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The Impact of Exchange Rate Volatility on Credit Risk in South African Banking Portfolios

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Abstract: Macroeconomic shocks affect loan defaults in the credit markets. The South African rand has been volatile with low economic growth and high unemployment. The objective of this paper was to determine the impact of exchange rate volatility on credit risk in South African banking portfolios. Imperfect information, deflation and utility theories formed the theoretical foundation of the study. Additionally, empirical literature consulted demonstrated inconclusive findings on the nexus between macroeconomic factors and credit risk. Cointegration and error correction models were applied on time series data to determine the impact of selected macroeconomic variables on credit risk. The results show that macroeconomic shocks significantly affect bank asset quality. A 1% increase in exchange rate increases impaired loans by 0.57%. Based on these observations, it is evident that the exchange rate variability affects the loan portfolio default risk via its positive or negative influence on obligor cash flows. This article is valuable for **b**anking sector stability; hence, policymakers should understand macroeconomic fundamentals that significantly affect bank asset quality. Further research is recommended at sectoral level.

Keywords: Exchange rate; credit risk; cointegration; information asymmetry; South Africa

JEL Classification: A12; C22; F31; E51

1. Introduction

In South Africa, the financial sector has made a substantial contribution to the stability of the economy (National Treasury, 2018). The finance, real estate and business services sector contributed 20% to the country's gross domestic product (GDP) compared to 13% and 8% for the manufacturing, mining and quarrying sectors respectively (Statistics South Africa [Stats SA], 2018). Bernanke (2018) reiterates that

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a deep and liquid financial market promotes growth by allocating capital effectively. The premium at which banks charge their loans is influenced by macroeconomic development in the economic systems within which banks operate (Bernanke, 2018). However, the South African (SA) economy has been experiencing structural challenges such as low commodity prices, weak economic growth and currency volatility (Moneyweb, 2018; SARB, 2016). The SA rand (ZAR) has lost significant value against major international currencies and it is among the most volatile currencies in the emerging markets. Comparing the currencies of emerging market economies (EMEs), the ZAR has underperformed, and it is more susceptible to investor sentiments depreciating by almost 17% (Moneyweb, 2018). In the emerging markets currencies the rand is among the most volatile, exhibiting sensitivities to a number of economic and political factors and this has an effect on the performance of the financial sector (FXCM, 2020; SARB, 2016)

Macroeconomic uncertainty and the negative perceptions on governance around key economic institutions, continues to contribute to the tumbling of the rand against the major currencies and the threat of downgrading of South Africa (Redl, 2018). Government bailouts of the key institutions such as Eskom are viewed as reducing the financial manoeuvring of the economy given slow economic growth and increasing unemployment rate (Moody's, 2019). Božović, Urošević & Živković, (2009) argued that a significant depreciation of the domestic currency increases the likelihood of default resulting in feedback mechanisms with other macroeconomic variables. Bernanke (2018) argued that a modern economy realises its full potential amidst healthy financial conditions. A robust banking system enhances resource allocation through proper financial intermediation; consequently, evidence on the determinants of bad loans is a concern to policymakers and researchers alike (Kochubey & Kowalczyk, 2014). According to Chaibi and Ftiti (2015), the effects of the macroeconomic variables on credit risk vary between different banking systems, i.e. bank-based systems and market-based systems. In a sub-Saharan Africa study, Fofack (2005) found that macroeconomic volatility and economic downturns increase the scope of impaired advances and deterioration in bank loan portfolios. If risky bank portfolios coincide with a difficult macroeconomic environment, it results in bank failures (Koju, Koju and Wang 2019), therefore, the objective of this paper is to determine the relationship between exchange rate volatility and credit risks in South African banking portfolios. An increased credit risk in banks is an indicator of financial vulnerability of an economy (Koju et al., 2019, Bernanke, 2018).

2. Literature Review

This section explores the theoretical and empirical literature of the relationship between the exchange rate volatility and credit risk in South African banking portfolios.

