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BUSINESS SENTIMENTS AND ECONOMIC GROWTH IN SOUTH AFRICA

Abstract:

Economic confidence is considered an important instrument in forecasting macroeconomic fluctuations. In every country, government is a central institution that is expected to stabilise the economy through proper economic policies implementation. However, it is in understanding the relationship between business sentiments and economic growth that major impact on their proxies, Business Confidence Index and Gross Domestic Product can be analysed and influenced. Therefore, the main objective of this article was to evaluate the relationship between business sentiments and economic growth in South Africa. The study employed a quarterly time series data for the period of 10 years ranging from 2008 to 2017, extracted from the Bureau of Economic Research and the South African Reserve Bank. The study employed an econometric methodology using the Johansen multivariate to test for cointegration and the Vector Error Correction Model to test relationships. The empirical results found suggest that there is a positive and significant long run relationship between Gross Domestic Product and Business Confidence Index. Thus, policy makers should consider the determinants of business sentiments and economic growth in South Africa in an attempt to enhance confidence and economic activities by creating an enabling environment for business operations to attract capital investment into the country.

Keywords:

Business Sentiments, Business Confidence Index, Economic Growth, Gross Domestic Product, Johansen Cointegration, South Africa

Introduction

Although conditions in economic sectors such as mining, agriculture, retail trade and manufacturing in South Africa (SA) have recently showed varying degrees of improvements, the economic environment generally remains weak. The country's confidence level amongst consumers and business enterprise are still very low, adversely implicating production output, household spending and fixed investment. SA's GDP growth is projected at 0.6% in 2017, a further expansion of 1.2% is forecast for 2018 and an accelerated 2.6% by 2020; provided that there are no additional adverse developments but rather where positive economic activity is expected, as indicate by Industrial Development Corporation (2017). National Treasury (2018) reiterates and further outlines that in order to enhance employment and capital expenditure, an increase and sustainable level of confidence is required. In so doing, Government will reduce policy uncertainty through the implementation of structural reforms that promotes investment, and furthermore decisively act towards strengthening governance and sound financial management within state-owned enterprises.

It is often suggested that confidence has an influence on business cycle, and that raises queries on how expectations can translate into actions affecting the economic activity. According to Pellissier (2002) there are basically two ways in which confidence can have an effect on business cycle fluctuations: one is when actions by people are influenced by their thoughts on other peoples' intentions, and the other is to assess surveys conducted on professional forecasters. Such data can therefore be used in relation to their dates of releases to assist in assessing how change in perceptions and expectations affect economic performance of a country.

This paper therefore attempts to address the above mentioned matter. In particular, a systematic and consistent methodology is adopted to test whether there is evidence of significant impact and the linkage level between business confidence and Gross Domestic Growth (GDP) in SA.

1. Business sentiments and Economic growth

In an economic theoretical sense, the term "business confidence" is described as the level of sentiments towards business risk taking for whatever reason involved. The economic environmental reaction by business people can thus be interpreted as a function of their perception on current business conditions and expectations on future prospects. Therefore, the level of these two psychological characteristics have a direct impact on the human nature behaviour and action taken by business people, thus extensively ascribed to confidence level which has a positive effect on fixed capital investment and ultimately impart on economic growth (Pellissier, 2002).

Two sources of business confidence indicators are frequently published in SA: the Bureau of Economic Research Business Confidence Index (BER BCI) and the South

African Chamber of Commerce and Industry Business Confidence Index (SACCI BCI). The BER BCI, has particularly proved valuable performance in predicting economic growth and as a turning point leading indicator in SA's business cycle, similar to that of official coincidence indicators of the South African Reserve Bank (SARB). The BCIs also include significant information for the output growth prediction, consequently being constructive tools to appropriately monitor economic developments forecast future economic activity. (Boshoff & Binge, n.d).

