannot be rejected. Subsequent to this process, and on the condition that the null hypothesis is, in fact, rejected, an error correction model (ECM) must be estimated with the purpose of determining the speed of adjustment back to equilibrium, while likewise determining the short-run dynamics between the variables. For this purpose, the models that are used can be expressed as follows:

$$\Delta LSE = \varphi_0 + \sum_{j=1}^{k} \eta_j \Delta LSE_{t-j} + \sum_{j=1}^{k} \alpha_j \Delta LECG_{t-j} + \sum_{j=1}^{k} \beta_J \Delta LCPI_{t-j} + \sum_{j=1}^{k} \gamma_j \Delta LEXCH_{t-j} + \sum_{j=1}^{k} \delta_j \Delta LPS_{t-j}$$
$$+\theta ECT_{t-1} + \mu_t \ldots\ldots\ldots (3)$$

$$\Delta LTAX = \varphi_0 + \sum_{j=1}^{k} \eta_j \Delta LTAX_{t-j} + \sum_{j=1}^{k} \alpha_j \Delta LECG_{t-j} + \sum_{j=1}^{k} \beta_J \Delta LCPI_{t-j} + \sum_{j=1}^{k} \gamma_j \Delta LEXCH_{t-j} + \sum_{j=1}^{k} \delta_j \Delta LPS_{t-j}$$
$$+\theta ECT_{t-1} + \mu_t \ldots\ldots\ldots (4)$$

For both these equations, ECT_{t-1} denotes the error correction term and θ signifies the coefficient of the error correction term. The latter is utilised in order to measure the speed of adjustment back to equilibrium. Finally, with the purpose of determining the presence of any causal relationships between the variables, the study applied the Toda-Yamamoto Granger causality test. This approach employs a block exogeneity Wald test in an augmented VAR model. The model is estimated regardless of the order of integration of the variables and estimated with a lag order of (k $+dmax$), where d indicates the maximum potential lag order and k the true lag order. The model tests whether the included variables' coefficients'

lagged values are equal to zero (presence of causality). If it is found that these values are not equal to zero, however, it signifies the absence of causality.

4. RESULTS AND DISCUSSION

4.1. Correlation analysis

As part of the descriptive inquiry, the study employed correlation analysis in order to determine the nature and strength of the relationship between the variables. Table 2 shows the results of the analysis. Here, social expenditure attributed strong positive associations with both population size and consumer price levels, while only a positive medium relationship seems to exist with economic globalisation. On the other hand, tax revenue levels attribute significant and positive associations with population size as well as consumer price levels, somewhat confirming *a priori* expectations. While these relationships exuded strong positive associations, economic globalisation and social spending as well as tax revenue, contrastingly, showcased medium and low negative associations.

Table 2: Correlation results among the selected variables

Probability	**LSE**	**LTAX**	**LECG**	**LPS**	**LEXCH**	**LCPI**
LSE	1.00000					

LTAX	0.52640	1.00000				
	(0.0118)**	-----				
LECG	-0.24791	-0.48794	1.00000			
	(0.2660)	(0.0212)**	-----			
LPS	0.79031	0.78169	0.70659	1.00000		
	(0.0000)*	(0.0000)*	(0.0002)*	-----		
LEXCH	-0.22989	-0.07461	-0.58723	-0.40807	1.00000	
	(0.3034)	(0.7414)	(0.0041)*	(0.0594)***	-----	
LCPI	0.78374	0.76408	0.73196	0.99281	-0.47261	1.00000
	(0.0000)*	(0.0000)*	(0.0001)*	(0.0000)*	(0.0263)**	-----

*Note: () shows p-values, * significance at 1% level; ** 5% level; *** 10% level of significance*

4.2. Unit root analysis

Following the correlation analysis, the study made use of the augmented Dickey-Fuller (ADF) unit root test in order to determine the selected variables' order of integration. While ARDL models can be used with either I(0) or I(1) variables, the use of variables that are integrated at the second order will render the computed F-statistics of the bounds testing procedure invalid. Table 3 reports the results of the unit root test that was applied. Based on these estimates, among the six selected variables, four (*LPS, LEXCH, LCPI* & *LTAX*) variables were integrated at the first order, while only *LSE* and *LECG* were stationary at level.

