



## Analysis of Household Debt in South Africa Pre- and Post-Low-Quality Asset Financial Crisis

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### ABSTRACT

Many economies including South Africa experience high levels of debt. This paper analyses household indebtedness in South Africa from 2005Q1, a period where there was a massive escalation of asset prices, stock prices had gone up and house prices more than doubled to 2019Q4. This timeframe was chosen to identify the level of household debt prior to the 2007-2009 financial crisis, during, as well as after the recession and just before the COVID-19 pandemic spread globally from China. The variables used in the study comprised of the dependent which was household debt and independent variables were consumption, income, consumer price index, taxation and inflation. The VECM model and various diagnostic tests were employed to explain the variables. The Generalized Impulse Response Function (GIRF) were also utilized to look at the dynamic relations among the variables under investigation. There was a positive insignificant relationship between household debt and consumption, a negative insignificant relationship between the dependent variable and income, a positive significant relationship amongst household debt and consumer price index. From the findings, it was concluded that household debt in South Africa has in fact changed over the past 14 years with middle income households having to overcome the burden of their expenditure.

**Keywords:** Household Debt, Saving, Economic growth, Financial Crisis, Borrowing

**JEL Classifications:** F10, F40, I18

### 1. INTRODUCTION

Over the past centuries there have been numerous financial crises that have had catastrophic repercussions on economies all over the world. There has been an estimated 147 banking crises over a period of 41 years. One of them being the United States Subprime Lending Crisis, commonly known as the “mortgage mess” or “mortgage meltdown.” According to Duca (2013), the public became aware of the meltdown when an abrupt increase in home foreclosure of 2006 occurred and further increased in 2007. This led to a global financial crisis in a short time frame of a year. Since the 1980’s, the rise of the United State financial sector has led to a series of increasingly sever financial crises, each crises causing

more and more damage. For example, the Early-80s Recession which took place during July 1980 and November 1981 as well as the Dot-Com crash that was fuelled by the technology and internet shocks. In September 2008 the bankruptcy of the United State investment bank Lehman Brothers and the collapse of the world’s largest insurance company American International Group triggered a ticking time bomb which caused the world tens of trillions of dollars (Lacoviello, 2008). South Africa’s economy is one of the most integrated in the world meaning that it too would be hit by the 2008 financial crisis, the macroeconomic and microeconomic goals of the country were affected. South Africa has always struggled with high unemployment rate; the recession only magnified the dilemma. Economic growth was jeopardised

by the economy failing to operate at its maximum capacity. The current account deficit of the country started to increase and the household debt as a percentage of the Gross Domestic Product was plummeting. Because of the crisis and partly the natural disaster (floods) that hit South Africa in the beginning of 2007, the agricultural sector was floundering.

Consumers in South Africa make purchases despite the low rates of income and saving which is where debt comes into play. South Africans, like most civilians in other countries rely on credit to make their everyday transactions. The granting of credit plays a consequential role in any economy (Ssebagala, 2016). Credit can be granted in sundry forms and is customarily used to purchase extravagant items or as a short-term alleviation of cash flow. Without a system whereby debtors could borrow cash, it would be infeasible for most people to own assets such as cars and houses.

The lack of restrictiveness on the access to credit by financial institutions in South Africa has only made matters worse by encouraging such high levels of household debt.

According to Paile (2014), credit provision for the private sector in South Africa was R378 530 million in 2013. Debt level has been a controversial topic over the years, as many individuals have failed to comprehend the fact that high levels of debt can greatly impact their credit ratings. This results in the hindrance of being able to make large purchases or qualify to make loans. The paper seeks to investigate whether household indebtedness in South Africa has increased or decreased, identify the factors which contribute to the fluctuations and recommend remedies to surpass this widespread dilemma in the country.