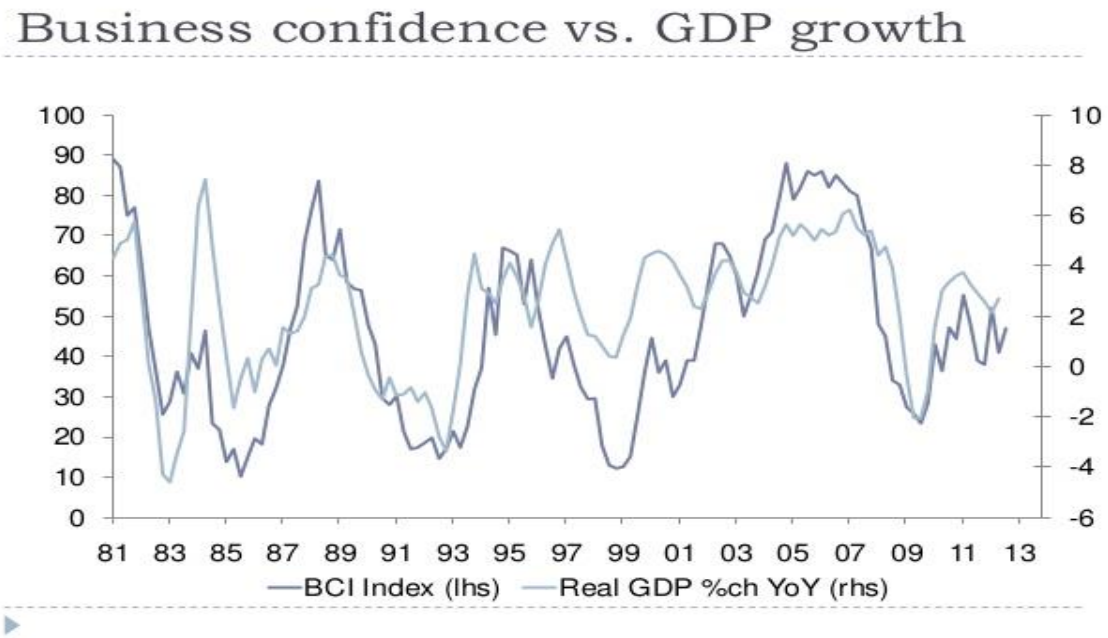


Figure 1.: BCI vs real GDP growth *(Source: BER survey UCT, 2012)*

Although, the study evaluates the RMBJ/BER BCI numbers published quarterly, Figure 1 takes a look at the annual average business confidence level and evaluates its yearly based movements in order to determine the annual fluctuations of business confidence against the South African currency (rand) value. The line chart above tracks the average annual business confidence from 1981 until 2013. A value of zero indicates that investors have no confidence in the business environment, while 50 indicates neutral confidence, and 100 indicates extreme confidence by businesses in the economic environment. Based on the above line graph, it is evident that businesses in SA have not been very confident or optimistic about the country's economy in a while. Further signal is depicted by the high unemployment statistical data, or the industrial/sectoral gradually declining performance, such as manufacturing. SA's business confidence has been below neutral (less than 50) for approximately the past 11 years. It therefore shows highlights of slow to no economic growth and high unemployment levels, leading to deteriorating tax revenue collections. The newly appointed president of the country and the cabinet are faced with a mammoth task which may continue for years until SA graduates and achieve the

required economic growth adequate to reduce unemployment and poverty level (Maynard, 2018).

2. Econometric Methodology

3.1 Source of data

This research project is basically concerned with the functions to place emphasis on business sentiments and the economic growth in SA. Thus, it will cover real GDP performance in the country where business sentiments are relevant indicators for the economic growth process of the country. The time series analysis is adopted and the quarterly review is over a span period of 10 years, between the years 2008 and 2017. The study will form a compilation and analysis of data collected from secondary sources, and will be based on quantitative research data and statistical analysis. As already mentioned earlier, a composition of the most standard and credible data sources will be adopted, derived from the BER and the SARB.

3.2 Model estimation

As already mentioned earlier in the paper, the investigation of the correlation between real GDP as a proxy for economic growth, business sentiments variables and other relevant indices in SA is analysed based on the specified model further along the paper. In a more precise manner, real GDP is regressed on macroeconomic variables: BCI, EMP, INV and CCI which are considered as important factors that could affect the economic growth and the development of the economy at large.

Thus, the analysis depends on investigating the relationship among the independent variables versus the dependent variable, by using South African quarterly time series data for the period 2008–2017. Following Gujarati & Porter (2010), the study firstly employs the Johansen multivariate procedure and the process begins by testing the incorporated variables for stationary because non-stationary variables can lead to spurious results. In achieving this, the study conducts a unit root test by employing the Augmented Dickey–Fuller test and the Phillip-Perron test. Once variables are proved to be stationary, the study proceeds by testing variables for cointegration. And that is conducted by using the Johansen multivariate method based on unrestricted Vector Autoregression (VAR). Furthermore, the Vector Error Correction Model (VECM) is essentially employed to determine the long and short run relationship amongst the included variables.

