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An analysis on the key Macroeconomic drivers of consumer vulnerability in the South African economy

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ABSTRACT

A country's middle class and its associated consumption power play a significant role in its progress towards economic development. Consumers have the ability to foster an accumulation of human capital, savings and induce an expansion of domestic markets. Despite this inherent potential, South African consumers, over the last decade, have illustrated subdued expenditure patterns, facing high levels of debt and uncertainty in employment and income which point to a large degree of consumer vulnerability. The primary objective of this study was to identify the key macroeconomic drivers that have contributed to this position. A quantitative research approach through the use of quarterly time series data from 1995Q1 to 2018Q4 was used whilst an autoregressive distributed lag (ARDL) model was employed. The results provide a comprehensive outlook on the macroeconomic drivers that have contributed to the vulnerable position of many South Africans. Amongst the most telling, specifically in the short run, include inflation and unemployment levels. Results further revealed that interest rate changes, low economic growth as well as concerning fiscal sustainability measures induced significant long term consequences. Together with the causality analysis, the findings illustrate a vicious cycle of an unhealthy consumption climate. The continued deterioration of consumption patterns signifies the existence of structural barriers, restricting consumers' contribution towards a more inclusive growth climate. Addressing this aspect therefore requires a multipronged approach including innovative labour market reforms, the promotion of political stability and a more flexible monetary framework that can assist in achieving long-term economic growth.

Key phrases

ARDL; consumer vulnerability; fiscal policy; monetary policy and South Africa

JEL Classification: E21, E52, E62

1. INTRODUCTION

Consumers and their ability to actively contribute economically have undoubtedly been amongst the most important determinants in country's pursuit of economic development (Bagautdinova, Hadiullina, Nugumanova, Averyanov & Novenkova 2014:588). In fact, throughout history, their role as economic agents in generating income and effectively distributing resources have been pivotal drivers in the accumulation of both human and social capital, the establishment of sound and integrated financial sectors and ultimately, throughout these processes, the construction of diversified economic markets (Chun, Hasan & Ulubasoglu 2011:4). This however has been, to a large extent, dependent on the financial wellbeing of these economic agents. Sound financial positions of consumers and families as production units influence a range of activities, both socially and economically. From a macroeconomic perspective this has primarily revolved around savings, investment, consumption and more importantly the growth in a country's middle class (Kharas 2017:2). Whilst on a more microeconomic level the financial wellbeing of households likewise infers various implications, impacting not only spending decisions, but extending to choices surrounding migration, the attainment of education and even the size of the household (Le Bris 2015:4).

With the aforementioned in mind, it is clear that a financially stable position of a country's household sector holds special relevance for both policymakers and stakeholders alike. Despite this recognition, the growth and trends of globalisation, especially over the last decade has made countries more susceptible to economic instability which has closely associated with the increasing prevalence of financial vulnerability in the global society (Aikman, Lehnert, Liang & Modugno 2016:8). The unprecedented growth in the levels of consumer credit and debt since the early 1990s has not only raised concerns but prompted substantial economic and sociological ramifications for financial institutions and economies at large (Lander 2016:306). The 2008 Global Recession additionally highlighted a worsening in the economic circumstances of households, where an increasing number of consumers are even, still today, struggling to make ends meet while at the same time are confronted with mounting debt obligations which they are unable to repay (Anderloni, Bacchiocchi & Vandone 2012:284). More consumers around the world have leaped into the gloomy world of debt burdens, unemployment and almost non-existence of savings.

According to Brown, Ghosh and Taylor (2014:285) this has exposed many households in a number of countries to financial vulnerability and stress, while holding on to limited savings in the midst of financial difficulties. What the Global Recession emphasised was the importance of observing consumer vulnerability not only from a macroeconomic perspective, yet in addition at the individual dimension (Bańkowska, Honkkila, Pérez-Duarte & Lefebvre 2017:1). This had once again emphasised the importance of understanding consumer vulnerability. According to Ampudia, van Vlokhoven and Zochowski (2016:251) examining the vulnerabilities of consumers is significant due to the fact that vulnerable consumers represent a danger to financial stability given their interconnected nature to the financial sector. At the same time, given that wealth is a standout amongst the most essential factors that have an influence in household consumption over its lifecycle, consumption choices are affected by a consumers' credit worthiness, affecting economic activity. It is against this background, that this study seeks to investigate the macroeconomic factors that drive consumer vulnerability within a developing context. In doing so, it aims to add to the underlining knowledge surrounding the subject and furthermore, provide possible recommendations for South African policymakers to address this growing concern.

2. LITERATURE REVIEW

A tight consumer space regularly establishes itself in an undesirable and vicious economic cycle which impacts the overall economy. For instance, according to Momentum (2017:4) the worsening of consumer vulnerability places enormous pressure on income tax revenue, which fuels governments' fiscal deficit. This consequently has a negative impact on the exchange rate, forcing it to depreciate, an effect that will fuel pressure on the CPI (inflation rate), further worsening consumer vulnerability. This makes consumer vulnerability a multifaceted phenomenon which goes beyond a consumers' ability to repay their debt obligations. According to Anderloni *et al*. (2012:286) a consumer is vulnerable *"if they are exposed to adverse shocks such as employment loss, reduction in working hours, death, illness that can eliminate or reduce an income source and/or determine unexpected liabilities and negatively impact their financial situation".* O'connor, Newmeyer, Wong, Bayuk, Cook, Komarova, Loibl, Ong and Warmath (2018:2) see consumer vulnerability as the likelihood that an individual will encounter financial adversity or poverty, preventing them from maintaining their standards of living. It describes a households' capacity to recuperate from unexpected financial shocks, including a sudden loss of income due to unemployment or an upsurge in spending as a result of exogenous factors (Abid & Shafiai 2018:32).