## 2. LITERATURE REVIEW

According to the South African Reserve Bank (2021), South Africa's national saving rate declined from 16.4% in the third quarter of 2020 to 14.4% in the fourth quarter. The lower saving rate of households, and in particular of corporate business enterprises, outweighed the smaller dissaving by the general government. Despite large quarter-to-quarter fluctuations, the annual national saving rate remained at 14.6% in both 2019 and 2020. There has been a challenge in the country with most middle-income earners having to service their loans and not be able to save. Global trends which externally affect the growth of the South African economy have also contributed to the high debt levels households have had to endure. A large portion of the population want to save and avoid debt but due to the economic pressure and unexpected setbacks, it becomes very difficult to do so. Mutezo (2014) stipulates that in many countries, consumption accounts for more than half of gross domestic product (GDP). Consumption directly affects households' living standards and thus is an important measure of wealth, (Gerlach-Kristen, 2013). A nationwide lockdown restricted activity in Africa's most industrialized economy from March 27 and led to an annualized quarter-on-quarter contraction of 51% in gross domestic product in the three months through June, (Naidoo, 2020).

Dolan and Motsoeneng (2014) suggested that a number of macroeconomic variables such as the low interest rate environment, growth in unsecured lending and subsequent increases in household indebtedness, a large financial sector, excessive public spending and a large current account deficit, if not managed correctly, could lead South Africa into a debt crisis. Amid the growing concerns regarding the unsecured lending market it became apparent that economic conditions in South Africa were worsening, which has a direct effect on the ability of consumers to repay their loans.

According to Lombardi et al., (2017), the impact of household indebtedness on growth varies across countries depending on key characteristics such as the degree of legal protection of creditors. One possible interpretation of this result is that in the long run, household borrowers' actual debt service burden is higher for countries with stronger creditor protection than those with weaker creditor protection to the extent that lower loan spreads due to stronger creditor protection do not fully offset higher debt service burden, and thus household consumption and GDP growth is more likely to be lower for these countries.

Evidence from Zabai (2017) shows that a household's stock of debt affects its ability to deal with an unanticipated deterioration in its circumstances, such as lower income, lower asset prices or higher interest rates. In order to avoid cutting consumption too much, the household has a number of options including drawing down savings. Assets such as current account balances, stocks or mutual funds can easily be converted into cash.

### 2.1. Keynesian View

The Keynesian theory suggests that current household consumption behaviour is subject to current disposable income. However, critics contend that the theory focuses on current income instead of future possible income. Consumption is grounded on the "fundamental psychological law", which propose that a rise in income results in an increase in consumption but not as much as the increment in income. In other words, wealthy people are likely to consume more than the deprived individuals. Keynes conjectured that the MPC fall is between 0 and 1. He further proposed that the APC (the ratio of consumption to income) drops as income rises. Another vital statement is that consumption is highly dependent on household debt. For the public's affordability to purchase their necessities (without access to cash), they make use of credit that they have been granted with. Therefore, an increase in income (as it increases ones credit score) and consumption will lead to rise in household debt.

Consumption function of the Keynesian theory:

$$C = a + dY$$

Where,

C = represents household spending

$\alpha$  = denotes independent consumption

dY = is the disposable income

At the beginning of the 1950's, Franco Modigliani and his student Richard Burmberg formulated a philosophy which put emphasis on expenditure based on the knowledge that individuals make intellectual selections, when it comes to the amount of money they spend subject to the resources they have over the course of their lives.

## 2.2. Life-cycle Hypothesis

The LCH suggests that the working class save their income while they are still employed to ensure a financially secure retirement. "By building up and running down assets" Deaton (2005). The theory states a vital forecast about the economy as a whole, that domestic savings depends on the domestic income rate, not its level, and that the level of wealth in the economy bears a simple relation to the length of the retirement span. Modigliani and Burmberg found that a person's income is prone to fluctuations especially throughout their entire life's however savings allows that person to move their income from when income is high to when income is low. According to the life-cycle theory, households apply to credit markets because they want to have steady living conditions over the years. Since income generally increases at the beginning of a person's life and decreases in the period following retirement, debt is the means that allows households to smooth their expenses over their lives; young families expect their future income to grow and spend more than they earn, thus accumulating debts that they will repay when they are more mature.