3. Research Analysis

4.1 Results of Unit root test

Unit root test is preliminarily done to test for stationarity among the time series variables. Further tests cannot be conducted if variable are found to be non-stationery, therefore different level forms of order of integration and difference levels will be explored to find stationarity of all variables. The ADF and PP tests are adopted for this purpose.

Table 1 Augmented Dickey Fuller and Phillips-Perron tests

			ADF TEST		PP TEST	
Variables	Order of integration	Model specification	Lags	ADF critical and probability values	Band width	PP critical and probability values
LGDP	2nd difference	Intercept		(-5.237361) 0.0002***		(-67.86640) 0.0029***
		Trend and Intercept		(-5.157460) 0.0011***		(-66.76696) 0.0000***
		None		(-5.340055) 0.0000***		(-67.24938) 0.0000***
LBCI	2nd difference	Intercept		(-6.175495) 0.0000***		(-41.05667) 0.0001***
		Trend and Intercept		(-5.809955) 0.0002***		(-44.27283) 0.0000***
		None		(-6.363375) 0.0000***		(-34.58325) 0.0000***
LEMP	2nd difference	Intercept		(-1.655674) 0.4423		(-5.743510) 0.0000***
		Trend and Intercept		(-1.722547) 0.0021***		(-5.940608) 0.0001***
		None		(-8.844996) 0.0627		(-5.852218) 0.0000***
LINV	2nd difference	Intercept		(-5.348109) 0.0001***		(-9.187346) 0.0000***
		Trend and Intercept		(-5.330007) 0.0006***		(-8.999649) 0.0000***
		None		(-5.431037) 0.0000***		(-9.556736) 0.0000***
LCCI	2nd difference	Intercept		(-7.799684) 0.0000***		(-43.65550) 0.0001***
		Trend and Intercept		(-7.869024) 0.0000***		(-42.50828) 0.0000***
		None		(-8.116196) 0.00000***		(-46.22499) 0.0000***

***stationary at 1%, **stationary at 5%, *stationary at 10% level of significance

Table 4.1 indicates the ADF test results in levels and difference forms for all variables in the model. Only LEMP amongst all variables has no unit root in level, therefore differencing of other variables in required to achieve stationarity. When first difference order is employed, all variables except for LEMP indicate no unit root. The second difference order is then employed, as a result, all variables indicate no unit root. Since

the series display stationarity, it means the null hypothesis cannot be rejected as the variables are integrated of the same order *I* (2). As the individual time series indicate evidence of no unit root (stationary) and are integrated of the same order, it means the study can proceed to perform the cointegration test.

4.2 Results of Cointegration test

The aim of the cointegration test is to assist in establishing the long run equilibrium features between the variables in the model. Therefore, the cointegration equation is generated defines a stationary linear combination amongst the variables. Two components are used to estimate the characteristic and dynamic cointegration of variables, i.e. the long run equilibrium and short run disequilibrium, respectively. In this case, the Johansen's maximum likelihood method is used for this purpose. But, before the estimation of cointegration test, an indication of the lag order should be determined as a requirement by the Johansen procedure.

Table 2 Lag length criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	132.1140	NA	8.55e-10	-6.690210	-6.474738	-6.613547
1	332.4565	337.4190*	8.51e-14*	-15.91876*	-14.62593*	-15.45879*
2	354.7941	31.74281	1.05e-13	-15.40844	-13.40844	-14.93534

*lag order selected by the criterion

Table 4.2 presents the lag length selection criteria indicate a maximum of 2 lags and five information criteria used are: LR- sequential modified Likelihood Ratio, FPE- Final Prediction Error, AIC- Akaike Information Criterion, SC- Schwarz Information criterion, and HQ- Hannan-Quinn Information Criterion. Based on the results, it is clear that the majority of the selection criteria specify a lag length of 1. For the purpose of this study, the interest lies with the AIC and SIC criterion, which means the choice amongst criteria depends on the lowest lag between AIC and SIC. Since lag 1 provides the lowest values of both AIC and SIC, it is thus adopted and will be used to determine the Johansen cointegration results to follow.