Table 3: Augmented Dickey-Fuller (ADF) unit root test results

Variable	Levels				1st difference				I(0)/ I(1)
	Intercept		Trend & intercept		Intercept		Trend & intercept		
LSE	-0.673	0.8281	-3.180	0.1162	-6.793	0.0002*	-3.769	0.0126**	I(1)
LTAX	-1.489	0.5193	-3.082	0.1367	-3.484	0.0197**	-3.386	0.0816***	I(1)
LECG	-5.013	0.0008*	-3.694	0.0468**	-2.901	0.0630***	-3.971	0.0279**	I(0)
LPS	-1.454	0.5360	-0.317	0.9841	-4.168	0.0047*	-6.793	0.0002*	I(1)
LEXCH	-2.289	0.1846	-2.565	0.2973	-4.019	0.0064*	-3.903	0.0317**	I(1)
LCPI	-1.174	0.6650	-2.704	0.2451	-3.306	0.0291**	-3.518	0.0660***	I(1)

*Note: * denotes significance at 1% level; ** 5% level; *** 10% level of significance*

4.3. Bounds testing and long-run analysis

Testing whether a more integrated South African economy ascribed to movements of the compensation or efficiency hypothesis, the study employed two models. The first model made use of social expenditure as the dependent variable. In conjunction with this, and with the purpose to enhance the robustness of the results, the second model used tax revenue levels as the dependent variable. Automatic lag selection was used by means of the SBIC information criterion to select the models. Based on this, the two models were estimated as ARDL 1 (1,2,1,2,2) and ARDL 2 (1,2,2,0,1). Thereafter, bounds testing was carried out in order to estimate the long-run relationships. Results for these tests are reported in Table 4. The estimated F-statistics for Model 1 were calculated at 7.372 and 5.031 for Model 2. Both values exceeded the critical values, which inferred the presence of co-integration and the existence of the long-run relationships.

Table 4: Bounds test results for both selected models

Model	Estimated F-value	Pearson critical values			Presence of co-integration
		Sig. level	Lower bound	Upper bound	
Model 1 *DV: LSE*	7.37221	10%	2.45	3.52	Co-integration confirmed
		5%	2.86	4.01	
		2.5%	3.25	4.49	
		1%	3.74	5.06	
Model 2 *DV: LTAX*	5.03163	10%	2.45	3.52	Co-integration confirmed
		5%	2.86	4.01	
		2.5%	3.25	4.49	
		1%	3.74	5.06	

Results shown in Table 5 depict the coefficients for the long-run relationships. As shown, from Model 1, the coefficients for LECG were estimated at -0.375, which infers a negative relationship between economic globalisation and social expenditure patterns. In other words, this implies that if the economic globalisation levels increase by 1 per cent, it would infer a 0.374 per cent decline in social expenditure. In support of these findings, results for Model 2 likewise showed a statistically significant (*p-value = 0.0465*) negative relationship between LECG and LTAX. From this, it infers that a more globally integrated South African economy induces pressure on fiscal policy to attract tax revenue. Kim and Zurlo (2009) explain that induced global competition towards enticing more mobile capital limits the capacity of governments to obtain the necessary funding, especially when local tax conditions are not conducive. This then holds various consequences for the welfare state, given that limited spending is directed more towards restraining the loss of capital and away from social objectives.

Table 5: Long-run coefficients

Model		Variables	Coefficient	Std. error	t-statistic	Prob.
Model (1,2,1,2,2) DV: LSE	*1*	LECG	-0.374151	0.068700	-5.446163	0.0010*
		LPS	0.148431	0.285443	0.520002	0.6191
		LEXCH	0.042412	0.179456	0.236336	0.8199
		LCPI	0.166325	0.151973	1.094437	0.3100
		C	2.064346	0.601341	3.432901	0.0109*
Model (1,2,2,0,1) DV: LTAX	*2*	LECG	-0.131418	0.070483	-2.218698	0.0465**
		LPS	-0.526277	0.317314	-1.658539	0.1316
		LEXCH	0.130010	0.162298	0.801060	0.4437
		LCPI	0.370448	0.174933	2.117660	0.0633***
		C	2.388464	0.546741	4.368551	0.0018*