The basic models of the consumption function of the LCH:

$W$  = Wealth,  $Y$  = Income,  $R$  = number of years until retirement and  $T$  = lifetime in years

$$C = \left(\frac{1}{T}\right)W + \left(\frac{R}{T}\right)Y$$

OR

$$C = aW + bY$$

$a$  = is the marginal propensity to consume out of wealth

$b$  = is the marginal propensity to consume out of income

## 2.3. Household Indebtedness Causes

The absence of financial competence is one of the elements leading to over-indebtedness; it has been proven that the less literate individuals have the tendency to take credit at inflated interest rate. Household over-indebtedness can come from demand and supply-side factors. Demand-side factors analyses consumer purchasing patterns and credit decisions, Amann and Baer (2012). The supply-side factors on the other hand puts emphasis on the operations of financial institutions, organisational micro-leaders and their credit market practices of providing credit to customers. Institutional changes such as decreasing government intervention in the financial industry and freer markets result in a decline in the real interest rate. Other factors include the absence of patience and a reduction in risk disinclination. Ultimately Fatoki (2015) concludes that the main causes of over debt can be grouped into

three categories: financial irresponsibility, household income shocks and microeconomic shocks.

## 2.4. Household Debt Measurement

The debt to income ratio assists financial institutions to verify not only the credit score of a debtor but also to evaluate whether they can afford to take an additional payment from their current income. The debt to income is a percentage of an individual's gross income (prior to tax) that is spent on their credit payments. It compares how much a person owes to how much they earn. When it comes to the payments of mortgages, automobiles or even credit cards, many moneylenders use the ratio to determine the loan amount that can be granted to the clients. The debt service ratio is one of the metrics used to gauge the load of debt servicing for households, Irby (2017). The ratio is often used as an indicator of household's economic health and is commonly described as the share of disposable income (net of taxes and transfers) that households should dedicate to servicing their debt duties. The ratio can be calculated two exclusive methods, Nkala and Tsegaye (2017). The conventional debt service ratio calculation best considers interest payments on debt as the cost of debt for families. An alternative method includes both interest payments in addition to fundamental repayments in debt servicing fees. A household's debt service ratio is a crucial indicator when it comes to a lender's selection to provide credit to that household.

The debt to assets ratio shows the extent to which a household uses debt as a form of financing. It indicates the percentage of total assets that are financed by creditors, liabilities, and debt. The higher the ratio of debt to assets, the greater the financial risk. The debt to total assets ratio is an indicator of financial leverage.

## 2.5. Types of Household Debt

Secured debt is a loan secured on an asset which serves as collateral. This means that if the person borrowing the money can't repay it, the creditor will then be able to take possession of the asset. The most obvious example of secured lending are mortgages, Paile (2014). Unsecured debt is lending provided to individuals that is not secured on an asset. Credit card lending is the most prominent example. Table 1 below shows some examples of secured and unsecured loans.

South Africa has the highest percentage of grants in the world. As a result, the disposable incomes of welfare recipients embody 23.5% of active consumers of credit, which also means that they simply become more creditworthy to incur more debt. Consumers earning less than R3 500 (minimum wage) account for 41.6% of the population and they too fall victim of being provisioned with credit they cannot honour, Harri (2017).

The level of indebtedness of the household sector in South Africa has recently mounted new heights. Figure 1 above indicates the credit attend to the domestic private specifically loans and advances to households. It depicts an increase from R 10, 033, 98 million in 2008 to R 14, 750, 94 million in 2015. The banking sector is by far the most important source of credit to households, Grobler (2016).

### 3. METHODOLOGY

This section portrays the methodology which was utilized in the formulation of the regression model. It starts with the econometric model, classification and validation of factors that influence household debt which is preceded by the clarification of the various methods that were utilized for analysis. Time series was used to evaluate the relationship among the variables.

#### Hypothesis

$H_0$ : The household debt level has not changed in South Africa over the period 2005-2019

$H_A$ : The household debt level has changed in South Africa over the period 2005-2019

$$HDEBT = f(CONS, INC, CPI, TAX, INF) \quad (1)$$

In this case, the studies regression equation now becomes:

$$HDEBT_t = \beta_0 + \beta_1 CONS + \beta_2 INC + \beta_3 CPI + \beta_4 TAX + \beta_5 INF + \varepsilon \quad (2)$$

The household debt function is expressed in natural logarithmic form as:

$$LHDEBT_t = \beta_0 + \beta_1 LCONS + \beta_2 LINC + \beta_3 LCPI + \beta_4 LTAX + \beta_5 LINF + \varepsilon \quad (3)$$

This progression is vital on the grounds that numerous economic time series show solid patterns that tend to increment with time. Data changed to logarithmic values will realize a steady pattern and keep away from heteroskedasticity all through the time of study. E-views 12 was used to analyse the data.