The Johansen cointegration procedure takes form of two different likelihood-ratio tests: trace and maximum eigenvalue. The null hypothesis for the trace test states that the cointegrating vectors are less than (≤ r) the number of variables in the equation and the alternative hypothesis states that the cointegration vectors are equal to (=r) the number of variables in the equation. And the null hypothesis for the maximum eigenvalue states that the cointegrating vectors are equal (=r) and the alternative hypothesis states that the cointegrating vector plus one (r +1). Thus, the following results shown in Table 4.3 and 4.4 present the results of the trace test and maximum eigenvalue test.

Table 3 Unrestricted cointegration rank test (Trace)

Hypothesised no. of CE(s)	Eigenvalue	Trace statistics	0.05 critical value	Prob. **	Conclusion
None*	0.593086	70.39010	69.81889	0.0450	Reject H_o
At most 1	0.345024	36.22223	47.85613	0.3852	Fail to reject H_o
At most 2	0.269421	20.14229	29.79707	0.4133	Fail to reject H_o
At most 3	0.181472	8.213384	15.49471	0.4429	Fail to reject H_o
At most 4	0.015769	0.603983	3.841466	0.4371	Fail to reject H_o

The trace test presented in Table 4.3 indicates that there is 1 cointegrating equation at 5 per cent level of significance. The trace statistics at none reveal a trace statistic of 70.39 which greater than its critical value of 69.82 per cent. Therefore, since the trace test indicates evidence of 1 cointegrating vector, the study rejects the null hypothesis of no cointegration vector and conclude that there is conitegration.

Table 4 Unrestricted cointegration rank test (Maximum Eigenvalue)

Hypothesised no. of CE(s)	Eigenvalue	Max-Eigen statistics	0.05 critical value	Prob**	Conclusion
None*	0.593086	34.16787	33.87687	0.0462	Reject H_o
At most 1	.0345024	16.07994	27.58434	0.6590	Fail to reject H_o
At most 2	0.269421	11.92890	21.13162	0.5547	Fail to reject H_o
At most 3	0.181472	7.609400	14.26460	0.4198	Fail to reject H_o
At most 4	0.015769	0.603983	3.841466	0.4371	Fail to reject H_o

The maximum eigenvalue test presented in Table 4.4 indicates that there is also 1 cointegrating equation at 5 per cent level of significance. Also, the study rejects the null hypothesis of no cointegration vector. Since both the trace test and maximum eigenvalue test reveal evidence of at least one possible cointegration vector, the study will follow both cointegration likelihood-ratio tests. Thus, such evidence of the cointegrating vectors can be illustrated by a cointegration graph below.

4.3 Results of Vector error correction model

The presence of cointegration between variables suggests that a long run relationship exists between the dependent variable LGDP and the independent variables which also implies that the VEC model can then be applied. The VEC model has an advantage of estimating and distinguishing the long run relationship and the short run relationship between variables. The following two tables present the VECM results respectively.

Table 5 Long run relationship results

Variables	Coefficient	Standard error	t-statistics
Constant	-66.28525	-	-
LGDP(-1)	1.000000	-	-
LBCI(-1)	0.133071	0.1502	0.84748
LEMP(-1)	10.26704	1.14804	8.94303
LINV(-1)	0.408483	0.31045	1.31578
LCCI(-1)	0.040437	0.02446	1.065287

Table 4.5 shows the long run relationship between LGDP, LBCI, LEMP, LINV and LCCI. Therefore, the results suggest that there is a positive relationship between LGDP and all the independent variables in the long run. The absolute t-statistic value for the independent variable LEMP is the only one that exceeds the absolute value of 2 indicating that it is statistically significant while the other variables LBCI, LINV and LCCI are insignificant. The significance level of all the coefficients is at 1% level. Thus, a 1% increase in LGDP is likely to increase LBCI by 0.13%, LEMP by 10.3%, LINV by 0.41% and LCCI by 0.04%. These signs concur with the expected priori outlined in chapter 2, as also concluded by the study conducted by Mermod and Basdas (2010), that there is a long run relationship between business sentiments and economic growth.

Thus, this relationship between LGDP and all the independent variables from the period 1980 to 2017 can be summarised in the following equation:
LGDP = -66.3 + 0.13LBCI + 10.3LEMP + 0.41LINV + 0.04LCCI
Based on the above equation, a positive relationship between the dependent variable LGDP and all the independent variables are consistent with economic theory. The short run ECM results are shown below.