*Note: * denotes significance at 1% level; ** 5% level; *** 10% level of significance*

4.4. ECM and short-run analysis

After confirming the presence of co-integration among the variables, an ECM model was estimated with the purpose to determine the speed of adjustment back to equilibrium. Table 6 illustrates the results for both the models. It specifically showcases the short-run coefficients as well as the error correction terms. The latter for both models was negative and statistically significant, which confirms error correction in the two co-integrating relationships. Additionally, the ECT coefficient for Model 1 *(-0.5684*) suggests that, for each year, 56.84 per cent of the distortions to equilibrium in social expenditure are eliminated. In comparison, results for Model 2 (ECT *coeff. = -0.8132*) suggest a slightly more rapid return to equilibrium, taking approximately 1.23 years to eliminate distortions in tax revenue levels.

Based on the short-run coefficients depicted in Table 6, the results seem to correspond with those reported for the long run. Social expenditure and tax revenue seem to be negatively affected by aspects such as more openness to trade, the country's participation in various trade agreements as well as the ability to hold diversified international investment portfolios. These results lend credence to the efficiency hypothesis within the South African public sector, supporting the results of similar studies conducted within more developing contexts (Gözgör *et al.,* 2019). Finally, upon viewing the results between the various chosen control

and dependent variables, estimates provide evidence that confirms expected relationships. For instance, results show that population size affects social expenditure positively (Borcherding, 1977), while both higher inflation levels and a depreciation in the real effective exchange rate increase tax revenue collection (Friedman, 1941).

Table 6: ECM results and short-run coefficients

Model	Variables	Coefficient	Std. error	t-statistic	Prob.
Model 1 (1,2,1,2,2) DV: LSE	D(LECG)	-0.145632	0.083406	-3.442269	0.0074*
	D(LECG(-1))	0.150899	0.066043	2.284854	0.0562***
	D(LPS)	0.422211	0.188542	2.239352	0.0601***
	D(LEXCH)	0.010180	0.061926	0.164396	0.8741
	D(LEXCH(-1))	-0.103567	0.071822	-1.441988	0.1925
	D(LCPI)	-0.100782	0.074591	-1.351132	0.2187
	D(LCPI(-1))	-0.267632	0.101441	-2.638307	0.0335**
	CointEq(-1)	-0.568471	0.195194	-2.912333	0.0226**
Model 2 (1,2,2,0,1) DV: LTAX	D(LECG)	-0.216281	0.139287	-4.697591	0.0015*
	D(LECG(-1))	-0.105609	0.070178	-1.504872	0.1666
	D(LPS)	0.165340	0.371702	0.444819	0.6670
	D(LPS(-1))	0.431496	0.213365	2.022341	0.0738***
	D(LEXCH)	-0.105728	0.111398	-0.949103	0.3674
	D(LCPI)	0.549784	0.159716	2.081628	0.0825*
	CointEq(-1)	-0.813228	0.258786	-3.142473	0.0119*

*Note: * denotes significance at 1% level; ** 5% level; *** 10% level of significance*

4.5. Toda-Yamamoto Granger causality analysis

In instances where there is a presence of co-integration among the variables, it suggests the existence of at least one causal relationship (Granger, 1988). Therefore, the study ensued with causality analysis making use of the Toda-Yamamoto Granger approach for which results are shown in Table 7. As depicted, LECG and LSE seem to exhibit a bidirectional relationship, as do LTAX and LECG. While this confirms that economic globalisation causes changes in social expenditure levels as well as those attributed in taxation levels, it also suggests

both to impact the *de facto* and *de jure* changes regarding the South African economy's global integration.

In addition to this, results from Table 7 furthermore confirm a one-directional causal relationship emanating from LPS, LEXCH and LCPI toward LECG. Here, changes in population figures as well as exchange rate fluctuations have an effect not only on the trade of goods and services, but likewise decisions regarding the participation in trade agreements and investment restrictions. These interdependencies, according to Bostan *et al.* (2018), can largely be ascribed to countries' objective to maintain competitiveness in expanded financial markets. From this point of view, fluctuations in prices and currency valuations tend to influence decisions within the trade environment. Specifically, where changes are rapid, export-import performance is affected. However, if these fluctuations are sustained, policymakers seek to implement new policies (Kang & Dagli, 2018).