The theoretical economic basis for consumption, saving, and indebtedness choices has grown overtime, particularly within the Absolute Income Hypothesis (Keynes 1936) and the Life-Cycle theory (Modigliani & Brumberg 1954). Milton Friedman (1957) also highlighted on these household economic decisions in the Permanent Income Hypothesis. The theory as advocated by Keynes who contends that consumption depends on the consumers' current income. This infers that the consumers' inclination to spend, thereby, consume will facilitate economic growth, however, could bring about adverse effects for their individual finances, especially if they earn lower incomes, giving rise to low savings levels, or if they continually finance their increased spending/consumption through credit received from financial institutions (Keynes 2008:26). Subsequently, as argued by Vandone (2009:8), rather than smoothing their consumption as proposed by the Life-Cycle model, consumers forfeit their savings which may lead to being financially vulnerable.

Contrariwise, the Life-Cycle theory point out that a consumer chooses to borrow to finance consumption based on the anticipation of increased future income. Within this context, both indebtedness and savings ensure increased economic welfare by eventually smoothing out consumption (Ando & Modigliani 1963:76). Thus, households that expect a higher future income growth will inevitably have a higher level of borrowing; increasing their chances of being vulnerable overtime should the high income expectation not come forth (Moroke 2014:454). Friedman (1957:3) additionally varied from Keynes, in the view that households' consumption depends on the income it expects to earn in future, indicating that consumers were more worried about their consumption over the long-run than their current income. Thus, from the aforementioned theories, it is obvious that, from however way one looks at it, household behavioural tendencies relating to consumption and savings are a component of their income and access to credit (de Clercq, van Tonder & van Aardt 2015:117).

Numerous factors contribute to consumer vulnerability. In most instances, consumers are not cognisant of their vulnerability, showing divergence between a consumers' impression of their financial state and their definite financial situation (O'Connor *et al*. 2018:1). Indebtedness is viewed as one of the elements that drive consumer vulnerability. As maintained by Bank Negara Malaysia (2013:57), household debt is comprised of secured (e.g. mortgages and vehicle loans) and non-secured debt (e.g. credit cards, overdraft facilities and personal loans). While household debt plays a fundamental role towards economic growth, unsustainable borrowing which causes households to attain very high debt levels in comparison to current and future earnings capacity are harmful to the economy since they may prompt higher default rates (Khan, Abdullah & Samsudin, 2017:290). Brown

et al. (2014:291) contends that struggling to pay for things accumulated through credit possibly implies falling into arrears, which at that point adds more to what must be paid in the next period, continually resulting in a debt spiral, and consequently persisting financial problems. The high level of household debt generates vulnerabilities which are not limited to the economy; additionally it negatively affects financial stability (Charpe & Flaschel 2013:60).

At macroeconomic level, an increasing unemployment rate raises the likelihood of consumer vulnerability, failing to pay monthly obligations (Ampudia *et al*. 2016:251). This is especially being true for those residing in areas with poor economic activity and a low concentration of employment prospects (Brown *et al*. 2014:293; The Bureau of Market Research 2014:14). Nevertheless, the relationship between debt and income is found to be positive, such that when incomes increase, the aggregate of debt level also rises (del Rio & Young 2006:5). This relationship according to Khan *et al*. (2017:296) and Duca and Rosenthal (1993:15) is expected on the grounds that higher income and more wealth raises debt limits and in this way may by implication intensify their demand for loans. This view is confirmed by de Clercq *et al*. (2015:134) that consumers who have sufficient savings and a high income from employment, do not encounter challenges in meeting their daily needs and have low debt-servicing burdens, and as a result are more likely to be financially secure.

From a monetary policy perspective, decisions by the central bank on credit have a two-way effect on consumers. In particular, an interest rate shock impact household vulnerability through the increase of debt payments and furthermore through the increase of income received from interest-earning (Ampudia *et al*. 2016:253). With the increase in interest rate, the borrower will pay more from their income which may affect their ability to repay the loan (Dey, Djoudad & Terajima 2008:50). Inflation and adverse economic conditions are also identified as possible factors inducing the feeling of being financially vulnerable (Van Aardt, Moshoeu, Risenga, Pohl & Coetzee 2009:2). An increase in inflation reduces the value of money and thereby raises the cost of borrowing (Mohr 2015:268).

Consumer vulnerability is likewise influenced by factors other than debt, such as life-style behaviours (bad financial management) which according to Anderloni *et al*. (2012:294) are either due to negligence or imprudence, resulting in unmaintainable expenses. Low income likewise, increases the probability of being identified as vulnerable. In response to low wages, households acquire debt as a form of wage substitution (Barba & Pivetti 2008:113). Non-labour income which includes transfer payments such as social grants and benefit income is seen as one of the key drivers of consumer vulnerability (The Bureau of Market Research 2014:21). In most instances, low income households are the largest recipients of

these kinds of income, hence according to Brown *et al*. (2014:293) and Abid and Shafiai (2018:42), recipients of such kinds of income are prone into falling into financial difficulties. Also, contrary to the views of Giordana and Ziegelmeyer (2017:7) low-income households are typically linked to precarious jobs which are not secure such a seasonal and contract based jobs where earnings are uncertain.