2.1. Theoretical Review

There are theories which explain how credit risks arise in the credit markets and these theories are outlined in subsection 2.1.1 to subsection 2.1.3. Figure 1 below gives the conceptual framework of financial intermediation.

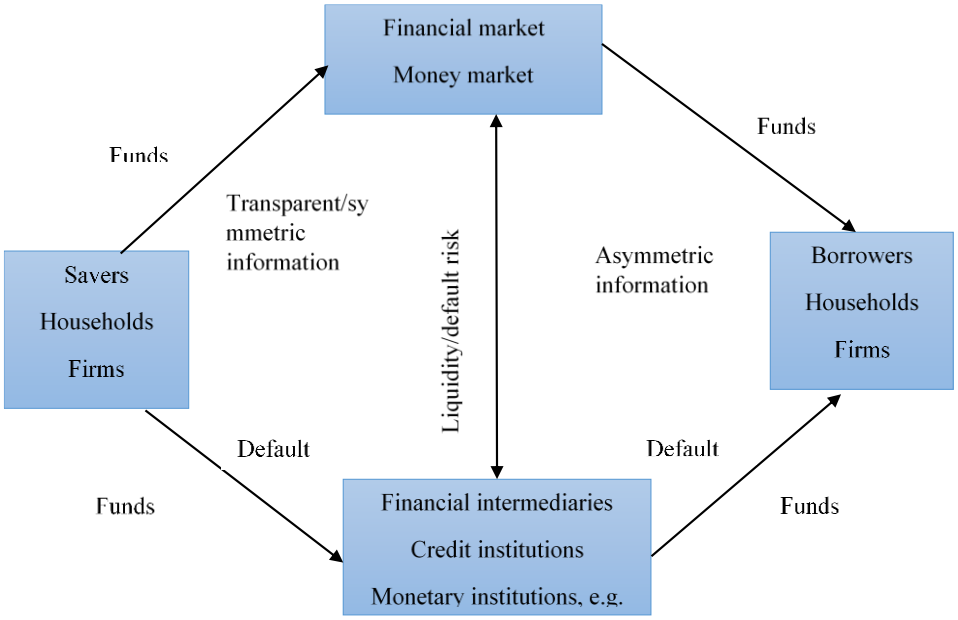

Figure 1. Financial Intermediation
Source: Adapted from European Central Bank (ECB, 2015)

The intermediation role of banks is important for economic development as capital is transferred through accepting deposits from savers to finance the borrowers' loans (Apostolik & Donohue, 2015:98; ECB, 2015). Banks, as intermediaries, differentiate borrowers and the type of borrowing products are tailor made to suit the needs of each group of borrowers (Apostolik & Donohue, 2015, p. 98).

2.1.1. Imperfect Information Theory

The imperfect information theory by Jaffee and Russell (1976) reflects a credit market model with two types of borrowers: 'honest' (always repays) and 'dishonest' (repays if it is in their interest to do so). The observed demand functions by banks for loans

are equal, making it difficult for lenders to accurately distinguish between honest and dishonest borrowers (Bank of Internationl Settlements, 2019). The cost of default varies among individuals and depends on the loan contract size (Bernanke, 2018; Jaffee & Russell, 1976). In this regard, a two-period model was assumed, and Jaffee and Russell (1976) stated that borrowers are unlikely to default in the first period, however, default is imminent in the second period whenever the second period income is less than the loan contract.

Market participants are not always straightforward about their characteristics and corporates always have 'inside' information with regard to projects that they seek to finance through a loan (Brealey, Leland and Pyle, 1977). Loan contracts have terms and conditions, such as collateral, to reduce the likelihood of default, but Jaffee and Stiglitz (1990:842) state that collateral can only reduce the probability of default but it does not eliminate default risk. Bernanke (2018) further stated that the entrepreneurs who seed large equity in their business have less intrusion from lenders. Thus banks that approve loans which have higher collateral have fewer incentives for robust credit assessments and screening at loan approval stage as compared to loans that do not have collateral (Jiménez and Saurina, 2004).