#### 3.1. Dependent Variable

LHDEBT = household debt

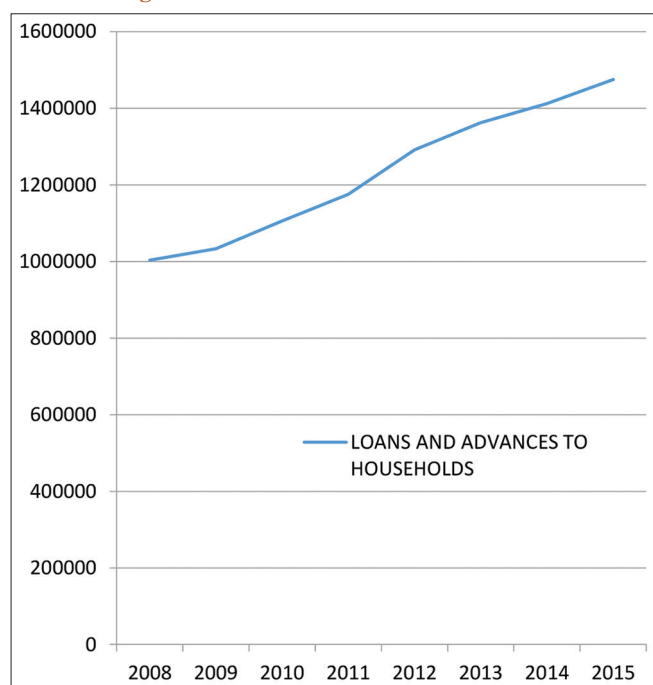
#### 3.2. Explanatory Variables

LCONS = consumption, LINC = income, LCPI = consumer price index, LTAX = taxation, LINF = inflation,  $\beta_0$  = intercept,  $\varepsilon$  = error term,  $\beta$  = parameter estimates

#### 3.3. Model Estimation

The paper used VECM to inspect the connection among the variables. VECM is a suitable displaying technique when the factors are cointegrated. Numerous economic variables show persistent upward or descending movement. This element can be created by stochastic patterns in incorporated variables. On the off chance that the same stochastic pattern is driving an arrangement of coordinated variables simultaneously, they are called cointegrated. For this situation certain linear combinations of integrated factors are stationary, Gujarati and Porter (2010). Such linear combinations that connect the factors to a typical pattern are called cointegrating relationships. They sometimes might be translated as equilibrium relationships in economic models, (Gujarati and Porter, 2010)

Figure 1: Loans and advances to households



Source: International Monetary Fund (2012)

Table 1: Examples of secured and unsecured loans

Term	Revolving
Secured loans	
Mortgage	Secured overdraft
Bridging loan	Secured credit card
Construction loan	
Term loan	
Car loan	
Unsecured loans	
Education loan	Overdraft
Renovation loan	Credit Card
Personal loan	Change card
	Personal line of credit

Source: Mutezo (2014)

Table 2: Results of ADF and PP @Level

Variable	Model specification	ADF test	PP test	Conclusion
LHDEBT	LEVEL			
	Intercept	0.381	0.289	Non-stationary
	Trend and intercept	0.620	0.494	Non-stationary
LCONS	None	0.599	0.594	Non-stationary
	Intercept	0.874	0.876	Non-stationary
	Trend and intercept	0.778	0.626	Non-stationary
LINC	None	1.00	1.00	Non-stationary
	Intercept	0.391	0.367	Non-stationary
	Trend and intercept	0.703	0.679	Non-stationary
LCPI	None	0.215	0.215	Non-stationary
	Intercept	0.207	0.434	Non-stationary
	Trend and intercept	0.472	0.093	Non-stationary
LTAX	None	0.604	0.464	Non-stationary
	Intercept	0.122	0.122	Non-stationary
	Trend and intercept	0.202	0.202	Non-stationary
LINF	None	0.782	0.782	Non-stationary
	Intercept	0.264	0.326	Non-stationary
	Trend and intercept	0.522	0.706	Non-stationary
	None	0.723	0.731	Non-stationary