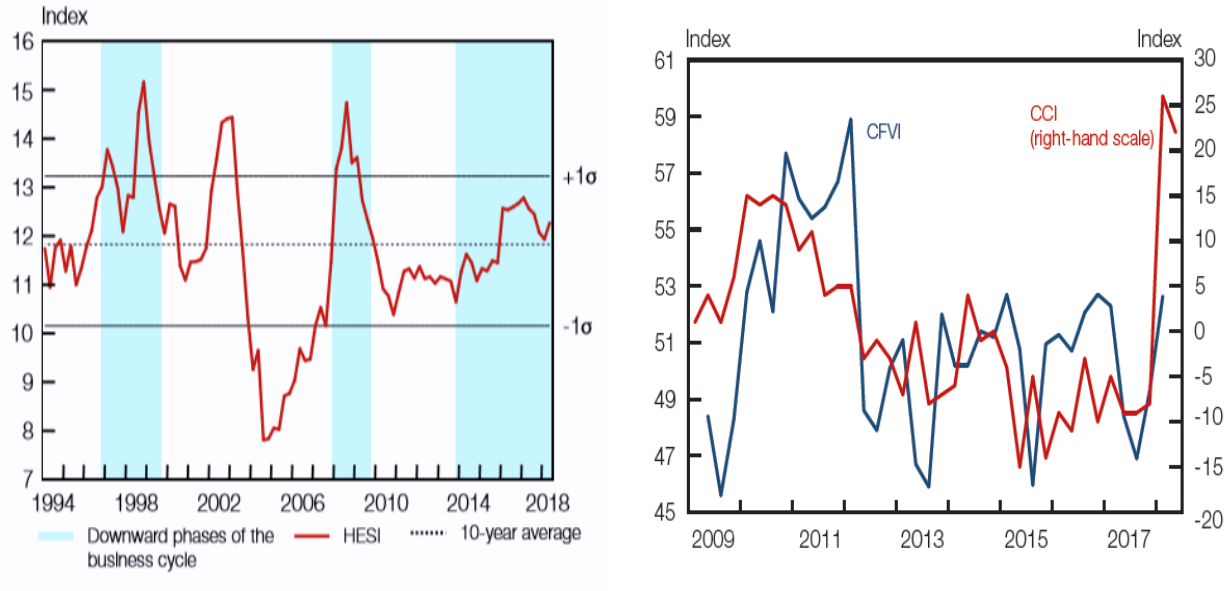
In accordance with the global trend, South Africa is also seeing a rise in consumer vulnerability with a few macroeconomic indicators pointing to high consumer financial vulnerability. These entail a relatively high debt-to-income ratio (rising at a faster pace than disposable income) and declined consumer confidence; particularly in as far as economic expectations are concerned. Although household disposable income has been rising at a faster rate since the aftermath of the 2009 Global Recession and the final years of the Zuma administration when it was at a far depressed pace (South African Reserve Bank (SARB) 2018:18), consumption spending has been quite supressed, rising at a slow pace relative to the growth in disposable income (SARB 2019:Internet). The rise in these household debt measures implies that households have become to a certain degree more vulnerable, raising some distresses about their ability to service this debt in the future (SARB 2018:20). A large share of South African consumers is still facing challenges of earning sufficient income, purchasing necessities, meeting their debt obligation while at the same time still saving (Momentum 2017:2) given the country's high unemployment levels and poverty rates (Statistics South Africa (Stats SA) 2017:14).

Households who combine high-debt-to-income ratios are highly sensitive to many kinds of shocks (Bańkowska, Lamarche, Osier & Pérez-Duarte 2015:15), suggesting that the debt-repayment ability of households weakens. Household debt as a percentage of GDP has averaged at high rates (currently at 33.00%) when compared to its BRICS counterparts such as India (11.20%), Russia (16.50%), Brazil (26.70%) while personal savings are significantly low at 0.2 percent (in the last quarter of 2018) from -2.4 percent in the last quarter of 2016 (SARB 2019:Internet). Growth in total household debt has also been increasing since 2017, with instalments on sale credit and credit card advances taking up a large share compared to other kinds of household debt (SARB 2018:20).

A highly indebted household sector is a cause for concern as it could be particularly sensitive to shocks in the economy. This pressure on consumer finances is also an indication that company profits will be under pressure, consequently implying less than expected company tax revenue for the government, an increasing possibility of worker retrenchments and a higher unemployment rate (Momentum 2017:5). Figure 1 below

provides an overview of the vulnerability of consumers in South Africa since the beginning of 2009 and 2018. Consumers have been extremely vulnerable from 2012, being very exposed during 2015 and 2017.

Figure 1: Consumer financial vulnerability (a) and household economic stress (b) indices (1994 - 2018)



(a) ***(b)***

Note: ** CFVI 10-20 means 'financially very vulnerable', 20-39.9 'financially vulnerable', 40-49.9 'financially very exposed', 50-59.9 'financially mildly exposed', 60-79.9 'financially secure' and 80-100 'financially very secure'.

Source: SARB (2018:22)

According to Momentum (2017:4), a number of political and economic realities have been very strong contributors to the country's negative economic environment and increasing levels of consumer vulnerabilities including a perceived lack of action from government to address corruption and looming credit rating downgrades due to the perception that government is not doing enough to address the concerns of ratings agencies. These uncertainties negatively impacted business confidence and their propensity to invest and spur economic growth, employment and an improved consumer space. The decline in consumer vulnerability in the second quarter of 2018 was also mainly as a result of the increased Value Added Tax (VAT) rate from 14 to 15 percent, which caused a decline in the consumption of durable goods (SARB 2018:29).

According to BusinessTech (2018:9), South Africas' sluggish economic environment (below 2% growth rates) has put too much pressure on household finances, while at the same time, households have shown poor financial planning and budgeting skills, seeing them live beyond their means. According to Smith (2018:14) a high unemployment rate also fuelled higher levels of uncertainty regarding job and income security, and dampened the outlook for new employment opportunities. The decline in the household economic stress index since 2016 (see Figure 1b) and improving CFVI suggests that the financial conditions of South African households are slightly improving. An increase in the HESI implies a stressed household sector, and as can be seen in Figure 1b, consumers are more financially stressed and vulnerable during weak economic activity like during the 1998/1999 Asian Economic Crisis and the 2008/09 Global Recession. Hence relative to these periods, the HESI from 2014, is somewhat lower but still indicates concerning levels.