The credit market consists of agents that have diverse fragments of information, as markets are imperfect (Stiglitz, 2018; Jaffee & Stiglitz, 1990). If the repayment amount of the loan exceeds the cost of default, a dishonest borrower will default (Jaffee & Russell, 1976). According to Semmler (2011:35), there are difficulties in determining the likelihood that all credit advances will be repaid, as users of credit resources (borrowers) hold specific information that the suppliers of credit might not have. In the credit market, a loan is advanced based on a repayment promise with the uncertainty that the promise will be kept (Jaffee & Stiglitz, 1990). This results in adverse selection before the loan transaction is closed and a moral hazard after closing a loan transaction (Semmler, 2011:35; Plaut, 1985). In a study of information asymmetry in the Italian lending market, Crawford, Pavanini and Schivardi (2015) concluded that the degree of adverse selection is determined by two correlations: firstly, the choice of taking up credit and default, and secondly, how much credit to use and default of which both correlations are not observable to the lending institutions. Furthermore, 'bad risk' borrowers give up more of their second-period consumption by taking up debt in the first period because they know that the probability of actual payment in the second period is very small (Crawford et al., 2015; Jaffee and Rusell, 1976). Jaffee and Russell (1976) are of the opinion that if banks raise interest rates in a credit market with asymmetric information, low-risk borrowers drop out of the market. Consequently, an increase in interest rates aggravates adverse selection prompting deterioration in the quality of the pool of borrowers in banks' loan portfolios (Wang, Lee and Ko, 2020). The following section explains the deflation theory's theoretical consideration in banks credit risks.

2.1.2. Deflation Theory

In the debt deflation theory, Fisher (1933) postulates that disturbances in the debt and in the purchasing power of the monetary unit upsets nearly all the other macroeconomic variables. The economic system operates as a pendulum with two main sources of cyclical tendencies i.e. outside forces and self-generating events (Fisher, 1933). Fisher (1933) explained that the disturbances in the economic systems can be trends which are steady, haphazard disturbances which are unsteady, and cyclical tendencies which are unsteady but easily repeated. Over-indebtedness in the economy gives rise to liquidation, bank deposit contractions and liquidity problems (Bernanke, 2018; Fisher, 1933). In the debt deflation theory, Fisher (1933) pointed out a paradox: the more debtors pay, the more they owe. Thus, if the economy tips, it continues to tip; it does not correct itself until it capsizes rapidly reducing real incomes (Fisher, 1933).

During a boom cycle, investors tend to demand more credit as they are more optimistic about future returns whilst banks are optimistic about the repayment ability of debtors (Fisher, 1933). On the contrary, during a depression, both lenders and borrowers are pessimistic about the future income stream, to such a degree that creditworthiness and the repayment ability of the borrowers are affected (Fisher, 1933). The links between loan quality and macroeconomics have been studied empirically within the framework of business cycles (see Keshtgar, Pahlavani & Mirjalili, 2020). There is an unanticipated fall in relative prices of asset prices debt deflations cycle (Singh & Nadkarni, 2020). Such shocks to borrowers' net worth renders them uncreditworthy, affecting the balance sheets of financial intermediaries (Bernanke & Gertler, 1989). The debt-deflation theory states that irregular upturn in lending is accompanied by a rise in interest rates, which is the source of financial instability (Fisher, 1933). Intervention of monetary authorities to increase interest rates results in difficulties to roll over the debt, which could lead to systemic risks (Ciccarelli, Maddaloni & Peydró, 2015).

2.1.3. Utility Theory

Individuals in the loan market may borrow in perfect capital markets and seek to maximise utility subject to an income stream (Plaut, 1985). Bernanke and Gertler (1989) assert that the borrower seeks to maximise utility subject to the lender's opportunity cost of funds given by the lenders rate of return (ROR). Investment opportunities present choices that involve expected return and risk where investors make a choice over underlying assets and currencies of which the typical investor seeks to maximise expected return and minimise risk (Jorion & Khoury, 1996, pp. 247, 283). Changes in the agents' gearing preferences affect profitability and credit risk of banks (Gizycki, 2001). Lenders such as banks seek to maximise a utility function that shows a trade-off between expected return and risk (Jaffee & Russell, 1976). According to Jaffee and Russell (1976), a borrower will not repay the loan

whenever defaulting increases his or her utility, that is, if the penalty of default is less than the contracted repayment, a borrower will default.