**Table 3: Results of ADF and PP @1<sup>st</sup> difference**

Variable	Model Specification	ADF test	PP test	Conclusion
LHDEBT	1 <sup>st</sup> LEVEL			
	Intercept	0.000	0.000	Stationary
	Trend and intercept	0.000	0.000	Stationary
LCONS	None	0.000	0.000	Stationary
	Intercept	0.000	0.000	Stationary
	Trend and intercept	0.003	0.003	Stationary
LINC	None	0.050	0.012	Stationary
	Intercept	0.000	0.000	Stationary
	Trend and intercept	0.000	0.000	Stationary
LCPI	None	0.000	0.000	Stationary
	Intercept	0.000	0.000	Stationary
	Trend and intercept	0.000	0.000	Stationary
LTAX	None	0.000	0.000	Stationary
	Intercept	0.000	0.000	Stationary
	Trend and intercept	0.000	0.000	Stationary
LINF	None	0.000	0.000	Stationary
	Intercept	0.002	0.002	Stationary
	Trend and intercept	0.009	0.009	Stationary
	None	0.000	0.001	Stationary

**Table 4: Cointegration analysis with trace values**

Hypothesized no. of CE (s)	Eigenvalue	Trace statistic	0.05 critical value	Probability**
None*	0.966	341.079	95.754	0.000
At most 1*	0.893	209.209	69.819	0.000
At most 2*	0.783	122.133	47.856	0.000
At most 3*	0.618	65.515	29.797	0.000
At most 4*	0.463	25.025	15.495	0.000
At most 5	0.019	0.754	3.841	0.385

Trace test indicates 5 cointegrating eqn (s) at the 0.05 level. \*Denotes rejection of the hypothesis at the 0.05 level. \*\*MacKinnon-Haug-Michelis (1999) P-values

## 4. RESULTS AND DISCUSSION

A 5% probability value was chosen for significance level and the examination depends on the methods explained in the previous section. The outcomes are introduced in diagrams and tables with values rounded off to three decimal places.

Table 2 results show that all the variables are non-stationary at level form, which leads to them being subjected to stationarity testing at differenced form. Table 3 shows that at 1<sup>st</sup> difference, the variables become stationary.

The trace and eigenvalue statistics in Tables 4 and 5 demonstrate that there are five cointegrating conditions. This in turn implies that there are long run relationships among the variables, Dwyer (2015).

The long-run relationship for household debt in Table 6 indicates there is negative insignificant relationship between consumption and household debt. This means that a one-unit change in consumption causes a 7.892 decrease in household debt. These results are not in line with the economic theory. Table 6 further shows a positive significant relationship between household debt and income. A one unit increase in income results in an 8.363 increase in the level of household indebtedness amongst South Africans. The short run results in

**Table 5: Cointegration analysis with Maximum Eigen values**

Hypothesized no. of CE (s)	Eigenvalue	Max-Eigen statistic	0.05 critical value	Probability**
None*	0.966	131.869	40.078	0.000
At most 1*	0.893	87.077	33.877	0.000
At most 2*	0.783	59.618	27.584	0.000
At most 3*	0.618	37.489	21.132	0.000
At most 4*	0.463	24.271	14.265	0.000
At most 5	0.019	0.754	3.841	0.385

Trace test indicates 5 cointegrating eqn (s) at the 0.05 level. \*Denotes rejection of the hypothesis at the 0.05 level. \*\*MacKinnon-Haug-Michelis (1999) P-values

**Table 6: Results of the VECM for household debt in the long run**

Variable	Cointegrating equation	T-stat	Standard error	Constant
DLHDEBT (-1)	1.000			0.199
DLCONS (-1)	-7.892	-1.754	4.500	
DLINC (-1)	8.363	2.024	4.131	
DLCPI (-1)	-1.050	-4.335	0.242	
DLTAX (-1)	-0.284	-1.301	0.218	
DLINF (-1)	2.048	2.548	0.804	