With all of this in mind, the recent global financial woes have resulted in unprecedented interest in the household sector, and as such, several studies have been done on the issue of consumer vulnerability. In a study that investigated household financial vulnerability in Italy, Anderloni *et al*. (2012:293) found financial vulnerability to be positively related to debt servicing levels, with the impact being more for households with consumer credit (i.e. unsecured debt). Consumer economic outlook in all countries under review was found to be influenced by the GDP growth rate, income distribution, real disposable income, unemployment rates, inflation and household debt levels, as well as other non-economic elements such as consumer attitudes towards finances. A similar study evaluating household credit risk found other individual facts including the number of household dependents and employment status of the household head to affect household financial vulnerability (Holló & Papp 2007:5). Böheim and Taylor (2000:1), in their study which was examining evictions and repossessions in Britain, found the regional unemployment rate to be a significant influence on the probability that households will be financially vulnerable, with high unemployment rates being positively related to the probability of defaulting from their financial obligations. Similar findings are also reported by Fuenzalida and Ruiz-Tagle (2010:320) in Chile.

It is identified in de Clercq *et al*. (2015:133) that price increases, the prime interest rate, unemployment, consumer liabilities relative to influence consumer vulnerability in South Africa. Another study in South Africa by The Bureau of Market Research (2014:29) which was analysing consumer financial vulnerability found the strongest predictors of financial vulnerability to be low incomes, living in a comparatively poorer province, living in a rural

area, being divorced, having little education, being employed part-time or being unemployed and receiving a social grant. In their study which investigated the household debt burden and financial vulnerability in Giordana and Ziegelmeyer (2017:20) after controlling for other factors, found that low income or low wealth increase the probability of being identified as vulnerable. Moreover, using the autoregressive distributed lag (ARDL) modelling approach to examine factors that determine household financial vulnerability in Malaysia, Abid and Shafiai (2018:41) find that debt, prices of goods, interest rate and unemployment have a positive long-run relationship with household financial vulnerability, while GDP per capita has a negative relationship, indicating that with the decrease in household income, the chances of household vulnerability increases.

3. RESEARCH METHODOLOGY

3.1 Data and sample period

In conducting the research, a quantitative research approach was adopted by making use of secondary time series data, where a functionalist research paradigm served the philosophical base of the study. The sample period ranged from 1995Q1 to 2018Q4 and was primarily based on quarterly observations. As such, the final sample size consisted of a total of 96 observations. Considering that the study had the primary objective to determine the key macroeconomic variables of consumer vulnerability within the South Africa context a total of seven identified macroeconomic variables were selected that served as independent regressors in the model.

Selections of these variables were based on a comprehensive literature and empirical review. As a means of measuring consumer vulnerability, Quantecs' consumer vulnerability index was utilised. The composite index consists of nine different constituent variables including aspects such as employment growth, real credit growth, insolvency growth, debt servicing costs, real house price growth, saving to household disposable income, household debt to disposable income ratio and debt to financial asset ratio and real household disposable income growth (all equally weighted). All of the included variables with their corresponding measures and sources are shown in Table 1.

Table 1: Variable description and data source identification

Variable	Measure	Data base
Consumer vulnerability index (CV)	Index ranging from 0 – 100. Lower scores indicate higher degree of vulnerability.	Quantec
Economic growth (ECON)	GDP per capita (constant prices)	SARB
Consumer price inflation (CPI)	CPI index	SARB
Real effective exchange rate (EXCH)	Real effective exchange rate	SARB
Fiscal expenditure (FE)	FE as % of GDP	SARB
Taxation revenue (TAX)	Tax revenue as % of GDP	Quantec
Interest rate (INT)	Repurchase rate (%)	SARB
Unemployment rate (UN)	Narrow unemployment rate (%)	Quantec

Source: Authors' own construction

3.2 Model description

In conducting the analysis and dynamics between the selected variables, the study employed an autoregressive distributed lag (ARDL) model. The model was chosen based on its ability to provide accurate and robust results even when selected sample sizes or range of observations are small. Over and above this feature, the model offers sufficient scope for analysing variables that are integrated at different levels as opposed to Johansen and Juselius' (1990:169) co-integration model which requires the included variables to be stationary at I(1). The model that was employed in the current study is presented as follows:

$$\Delta LCV = \phi_0 + \sum_{j=1}^{k} \eta_j \Delta LCV_{t-j} + \sum_{j=1}^{k} \alpha_j \Delta LCPI_{t-j} + \sum_{j=1}^{k} \beta_J \Delta LECON_{t-j} + \sum_{j=1}^{k} \gamma_j \Delta LEXCH_{t-j} + \sum_{j=1}^{k} \delta_j \Delta LFE_j$$
$$+ \sum_{j=1}^{k} \varepsilon_j \Delta LINT_{t-j} + \sum_{j=1}^{k} \theta_j \Delta LTAX_{t-j} + \sum_{j=1}^{k} \pi_j \Delta LUN_{t-j} + \omega_1 \Delta LCV_{t-1} + \omega_2 \Delta LCPI_{t-1} + \omega_3 \Delta LECON_{t-1}$$

$$+ \omega_4 \Delta LEXCH_{t-1} + \omega_5 \Delta LFE_{t-1} + \omega_6 \Delta LINT_{t-1} + \omega_7 \Delta LTAX_{t-1} + \omega_8 \Delta LUN_{t-1} + \mu_t \quad (1)$$

……..