Several similarities and differences emerge from the theories reviewed above. For instance, all the theories converge on default being a function of changing borrower circumstances. What is also evident is that the imperfect information theory (see sub-section 2.1.1) emphasises the prevalence of asymmetric information as a major source of default. On the other hand, the utility theory (see sub-section 2.1.3) postulates that variations in macroeconomic fundamentals may result in adverse changing circumstances for the borrower leading to default. Contrary to the first two theories, the deflation theory (see sub-section 2.1.3) emphasises the effect of the value of currency and cyclical changes in the economic systems as major sources of credit risk. There is no theoretical agreement on the determinants of credit risk in bank loan portfolios (see Fisher, 1933; 1976; Plaut, 1985).

2.2. Empirical Review

Financial stability is the foundation of modern macroeconomic policy; hence, the need to understand the effects of macroeconomic shocks on credit risk (Ingrao & Sardoni, 2019). Understanding the quality of financial institutions and the evaluation of any possible weaknesses is enhanced by analysing the effect of macroeconomic variables (Bernanke, 2018). The liberalisation of the capital flows accompanied by the increase in cross-border financial transactions has seen an upsurge in exchange rate fluctuations (Clark, Tamirisa, Wei, Sadikov & Zeng, 2004). Clark et al. (2004) further assert that different exchange rate regimes do not necessarily reduce exposure to exchange rate fluctuations. However, Quagliariello (2003) argues that different macroeconomic variables have different explanatory powers on financial fragility; hence, the use of a single variable analysis is an oversimplification of understanding the underlying forces of financial fragility. In a comparative analysis of the effects of macroeconomic variables on default rates in Australia and the United States (Ali & Daly, 2010) found that the same set of variables (debt, industrial production, interest rate, and GDP) triggered different default rates in the countries under study, with the American economy more sensitive to macroeconomic shocks than Australia.

The influence of macroeconomic variables on credit risk is asymmetric in different phases of the business cycle and is driven by the creditworthiness of the borrower (Bernanke, 2018; Quagliariello, 2009). Using the panel regression of five new EU members at macro level, Festić et al. (2011) found a significant transmission of macroeconomic variables to the credit quality of the banking sector portfolios. It was postulated that favourable macroeconomic conditions coincide with better repayment capabilities lowering the probability of default by economic agents, hence good quality of the portfolio of loans in the banking sector (Festić et al., 2011). According to Gizycki (2001), credit risk is a major source of risk that banks face and it has been

a major subject in terms of stringent regulatory oversight and policy debate. This observation is consistent with that by Pesaran et al. (2006).

Chaibi and Ftiti (2015) acknowledge that there are a number of factors that could influence credit risk in banks, namely macroeconomic factors, which affect the systemic credit risk and bank-specific factors which affect unsystematic risk. Adverse economic conditions, such as an unfavourable exchange rate, low or negative growth, are among the variables that affect credit risk in banks (Beck, Jakubik & Piloiu, 2015). The effect of exchange rate in an economy mainly depends on whether the economy is export or import oriented (see Beck et al, 2015; Fofack, 2005). Gizycki (2001) reiterates that bank-specific factors explain the likelihood of failure whilst the timing of failure is determined by macroeconomic factors. Interest payments in the corporate and household sector, credit growth and real estate prices are directly linked to bank profitability and risk and the macroeconomic environment has cyclical tendencies in these factors (Bernanke, 2018). Insufficient assessment of credit exposures and the default probability are also regarded as key to the major financial crisis as from 2007 (Gregory, 2010: xxii). Forward-looking ratings in the financial system can be derived by risk assessment that considers changes in the macroeconomic environment (Bernanke, 2018).