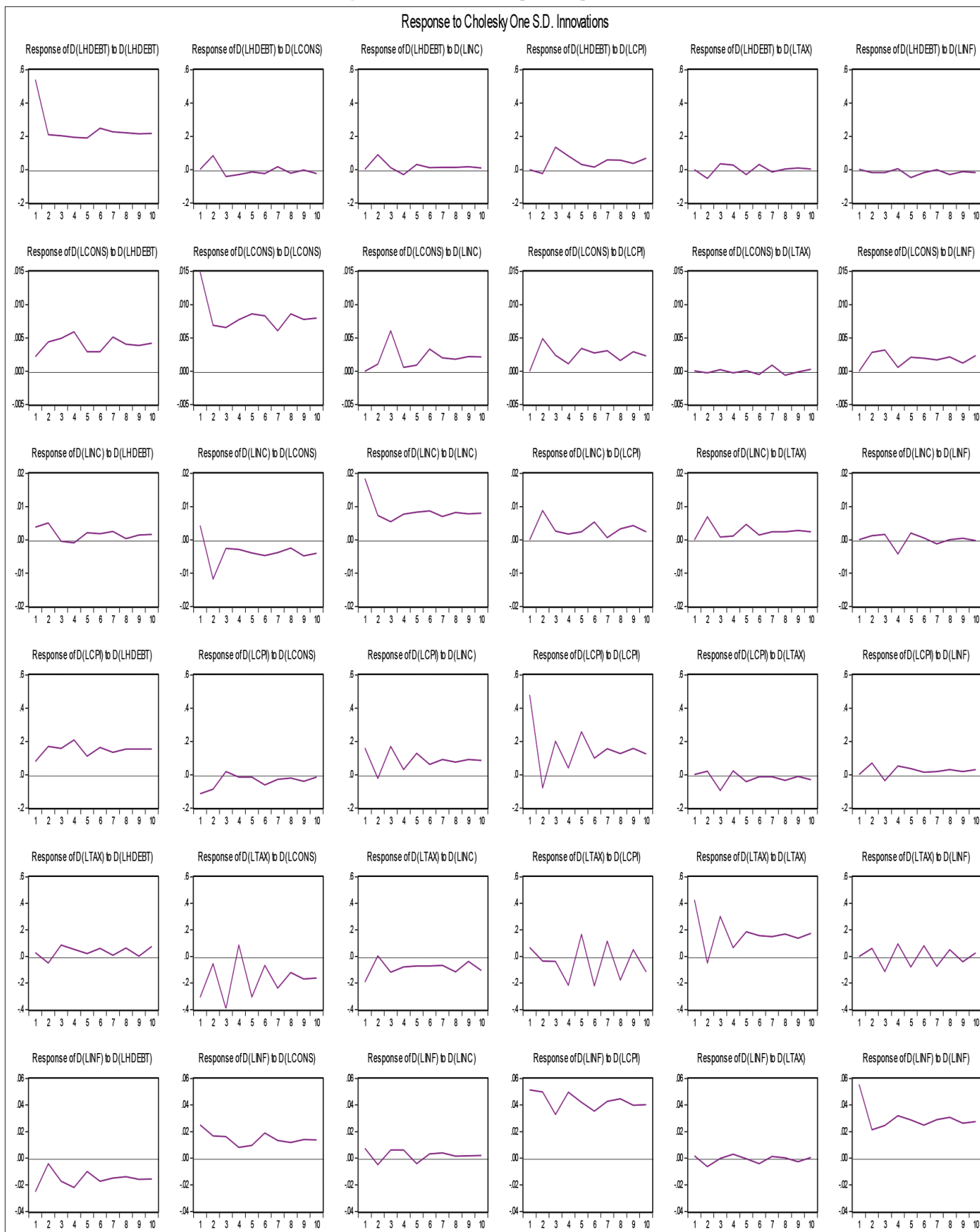
**Table 7: Results of the VECM for household debt in the short run**

Error correction	Cointeq1	T-stat	Standard error
ΔDLHDEBT	-0.421	-2.255	0.336
ΔDLCONS	0.011	1.154	0.009
ΔDLINC	-0.014	-1.184	0.012
ΔDLCPPI	0.853	2.617	0.326
ΔDLTAX	0.593	1.691	0.351
ΔDLINF	-0.075	-1.448	0.052

Table 7 reveal the error term is negative (-0.421) and significant (-2.255).