here ΔLCV refers to the change in the natural logarithm of the consumer vulnerability index, ΔLCPI refers to the change in the natural logarithm of the consumer price index, ΔLECON to the change in the natural logarithm of gross domestic product per capita, ΔLEXCH to the change in the natural logarithm of the real effective exchange rate, ΔLFE to the change in the natural logarithm of fiscal expenditure levels, ΔLTAX to the change in the natural logarithm of tax revenue levels, ΔLINT to the change in the natural logarithm of real interest rate, ΔLUN to the change in the natural logarithm of the broad unemployment rate and μ_t the error term. In addition, k denotes the number of lags included in the model while $\eta_j, \alpha_j, \beta_j, \gamma_j, \delta_j, \varepsilon_j, \theta_j, \pi_j$ represents the short run dynamics and $\omega_1, \omega_2 ... \omega_n$ shows the long run coefficients. Based on this equation, the following hypotheses were set in order to test if the included variables in the model do co-integrate:

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

Alternative hypothesis (H_1): Co-integration present between the variables

By testing these hypotheses, the bounds test for co-integration was utilised. The test makes use of a calculated F-statistic which is subsequently compared to the upper and lower bound critical values derived by Pesaran, Shin and Smith (2001). In the event that the estimated F-statistic does not exceed the upper and lower bound critical values the null hypothesis for no co-integration cannot be rejected. Taking this into consideration the estimated F-statistic is found to exceed both the lower and upper bounds, the null hypothesis is subsequently rejected and serves as indication that the variables do in fact co-integrate. Subsequently, if there does exist a long run relationship between the variables, the following step should entail the estimation of an error correction mode (ECM). This particular model is derived from the following equation:

$$\Delta LCV = \phi_0 + \sum_{j=1}^{k} \eta_j \Delta LCV_{t-j} + \sum_{j=1}^{k} \alpha_j \Delta LCPI_{t-j} + \sum_{j=1}^{k} \beta_j \Delta LECON_{t-j} + \sum_{j=1}^{k} \gamma_j \Delta LEXCH_{t-j} + \sum_{j=1}^{k} \delta_j \Delta LFE_{t-j}$$
$$+ \sum_{j=1}^{k} \varepsilon_j \Delta LINT_{t-j} + \sum_{j=1}^{k} \theta_j \Delta LTAX_{t-j} + \sum_{j=1}^{k} \pi_j \Delta LUN_{t-j} + \vartheta ECT_{t-1} + \mu_t$$
..... (2)

Where ECT_{t-1} shows the error correction term and ϑ denotes the coefficient of the error correction term which indicates the speed of adjustment back towards equilibrium. If any form of co-integration does exist between the variables this implies the presence of causality, either from one direction to the next or emanating from both directions. For the purpose of this study towards analysing the causality between the variables, the Toda-

Yamamoto approach to granger causality will be utilised. This approach was primarily selected based on the ability to accurately analyse casual relations when the variables are integrated of different orders. The model makes use of a modified Wald test statistic together with an unrestricted regression with the purpose of testing whether the included variables' coefficients lagged values are zero. If the latter is found, it is indicative that no casual links exist, however if these lagged values are not equal to zero it suggests otherwise.

4. RESULTS AND DISCUSSION

4.1 Correlation analysis

The initial step in the analysis comprised a correlation analysis between the variables. This analysis was chosen with the purpose to ascertain a simplistic view on the relationship inherent between the dependent and independent variables. Table 2 below indicates the results for the correlation analysis. From the table, it shows that there exist weak to medium positive and significant associations between the consumer vulnerability index and levels of fiscal expenditure (*sig. = 0.0027*), tax revenue collection (*sig. = 0.0009*) as well as economic growth (*sig. = 0.0022*). On the other hand, the relationships between the LCV and LCPI and LEXCH were considered to be negatively weak and non-significant. These negative associations were also estimated between LCV and LUN as well as LINT; however these exuded a somewhat stronger and more significant association.

Table 2: Correlation analysis between LCV and all independent variables

Variables	LCV	LCPI	LEXCH	LFE	LTAX	LINT	LUN	LECON
LCV	1.000000 -----							
LCPI	-0.144655 (0.1642)	1.000000 -----						
LEXCH	-0.073873 (0.4792)	-0.425127 (0.0000*)	1.000000 -----					
LFE	0.305815 (0.0027*)	0.465979 (0.0000*)	-0.054528 (0.6017)	1.000000 -----				
LTAX	0.335626 (0.0009*)	0.660003 (0.0000*)	-0.369978 (0.0002*)	0.127275 (0.2215)	1.000000 -----			

Variables	LCV	LCPI	LEXCH	LFE	LTAX	LINT	LUN	LECON
LINT	-0.301272 (0.0032*)	-0.775978 (0.0000*)	0.440521 (0.0000*)	-0.421596 (0.0000*)	-0.438088 (0.0000*)	1.000000 -----		
LUN	-0.307814 (0.0025*)	0.548765 (0.0000*)	-0.507579 (0.0000*)	0.078720 (0.4507)	0.327547 (0.0013*)	-0.271359 (0.0082*)	1.000000 -----	
LECON	0.312488 (0.0022*)	0.956261 (0.0000*)	-0.308915 (0.0025*)	0.470646 (0.0000)	0.684341 (0.0000*)	-0.759356 (0.0000*)	0.369813 (0.0002*)	1.000000 -----

Note: ( ) indicates p-values; * denotes significance at 1% significance level

Source: Results obtained from Eviews output

4.2 Unit root testing

With the purpose of ensuring the applicability of the use of the ARDL model in the analysis, each variable was subject to unit root testing. In this regard, the Augmented Dickey Fuller (ADF) unit root tests were applied. The results for the tests are depicted in Table 3. As shown from the table, out of the eight included variables in the study, six attributed a unit root at level while two (LINT, LUN) were found to be stationary. Further results revealed that when estimated at first difference with intercept the natural logarithms for consumer vulnerability, real effective exchange rate, GDP per capita, consumer price index, fiscal expenditure as well as tax revenue all were found to be stationary, meaning that they are I(1). This therefore, confirmed that all included variables were not integrated of the second order and that the use of the ARDL model was applicable for the analysis of both the long- and short-run relationships for the variables under consideration.