3. Data Sources and Definition of Variables

Quarterly time series data from the first quarter of 2008 to the fourth quarter of 2021 (2008Q1–2021Q4) was used for the study. The data was obtained from the South Africa Reserve Bank (SARB) (2021), the International Financial Statistics (IFS) (2021) and the World Bank (2021). The choice of the time period of the study was mainly guided by the availability of data.

In this section we also provide brief definitions of the variables used in the study. Exchange rate (EXCH) is defined as the value of one currency in terms of another. The real effective exchange rate (REER) is used as a measure of the rand exchange rate. It is the exchange value of the rand against a basket of currencies (Chaibi & Ftiti, 2015). Gross domestic product growth (GDP) measures the output of final goods and services and income within an economy, i.e. it measures the level of economic activity of the economy (Beck, Jakubik & Piloiu, 2013). Following Chaibi and Ftiti (2015), inflation (INF) is defined as the general increase in the price level, generally expressed as an annual percentage rate. The variable liquidity is defined as the financial depth or the level of monetisation in the economy (Mukoki & Mapfumo, 2015). The ratio of money supply (M2) to real GDP is used in this study as a proxy for liquidity. Finally, we define interest rate spread (INT) in accordance with the definition provided by Sheefeni (2016).

4. Methodology

This section specifies the econometric model used to analyse factors that determine credit risk in banking portfolios. A multivariate model employing the cointegration technique was applied. Pursuant to the objective of the study, EViews 13 software package was used to analyse the data using regression analysis. The data was summarised using descriptive statistics whilst correlations were analysed using correlation analysis to determine the presence of correlations between the variables as this can result in spurious regression results. All the diagnostics for time series studies were satisfied using the Augment Dick Fuller test (ADF) (see Dickey & Fuller, 1979) and the Phillips and Perron (1988) before using the Johansen–Juselius cointegration test (see Johansen & Juselius, 1990). The study estimated equation 1 as the baseline model for analysis. If cointegration is found, an error correction model (ECM) is used to test for short run relationships in the variables.

Equation 1 was estimated using linear specifications using the Johansen-Juselius cointegration test.Ali

$$Imp = \beta_0 + \beta_1 EXCH_t + \beta_2 GDP_t + \beta_3 INF_t + \beta_4 INT_t + \beta_5 L_t + \varepsilon_t \quad (1)$$

5. Empirical Analysis and Discussion

This section presents and discusses the results of the cointegration and the ECM tests.

5.1. Unit Root Tests

The augmented Dickey–Fuller (ADF) (Dickey & Fuller, 1979; 1981) and Phillips and Perron (1988) methods of the unit root test are used to determine whether the variables are stationary. Two tests were used for robustness of the results as Brooks (2014) argues that if the data generating process is stationary with a root close to non-stationary, ADF has a very low power. The unit root tests were performed on the regression model to avoid spurious results of the regression analysis and forecasting errors, as recommended by Gujarati and Porter (2009:754) and Brooks (2014). The unit root test is estimated using the following regression.

$$\Delta y_t = \psi y_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta y_{t-1} + u_t \quad 2$$

The unit root test was applied under the following hypothesis:

H_0: $\rho = 1$ (The time series has a unit root)

H_a: $\rho \neq 1$ (The time series has no unit root).

Table 1 presents the results of the unit root tests. All the variables were stationary after first differencing.

Table 1. Results of Unit Root Tests

Variable	Model specification	Augmented Dickey–Fuller		Phillips–Perron		Order of integration
		Level	1st difference	Level	1st difference	
Imp	Intercept	-2.2161	-1.9858	-2.3634	-2.8611	
	Intercept and trend	-4.1384**	-1.6537	-5.4034***	-1.2096	I(0)
EXCH	Intercept	-5.8917***	-8.2222***	-5.9224***	-13.541***	
	Intercept and trend	-6.0500***	-8.1094***	-6.0840***	-14.743***	I(0)
GDP	Intercept	-3.4175**	-5.3681***	-3.1969**	-10.791***	
	Intercept and trend	-3.3533*	-5.3733***	-3.1205	-9.6525***	I(1)
INF	Intercept	-1.7052	-4.3537***	-1.7852	-4.3305***	
	Intercept and trend	-1.5640	-4.5067***	-1.7282	-4.4938***	I(1)
INT	Intercept	-4.0524***	-7.8618***	-4.0608***	-9.6306***	
	Intercept and trend	-3.9482**	-7.9248***	-3.7993**	-9.5935***	I(1)
L	Intercept	2.8255	-1.9137	1.0080	-7.4164***	
	Intercept and trend	-1.0254	-4.8049***	-1.7650	-12.4354***	I(1)