Table 6 Error Correction Model (ECM) results

Variables	Coefficient	Standard error	t-statistics
LGDP (-1))	-0.017158	0.01435	-1.19599
LBCI (-1))	-0.457666	0.22511	-2.03303
LEMP (-1))	-0.025909	0.00441	-5.87208
LINV (-1))	-0.011106	0.04249	-0.26139
CCI (-1))	-2.535383	1.61916	-1.56586
C	0.028388	0.00588	4.82458
R-square	0.572856	-	-
Adj R-square	0.384913	-	-

The error correction aims to correct any disequilibrium that may have transpired in the previous year. The results of the ECM on Table 4.6 indicate that the variable LGDP is negative and statistically insignificant as the absolute t-statistic is -1.196, which is not greater that the absolute value of 2 as required. Since the Error Correction Term (ECT) is meant to make corrections resulting from shocks in the system in the long run equilibrium, it is thus expected to be negative. The coefficient of LGDP is -0.0172, and implies that the speed of adjustment is 1.72 per cent. This means that only 1.72% is corrected in 1 year as the variable LGDP moves towards the equilibrium, should there be any deviation from equilibrium. The results of the ECT shows that there is an issue between the dependent and independent variables in the long run equilibrium, the concern is confirmed by the low speed of adjustment.

Meanwhile, the R-squared value of 0.57 suggests that only 57% of the variations in LGDP is explained by the independent variables. Likewise, the Adjusted R-squared value of 0.38 indicates that only 38% of the independent variables explain the variation of LGDP.

4.4 Results of Diagnostic test and Stability test

Diagnostics tests provide relevant information concerning the data behaviour and the adequacy of the model, hence they important to conduct when modelling time series data. During model estimation, the application of diagnostics tests can be used to assess the residuals of the model. Therefore, it is vital to conduct various diagnostics tests to determine the significance of the dependent variable in the model. Thus, this study adopts three diagnostic tests: autocorrelation LM test, normality test and heteroskedasticity test. Below are the results to that effect.

4.4.1 Autocorrelation LM test

Table 7 VEC serial correlation LM test

Null hypothesis	Lags	LM-stat	Probability	Conclusion
No serial correlation	1	25.48244	0.4356	No evidence of serial relationship

The null hypothesis of the LM test states that there is no serial correlation at lag order 1. The results as shown in Table 4.7 suggest that there is no serial relationship as the probability value is 0.44 which is greater the 5 percent level of significance. Therefore the study fails to reject the null hypothesis of the LM test which states that there is no serial correlation.

4.4.2 Normality test

Table 8 VEC residual normality test

Null hypothesis	Component	Type	Chi-square	Probability	Conclusion
Residuals are multivariate normal	Joint	Jarque-Bera	2.228862	0.328102	Residuals are normally distributed

The null hypothesis of the normality test states that the residuals are multivariate normal. The Jacque-Bera statistic of 2.23 and the probability of 0.33 indicated in Table 4.8 suggest that the residuals are normally distributed. Therefore, the study fails to reject the null hypothesis of the normality test which states that the residuals are multivariate normal.

4.4.3 Heteroskedasticity test

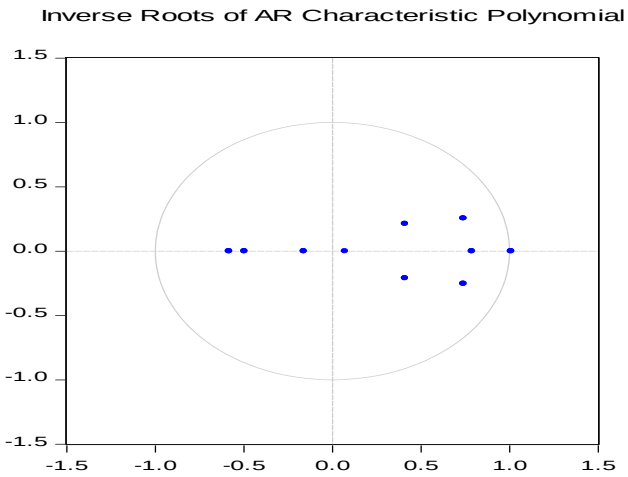
Table 4.9 VEC residual heteroskedasticity test

Null Hypothesis	Component	Chi-square	Probability	Conclusion
No heteroskedasticity	Joint	305.0240	0.8344	No evidence of heteroskedasticity

The null hypothesis of the heteroskedasticiy test states that there no heteroskedasticity. The results shown in Table 4.9 reveals the probability of 0.83 from the White heteroskedasticity test (no cross terms) which is greater than the 5 percent level of significance and suggest that there is no heteroskedasticity. Therefore, the study fails to reject the null hypothesis which concludes that there is no heteroskedasticity.