From Table 8, in the first period, 100% variation due to shock in DLHDEBT is attributed to DLHDEBT itself. In the third period,

Figure 2: Results of the impulse response functions



90.349% of variation due to a shock in DLHDEBT is attributed to DLHDEBT itself, 2.148% DLCONS, 1.900% DLINC, 4.489%

DLCPI, 0.964% DLTAX and finally 0.151% DLINF. In the fifth period, 89.140% of variation due to a shock in DLHDEBT

**Table 8: Results of variance decomposition**

Variance period	Decomposition S.E	D (LHDEBT)	D (LCONS)	D (LINC)	D (LCPI)	D (LTAX)	D (LINF)
1	0.541	100.000	0.000	0.000	0.000	0.000	0.000
2	0.595	94.736	2.003	2.200	0.174	0.797	0.089
3	0.646	90.349	2.148	1.900	4.489	0.964	0.151
4	0.681	89.301	2.136	1.909	5.496	1.017	0.140
5	0.710	89.140	2.009	1.932	5.229	1.123	0.568
6	0.754	89.960	1.894	1.734	4.683	1.168	0.561
7	0.790	90.226	1.766	1.607	4.793	1.096	0.511
8	0.823	90.310	1.702	1.505	4.870	1.011	0.602
9	0.852	90.670	1.589	1.445	4.731	0.952	0.583
10	0.882	90.606	1.558	1.358	4.999	0.889	0.591

is attributed to DLHDEBT itself, 2.009% DLCONS, 1.932% DLINC, 5.229% DLTAX, and the rest 0.568% DLINF. The variance decomposition indicates that in the short run, household debt in South Africa is mostly explained by itself while in the medium-term, it is still household debt with slight influences from consumption, income, consumer price index, taxation and inflation.

In Figure 2, the responses of the variable shocks in the VECM model for 10 quarters ahead are shown. The movement above the zero line reflects a positive effect between the responses of DLHDEBT to DLHDEBT. However, the graph shows a sharp decline during the second period of DLHDEBT to DLCONS.

## 5. CONCLUSION

Based on the findings, the study rejects the null hypothesis and conclude that the level of household debt in South Africa has indeed changed over the period 2005Q1-2019Q4. The objective of this study was satisfied with the guide of a broad econometric examination.

The graphical assessment of household debt proposes that the 2007-2009 financial crises influenced the household debt level in South Africa to a lesser degree. Prior to the time of the crisis, debt was high and kept on expanding swiftly. During the time of the financial disaster, the study reveals that the level of household debt continued expanding and encountered a slight decline yet at the same time stayed high. The Johansen cointegration investigation affirms the designated move collected in long run. To have a significant association, the cointegrating vector was standardized on household debt. It is presumed that the long run increment in household debt can be ascribed fundamentally to DLINC and DLINF. Additionally, the paper arrived at the conclusion that not every one of the variables have the expected signs as the hypothesis proposed. In the short run DLCONS and DLINF bear the right signs for the error term yet seem to be statistically insignificant the factors LDINC, LDCPI, LDTAX do not have the correct signs as expected. The coefficient had the normal sign (negative) and is significant. It can be declared that in the short run, around 42.1% of the disequilibrium is remedied each quarter for the entire framework to be re-set up back to equilibrium.

The results of the VECM model indicate a negative relationship between consumption and household debt in the long run, which

is not in alliance with theory. Economic theory suggests that there is a positive relationship between the two variables (an increase in consumption will results in an increase in household debt). The solution is to ensure that South Africans purchase commodities and services that are essential such as food and education instead of wasting money on unnecessary luxury items. Another recommendation is to formulate household budgets and strive to adhere to it.

The study shows a positive relationship between income and household debt. The more an individual earns, the higher their credit provision. Lack of savings is a huge problem in South Africa. Instead of exhausting their credit and increasing their instalments, individuals can opt to save their income to achieve financial independence.

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