*Notes: ***, **, * denotes significance at 1%, 5% and 10% respectively.*
Source: EViews 13.

5.1.2 Cointegration Test

After establishing that the variables were integrated of order one I(1), the Johansen–Juselius (1990) technique (see Johansen & Juselius, 1990) was used to determine the relationship between impaired assets of bank loan portfolios and the selected macroeconomic variables. The Johansen cointegration test statistic shows that impaired advances, real effective exchange rate, GDP growth, liquidity, interest rate spreads and inflation have a long-run association, that is, they move together in the long run. Tables 3 and 4 show the results of the trace test statistic and the maximum eigenvalue respectively. The trace statistic has two cointegrating equations (CEs) whilst the maximum eigenvalue statistic shows that there is one cointegrated equation in the model (see Tables 2 and 3).

Table 2. Unrestricted Cointegration Rank Test (Trace)

Hypothesised number of CEs	Eigenvalue	Trace statistic	0.05 critical value
None*	0.842181	154.5386	117.7082
At most 1*	0.721163	99.14950	88.80380
At most 2	0.582531	60.83565	63.87610
At most 3	0.387560	34.62931	42.91525
At most 4	0.336878	19.92016	25.87211
At most 5	0.223694	7.596274	12.51798
Trace test indicates 2 cointegrating equations at the 0.05 level			

Source: Eviews 13

Table 3. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesised number of Ces	Eigenvalue	Maximum eigenvalue statistic	0.05 critical value
None*	0.842181	55.38912	44.49720
At most 1	0.721163	38.31386	38.33101
At most 2	0.582531	26.20634	32.11832
At most 3	0.387560	14.70915	19.38704
At most 4	0.336878	12.32389	19.38704
At most 5	0.223694	7.596274	12.51798
Maximum eigenvalue test indicates 1 cointegrating equation at the 0.05 level			

Source: EViews 13

The trace and the maximum eigenvalue statistic show conflicting results in terms of the number of cointegrating equations in the model. According to Enders (2015:380), maximum eigenvalue alternative hypothesis is sharper than the trace alternative hypothesis; thus, maximum eigenvalue is preferred when deciding on the number of cointegrating equations. In estimating the ECM model, the maximum eigenvalue test, which indicates one CE, was therefore applied.

The long-run relationship of the variables reflects that the cumulative effect of the variables is important (Koju et al, 2019). The results from the long-run estimation of the model in Table 4 show that all the variables, except liquidity, significantly affect credit risk in banks. The cointegration result of GDP growth and interest rate spread, which had positive and negative signs in the long run respectively, were however a surprise as the signs of the coefficients were not expected. According to Stats SA (2016), measuring economic relationships can be complex. The presence of lags may distort the response time by economic agents to changes in the macroeconomic environment.

Table 4. Long-Run Analysis

Dependent variable: IMP	
	Coefficient [t-statistics]
Constant	-0.038649
Exch	-0.324569 [-11.8022]***
GDP_growth	0.253346 [5.59112]***
L	0.021515 [1.10017]
Int	-2.988162 [-3.31088]***
Inf	0.349873 [7.12359]***
R-squared	0.831829
Adjusted R-squared	0.778320
F-statistic	15.54564
Durbin–Watson statistic	1.668766

****, **, * denotes significance at 1%, 5% and 10% respectively*
Source: EViews 13

For this study an increase/decrease in GDP growth increases/decreases impaired loans by 25% in the long run. Although this was not expected for GDP growth, the results are consistent with the findings of De Lis, Pagés and Saurina (2001). Rising consumer wealth might entice consumers to take more debt irrespective of low economic growth as economic agents may feel secure and increase their standard of living (SARB, 2016). The effect of an increase in wealth explained above could result in falling debt servicing risk, which might be reflected by low impaired loans in periods of subdued economic growth, but the risk increases as consumers take more loans during periods of high real GDP growth. Impaired loans could thus be positively associated with growth in the GDP.