4.4.4 Stability test

Figure 2 Autoregressive root graph



The AR root graph as illustrated in Figure 4.2 is mainly used to detect and depict model stability for the specified country and period under evaluation. In this case, the study is undertaken for SA for the period of 2008-2017, based on the indication that all unit root points are covered inside the unit cycle in the graph, it states that the model is therefore stable. The study will then continue to conduct an impulse response analysis.

4.5 Results of Impulse response analysis

Impulse response analysis reveals the reaction of the dependent variable in the VAR to shocks to the error term. This implies that impulse response functions (IRFs) are useful in determining how government expenditure reacts to its own shock and those of its independent variables. Output of the impulse response is normalized to have an impact of one percent. This is achieved by dividing each shock by the standard deviation of the corresponding fiscal shock. Impulse response can reveal the persistence and direction over a certain period. The impulse response results are shown by Figure 4.3.

Figure 3 Impulse response graphs

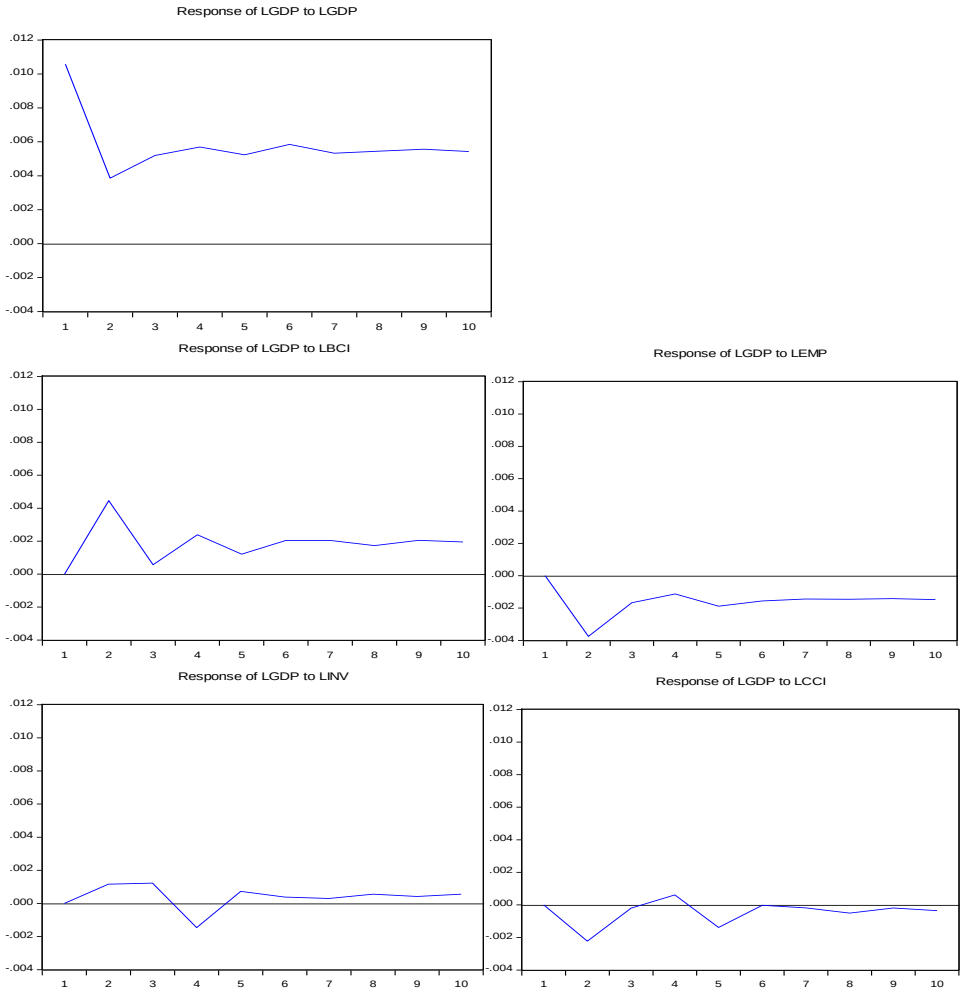


Figure 4.3 shows the impulse response of the variables in the model over a 10 year period. The response of LGDP to LGDP indicates an increasing positive effect to a