Table 3: Unit root test results

Var.	Levels				1st difference				Result
	Intercept		Trend & intercept		Intercept		Trend & intercept		
LCV	-2.2825	0.1798	-2.2962	0.4315	-10.487	0.0000*	-10.429	0.0000*	I(1)
LEXCH	-2.6424	0.0883	-2.6477	0.2608	-9.0581	0.0000*	-9.0208	0.0000*	I(1)
LGDP	-1.1439	0.6954	-1.1734	0.9096	-5.5765	0.0000*	-5.6267	0.0000*	I(1)
LCPI	-1.0314	0.7393	-2.9325	0.1575	-6.8097	0.0000*	-6.8594	0.0000*	I(1)

LINT	-2.2443	0.1924	-4.1735	0.0072*	-6.9997	0.0000*	-6.9648	0.0000*	I(0)
LFE	-0.7819	0.8190	-1.4075	0.8523	-4.1926	0.0012*	-4.2554	0.0057*	I(1)
LTAX	-1.9350	0.3150	-2.7351	0.2255	-15.462	0.0001*	-15.401	0.0000*	I(1)
LUNR	-3.1636	0.0254**	-3.1737	0.0961	-10.809	0.0000*	-10.850	0.0000*	I(0)

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

Source: Results obtained from Eviews output

4.3 ARDL bounds testing and long-run analysis

Subsequent to unit root testing and confirmation on the use of the specified model, the ARDL bounds test was utilised in order to determine if there exists co-integration (long-run relationship) amongst the included variables under investigation. Results for the test are depicted in Table 4 below. As shown, the estimated F-statistic for the Wald-test approximated to 5.455. This in fact exceeds both the lower (*I0 = 2.73*) and upper (*I1 = 3.9*) bound critical values even at 1% significance level. Henceforth, this implies the rejection of the null hypothesis as shown in Section 3.2 and suggests the existence of a long run relationship between the levels of consumer vulnerability in South Africa and the selected macroeconomic variables.

Table 4: ARDL Bounds test results

Test Statistic	**Value**	**k**
F-statistic	5.455636	7
Critical value bounds (Sig.)	**I0 Bound**	**I1 Bound**
10%	1.92	2.89
5%	2.17	3.21
2.5%	2.43	3.51
1%	2.73	3.90

Source: Results obtained from Eviews output

Given the existence of co-integration, Equation 3 below provides a view of the nature of the relationship between each of the selected independent variables and the consumer vulnerability index. From this equation, it seems that the consumer vulnerability index was

positively associated with higher income levels, currency appreciation, fiscal expenditure and also tax revenue improvements. These findings tend to resonate with those presented by Abid and Shafiai (2018:39) as well as Giordana and Ziegelmeyer (2017:14). On the other end of the spectrum, inflation levels, real interest rates and unemployment all seem to have negative associations with the index. This suggests that stricter monetary policy decisions, consumer price inflation as well as the prominence of a lack of employment all directly contribute towards driving higher financial vulnerability levels amongst South African households in the long-run.

These findings tend to infer that aggregate price increases exert somewhat of a substantial expenditure pressure on South African consumers with every one percent increase in inflation increasing consumer vulnerability with 0.441 percent (de Clerq *et al*. 2015:128). More concerning though, as shown by the findings, is that conventional monetary policy responses (repo rate adjustments) to the latter seem restricted. In fact, the negative association as shown in Equation 3 suggests that further interest rate increases (in response to inflationary pressures) would bring about further debt servicing concerns for households.

$$LCV = 1.553 - 0.441LCPI + 0.375LECON + 0.321LEXCH + 0.343LFE - 0.292LINT + 0.577LTAX - 0.179LUN \quad \text{.....(3)}$$

4.4 Error correction model (ECM) and short-run relationships

Subsequent to the long-run analysis the error correction model (ECM) was utilised to estimate the short-run dynamics between the variables. More specifically, the model was used to determine the speed of adjustment back to long-run equilibrium based on the changes in the independent variables. Results shown in Table 5 are dedicated to elucidate on the error correction term as well as the elasticity coefficients of all short-run relationships. From the depicted results, the error correction term CointEq (-1) is shown as negative and significant (at 1% significance level). This confirms that indeed there is robust evidence of error correction in the co-integrating relationship between the variables. Based on the ECT coefficient of -0.4165, the results suggest that 41.65 percent of the deviations from equilibrium are eliminated at each quarter interval. In other words, it infers that it takes approximately 2.4 quarters (1/0.4165) to restore equilibrium in consumer vulnerability when changes in the selected macroeconomic variables are taken into consideration.