Another explanation might be that in a period of high economic growth in an environment where banks have deposit insurance, moral hazard could increase as banks increase their risk appetite by issuing credit to high-risk clients (Erdinç & Abazi, 2014). For the cointegration test, the interest rate spread had an unexpected negative relationship with impaired loans. This can be explained by the fact that in an environment where banks have strong market power, they could adjust the interest rate spread to cushion their profit from the increased risk (Jamaludin, Klyuev & Serechetapongse, 2015). Alternatively, uncertainty and risk aversion in the market, which was triggered mainly by political uncertainty, might have reduced the banks' capacity to issue new loans or firms withholding future investment projects (Institute of International Finance, 2015; SARB, 2016).

Since the Johansen–Juselius test showed that there was cointegration in the model, the ECM was estimated, and the results are presented in Table 5 below. Only the results of the significant variables after parsimonious process are reported in the ECM.

5.1.3. Error Correction

After cointegration was found an error correction equation 3 below was estimated and the results are presented in Table 6.

$$\Delta imp = c + \beta_1 \Delta imp(-1) + \beta_2 \Delta imp(-2) + \beta_3 \Delta exch(-1) + \beta_4 \Delta exch(-2) + \beta_5 \Delta GDP\ growth(-1) + \beta_6 \Delta GDP\ growth(-2) + \beta_7 \Delta L(-1)) + \beta_8 \Delta L(-2) + \beta_9 \Delta Int(-1) + \beta_{10} \Delta Int(-2) + \beta_{11} \Delta inf(-1) + \beta_{12} \Delta inf(-2) + \lambda\ ECT(-1) + \varepsilon_t \quad (3)$$

where Δ is the first difference operator, λ the speed of adjustment parameter and ECT the error correction term.

Table 5. Error Correction Model

Independent variables	Coefficient (t-statistic)
Constant	-0.000834 [-1.89107]*
Δimp(-1)	0.912709 [2.96427]***
Δexch(-1)	-0.016915 [-2.57578]**
ΔGDP growth	-0.022351 [-1.59307]
Δ L(-1)	0.018176 [3.00546]***
Δ int(-1)	0.464953 [1.98627]*
ECT(-1)	-0.118532 [-3.23060]***
R-squared	0.912966
Adjusted R-squared	0.837536
F-statistic	12.10352
Durbin–Watson statistic	2.196361

*Notes: ***, **,* denotes significance at 1%, 5% and 10% respectively and the t-statistics in parenthesis*
Source: EViews 9.5

The ECT was negative and significant at 1% level. This implies that the speed of adjustment of the model to its equilibrium after disequilibrium was 11.85% within a year. Previous period credit risk was positively correlated with the current period credit risk and it was highly significant at 1% level, which was consistent with the findings by Erdinç & Abazi (2014) and Akinlo & Emmanuel (2014).

6. Conclusion

The main objective of the study was to determine the effect of exchange rate volatility on credit risk in banking portfolios in South Africa. The study concluded that exchange rates influence the performance of banking loan portfolios. A depreciating rand results in improved cash flows for most exporting companies, thus improving their debt servicing capacity. Inversely, an appreciating rand leads to an increase in impaired assets as the rand appreciation constrains the international competitiveness by making domestic goods more expensive. Subdued demand for domestic products negatively

affects the balance sheet of domestic consumers resulting in an increase in credit risks. Based on these observations, it is evident that the exchange rate variability affects the loan portfolio default risk via its positive or negative influence on obligor cash flows. Since this paper covered the aggregate bank credit portfolio, further research is recommended at sectoral level.

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