slight decreasing positive effects on itself, which suggest that a shock in LGDP will cause an increase in LGDP. The response from LGDP to LBCI starts with a slight decreasing positive effect to a positive increasing effect, which means a shock from LBCI causes LGDP to increase. The response from LGDP to LEMP starts with an increasing negative effect to decreasing negative effect, which means a shock in LEMP will cause LGDP to decrease. The response in LGDP to LINV starts with a decreasing positive effect to a slight negative increase and back to positive effect, which means a shock in LINV will cause LGDP to increase. The response in LGDP to LCCI starts with an increasing negative effect then fluctuates to negative effect, which means a shock in LCCI will cause a LGDP to decrease. The impulse responses of all independent variables are found to be non-persistent. Since the shock of LGDP to LGDP is positive it means the impulse response is significant.

4.6 Results of Variance decomposition

Since, the dynamic responses or shocks of the variables of interest to government revenue were analysed using impulse response functions. This section calculates the forecast error variance decomposition of the economic variables. This is done to assess how the previously determined shocks are transmitted through the system. Furthermore, variance decomposition measures the contribution of shock to the variance decomposition of that variable. This provides relative information about each shock and how it affects the endogenous variables in the VAR system. The variance decomposition results are shown by Table 4.10.

Table 10 Variance decomposition of (LGDP)

Period	S.E.	LGDP	LBCI	LEMP	LINV	LCCI
1	0.010579	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.012924	75.90667	11.88558	8.432584	0.806150	2.969011
3	0.014095	77.41242	10.15220	8.484956	1.433940	2.516489
4	0.015511	77.41218	10.74774	7.529838	2.076909	2.233335
5	0.016598	77.56588	9.914976	7.868746	2.004236	2.646159
6	0.017790	78.33254	9.951827	7.620518	1.791605	2.303514
7	0.018742	78.65905	10.15852	7.457022	1.640069	2.085346
8	0.019664	79.14451	10.00251	7.320630	1.571639	1.960718
9	0.020594	79.47261	10.11099	7.415236	1.474606	1.796555
10	0.021447	79.67759	10.15126	7.060409	1.426797	1.683941

The study used a 10 year period to analyse the variance decomposition of the variables in the model. Based on the variance decomposition of LGDP results presented in Table 4.10 the dependent variable LGDP and the independent variables are explained by their shocks in the first year. However, the fluctuations of the LGDP model are mainly explained by the shocks of LBCI in the long run. In the sixth year forecast, LBCI shock accounts for 9.95%, whereas LEMP, LINV and LCCI shocks accounted for 7.62%, 1.79% and 2.3% respectively.

Furthermore, even the last remaining years still to shows evidence that the shock of LBCI continues to have a greater explanatory influence in the significant proportion of variation in LGDP. Looking at the last year, the shock of LBCI increased to 10.15% while the shocks of LEMP, LINV and LCCI decreased to 7.06%, 1.42% and 1.68% respectively. In the short run, these results suggest shocks to the independent variables are significant in explaining the dependent variable. Thus, these results are also consistent with the impulse response analysis which indicate that the variable that the shock in LBCI has the greatest influence in LGDP over the period. Whilst, the shocks of other explanatory variables only explains a smaller percentage of variation to the dependent variable. Also, as shown in the impulse response analysis, LGDP explains a higher percentage of its own variation.

4. Conclusion

The main objective of this article was to evaluate the relationship between business sentiments and economic growth in South Africa. The study employed a quarterly time series data for the period of 10 years ranging from 2008 to 2017, extracted from the Bureau of Economic Research and the South African Reserve Bank. The study employed an econometric methodology using the Johansen multivariate to test for cointegration and the Vector Error Correction Model to test relationships. The empirical results found suggest that there is a positive and significant long run relationship between Gross Domestic Product and Business Confidence Index. Thus, policy makers should consider the determinants of business sentiments and economic growth in South Africa in an attempt to enhance confidence and economic activities by creating an enabling environment for business operations to attract capital investment into the country. In essence, radical socio-economic transformation vision by government should not only be about redressing the past but also ensuring more participation by people in the economy and move towards changing the economic structure of a dynamic private sector that mobilizes investment, creates employment, penetrates export markets, generates wealth and opportunity. Ultimately, the objective should be to encourage solidarity and collective action leading to an equitable and cohesive economy and society.

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