Table 5: Error Correction model and short run results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPI)	-2.459560	0.755888	-3.253867	0.0018*
D(LCPI(-1))	-0.747498	0.762401	-0.980453	0.3303
D(LCPI(-2))	-2.336566	0.702228	-3.327361	0.0014*
D(LCPI(-3))	-1.267175	0.723813	-1.750693	0.0845***
D(LECON)	0.260237	0.254157	3.023923	0.0095*
D(LEXCH)	-0.027184	0.084388	-0.322125	0.7483
D(LFE)	0.156833	0.058717	2.670980	0.0095*
D(LINT)	-0.142028	0.134873	-1.053047	0.2960
D(LTAX)	0.469133	0.125246	3.745676	0.0004*
D(LTAX(-1))	-0.047275	0.137809	-0.343046	0.7326
D(LTAX(-2))	0.170795	0.132530	1.288730	0.2019
D(LTAX(-3))	0.246698	0.123061	2.004686	0.0490**
D(LUN)	-0.159125	0.121884	-1.305547	0.1961
D(LUN(-1))	-0.084944	0.120505	-0.704900	0.4833
D(LUN(-2))	-0.331714	0.121964	-2.719772	0.0083*
D(LUN(-3))	-0.313009	0.125655	-2.491015	0.0152**
CointEq(-1)	**-0.416566**	**0.068342**	**-6.095296**	**0.0000***

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

Source: Results obtained from Eviews output

Based on the short-run coefficients from Table 5, results show significant, highly responsive and negative relationship between consumer price increases and the vulnerability in South African households. Not only do present changes in price adjustments affect consumers but likewise past changes seem to have very elastic effects. Noteworthy from the results relating to unemployment levels and consumer vulnerability, is that lagged values as opposed to

current values were deemed significant (at 0.05 significance level) drivers of consumer vulnerability. This seems to confirm that longer durations of unemployment (*structural forms*) impose significant concerns for households by possibly imposing higher insolvency risks and likewise restricting their ability to generate surplus funds for saving purposes (Nichols, Mitchell & Linder 2013:4). Finally, coefficients relating to economic growth, fiscal expenditure and tax revenue all seem to confirm the positive associations (as shown in Equation 3) with the dependent variable in the long-run. With tax revenues as a percentage of GDP used as proxy for the tax burden in the study, the positive association amongst these variables might be indicative that governments' ability to collect tax highly depends on the vulnerable position of the consumers in South Africa.

4.5 Toda-Yamamoto granger causality analysis

Based on the confirmation of the co-integrating relationship in Section 4.3, it infers the possibility of at least one causal relationship between the dependent and independent variables under consideration (Granger 1988:202). As the study made use of indicators that presented a mixture of I(0) and I(1) variables, the Toda-Yamamoto (T-Y) approach to granger causality was utilised (Shrestha & Bhatta 2018:79). Results for the test are shown in Table 6 below. The evidence as shown infers a one-way causal relationship emanating from consumer price inflation towards consumer vulnerability in the short-run. Further significant (at 10% level of significance) one-way causal relationships were noted between the LCV and LINT (*sig. = 0.0881*) as well as LTAX (*sig. = 0.0989*) all emanating from inherent consumer vulnerability levels. The latter, in fact confirms the results presented in Section 4.4 and that indeed movements in consumer vulnerability does granger cause movements in the level of tax revenue collection. Finally, the results also inferred a two-way causal relationship between economic growth and consumer vulnerability. Henceforth, this shows and likewise confirms the interdependency amongst these factors.

Table 6: Toda - Yamamoto causality results

Excluded lags	Dependent variable							
	LCV	**LCPI**	**LECON**	**LEXCH**	**LFE**	**LINT**	**LTAX**	**LUN**
LCV	-------	4.4395 (0.2177)	8.9496 (0.0301*)	0.5637 (0.9047)	0.0533 (0.9968)	6.5391 (0.0881***)	6.2758 (0.0989***)	0.5167 (0.9152)
LCPI	7.8445	-------	14.1673	3.9389	2.5666	8.9348	1.8595	4.2374

Excluded lags	Dependent variable							
	LCV	LCPI	LECON	LEXCH	LFE	LINT	LTAX	LUN
	(0.0493*)		(0.0027*)	(0.2681)	(0.04634*)	(0.0302*)	(0.6021)	(0.2369)
LECON	7.7579 (0.0498*)	0.6991 (0.8734)	-------	2.0191 (0.5684)	9.5601 (0.0227*)	3.1999 (0.3618)	7.7365 (0.0518***)	8.9956 (0.0289*)
LEXCH	2.9062 (0.4063)	5.6759 (0.1285)	18.4585 (0.0004*)	-------	1.5472 (0.6714)	15.143 (0.0017*)	11.3446 (0.0100*)	2.8464 (0.4159)
LFE	8.6360 (0.0345*)	0.8959 (0.8264)	1.2377 (0.7440)	2.7217 (0.4366)	-------	3.0812 (0.3793)	4.1671 (0.2440)	3.0384 (0.3857)
LINT	0.2972 (0.9605)	1.3011 (0.7289)	9.3530 (0.0249*)	3.2453 (0.3553)	3.4195 (0.3313)	-------	5.6450 (0.1344)	3.1925 (0.3629)
LTAX	3.3775 (0.3370)	2.7697 (0.4285)	2.8798 (0.4105)	4.4308 (0.2185)	12.2953 (0.0064*)	1.3779 (0.7107)	-------	2.5500 (0.4663)
LUN	0.5887 (0.5887)	8.2416 (0.0346*)	1.1798 (0.7578)	1.2753 (0.7350)	0.6234 (0.6234)	1.0484 (0.7895)	13.9875 (0.0029*)	------