Table 7: Toda-Yamamoto Granger causality results

Variable	***Dependent variables***					
	LSE	**LPS**	**LEXCH**	**LECG**	**LCPI**	**LTAX**
LSE	-----	0.86737	1.66771	43.0122	11.4449	16.2369
		(0.6481)	(0.4344)	(0.0000*)	(0.0033*)	(0.0003*)
LPS	0.94924	-----	0.47622	19.6059	0.61010	7.27739
	(0.6221)		(0.7881)	(0.0001*)	(0.7371)	(0.0263*)
LEXCH	0.27954	0.89116	-----	5.19625	0.639607	9.40779
	(0.8696)	(0.6405)		(0.0744***)	(0.7263)	(0.0091*)
LECG	6.55616	2.36539	0.44437	-----	2.64385	6.61475
	(0.0377**)	(0.3065)	(0.8008)		(0.2666)	(0.0366**)
LCPI	0.89508	1.59944	0.88278	37.4481	-----	3.12398
	(0.6392)	(0.4495)	(0.6431)	(0.0000*)		(0.2097)
LTAX	2.26601	2.09722	0.14496	20.2647	0.34247	-----
	(0.3221)	(0.3504)	(0.9301)	(0.0000*)	(0.8426)	

*Note: () shows p-value; * significance at 1% level; ** 5% level; *** 10% level of significance*

4.6. Diagnostic and stability tests

As the final step in the analysis, the study employed various diagnostic tests with the purpose of analysing the robustness of the short-run estimates. In doing so, tests for normality, heteroscedasticity as well as autocorrelation were utilised for which results are reported in Table 8. Based on these estimates, residuals for both the used models were normally distributed, homoscedastic and no serial correlation was present. In addition to these diagnostics, results pertaining Ramsey's RESET test confirmed the aptness of the models' functional form.

Table 8: Residual diagnostics and model stability results

Item	**Test**	***Model 1 (1,1,2,2,2)***		***Model 2 (1,0,2,2,1)***	
		p-value	**Result**	***p-value***	**Result**
Normality	Jarque-Bera	0.8894	Normally distributed	0.5367	Normally distributed
Heteroscedasticity	Breusch-Godfrey-Pagan	0.5227	Homoscedastic	0.9012	Homoscedastic
Serial correlation	Breusch-Godfrey	0.3251	No serial correlation	0.8753	No serial correlation
Model specification	Ramsey RESET test	0.2845	Functional form correct	0.3321	Functional form correct

5. CONCLUSION AND RECOMMENDATIONS

The primary objective of the study was to analyse the relationship between the level of economic globalisation, social expenditure and tax revenue within the South African economy. In doing so, the study aimed to test the compensation and efficiency hypotheses which aim to explain the dynamics between economic globalisation and government size. Results in this regard seem to lend credence to the efficiency hypothesis in South Africa. While economic globalisation has brought with it various advantages, it does hold important fiscal implications. Among the most telling of these has been the consequences that competitive international capital markets coupled with a high tax burden have induced. Higher capital mobility has seen large outflows that have consequently increased pressure on tax revenue. For the South African economy, characterised with a large welfare state, this raises various concerns. Not only does economic globalisation impact fiscal income, but it likewise plays a major role in expenditure objectives.

With all of this in mind, it seems as though fiscal policy has been thrust into a vicious cycle. With debt increasing at concerning rates, expenditure decisions have been complex with limited spending either directed between retaining capital or maintaining social conditions. Henceforth, strategies that need to be proliferated must include advancing fiscal consolidation and policy certainty, while likewise implementing structural reforms to facilitate inclusive growth. Moreover, FDI inflows need to be directed towards assisting government's investment projects with a strategic focus on enhancing local development. While the study has afforded significant insight it has not been without its limitations. These have primarily revolved around the sample size and the limited timeframe of the investigation. Future research, therefore, needs to focus on the use of panel data methodologies that seek insight into more sub-Saharan regions. Furthermore, studies should aim at comparing the different dimensions of globalisation and their impact on public sector composition.

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