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

Source: Results obtained from Eviews output

4.6 Diagnostic and stability tests

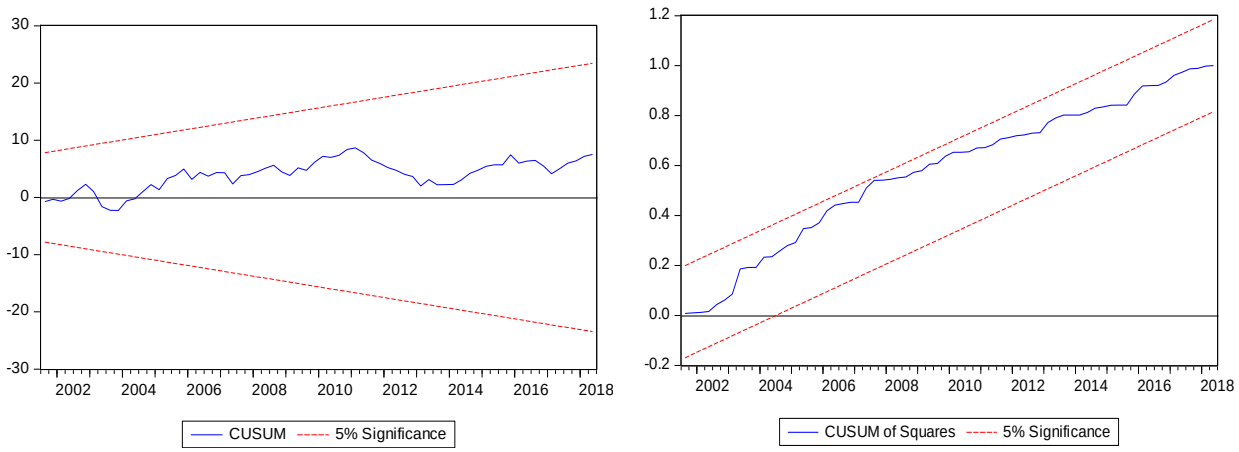
With the purpose to ensure the robustness of the results from the models that were utilised various diagnostic and stability tests were applied for which results are shown in Table 7 and Figure 2 below. The low test statistics estimated for the Jarque-Bera normality test (*t-stat. = 0.5548*), Breusch-Godfrey-Pagan heteroscedasticity test (*t-stat. = 0.9682*) as well as the LM serial correlation test (*t-stat. = 0.0475*) suggest that none of the null hypotheses (as shown in Table 7) could be rejected, even at 10% significance level. This confirmed that all residuals were normally distributed and the included variables were homoscedastic with no serial correlation present.

Table 7: Diagnostic test results

Test	Null hypothesis (H_0)	Tests statistic	p-value	Results
Jarque-Bera normality test	Normality in residuals	0.5548	0.7577	Do not reject H_0
Breusch-Godfrey-Pagan Heteroscedasticity test	No conditional heteroscedasticity	0.9682	0.5112	Do not reject H_0
Breusch-Godfrey Serial correlation LM test	No serial correlation	0.0475	0.9536	Do not reject H_0

Source: Results obtained from Eviews output

Figure 2: CUSUM and CUSQ stability estimates



Source: Results obtained from Eviews output

In addition to the aforementioned diagnostic estimates, both the cumulative sum (CUSUM) and CUSUM-of-squares (CUSQ) stability measures were utilized for the purpose of assessing model stability. Results for the models are shown in Figure 2 above. Both figures showcase the graphical plots within the 0.05 critical boundaries which confirm that the models maintained parameter stability throughout the sample period. This suggests that the models were dynamically stable and that any economic shocks during the sample period did not affect the relationship between the variables.

5. CONCLUSION AND POLICY RECOMMENDATIONS

The study had the primary focus of identifying the major macroeconomic drivers contributing to the underlining vulnerability levels in South Africa. From the results as presented it is clear that a range of exogenous factors impose strain on consumers' ability to cope with future

adverse economic shocks as well as maintaining their current standards of living. More specifically, the findings tend to suggest that especially inflationary price pressures as well as the underlining levels of fiscal expenditure play a large part in the financial well-being of South African households. This together with the causality analysis confirmed the vicious cycle consumer vulnerability imposes onto economic structures. From this perspective, as much as current economic conditions affect the wellbeing of consumers, the financial wellbeing of these economic agents' impacts both the social and economic performance of the country. From this point of view, when consumers become more financially vulnerable, this tends to infer lower levels of saving, investment, significant implications for tax collection and the quality of the institutional environment (Fatoki 2015:101).

This therefore infers various implications as well as significant challenges for both monetary and fiscal policy stakeholders. For the latter, spending and developmental objectives are largely influenced through its ability to generate necessary funding (Simkins 2016:28). Henceforth, higher vulnerability levels constrain the ability of fiscal policy to, ironically, mitigate these conditions and likewise improve their debt position. Similarly, monetary policies in the light of inflationary pressures are restricted. Whilst repo rate changes might reduce price pressures, it inadvertently will induce higher debt burdens on households (Owusu-Sekyere 2017:8). Add to this, a labour market characterised with long-term structural forms of unemployment and a volatile exchange rate for an economy largely exposed to external factors, improving the financial outlook of households proves a monumental task.

Based on these findings, the study therefore recommends that consumer vulnerability be approached with a multidimensional framework in mind. This must involve policy considerations with both macro- and microeconomic foci. From a macroeconomic perspective, policymakers need to proliferate strategies and actions that seek to address the current subdued and non-inclusive economic performance for the country. This must be coupled with more flexible labour market reforms, effective governance, prudent fiscal spending patterns as well as ensuring a conducive and stable exchange rate. On a more individual basis, financial literacy levels in the country need to be drastically improved through distributing knowledge and providing advisory investment platforms. In addition, more comprehensive debt management systems can be introduced together with incentivised savings schemes and effective wealth transfer procedures that assist financial decision making behaviour.

Whilst the study aims to contribute to the limited knowledge on the subject especially within the South African context, it is not without its limitations. These predominantly revolve around the quantitative nature of the inquiry. From this point of view, the study directed its focus towards comprehending the exogenous drivers of financial vulnerability of South African households affording limited insight on the more endogenous and individual determinants. Henceforth, future studies could include more qualitative approaches including the use of in-depth interviews as well as focus group studies to ascertain what drives vulnerability within household structures. Furthermore, comparative analyses with other developing countries could also be pursued with the aim to ascertain whether the occurrence of consumer vulnerability in these countries or regions possesses unique and context specific influences.

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