

IS FINANCIAL DEVELOPMENT STILL A SPUR TO ECONOMIC GROWTH? A CAUSAL EVIDENCE FROM SOUTH AFRICA

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1. Introduction

South African banking sector was initially meant to provide the farmers with short-term and later long-term credits. The long-term credits were supplied by Bank Van Leening, which was established by the Dutch East Indian Company in 1793. The short-term credits were supplied by the Lombard Discount, founded by the British in 1808. Later, the so-called era of "free banking" or private banking emerged. The first bank to be established during this era was called the Cape of Good Hope Bank, which was established in 1836. The private banks during this era were mainly unit banks or "one-office banks". They were small, local banks with little financial expertise.

During the second half of the 19th century, the so-called "imperial banks" found their way to South Africa. These included the Standard Bank of British SA LTD in 1862 and the Netherlands Bank of SA in 1888. Later, two more banks appeared, namely Barclays National Bank LTD (1926) and Volkskas Bank (1934). The emergence of these large banks, together with their extensive branch networks, resulted in the virtual disappearance of "unit banks". Between the mid-1960s and 1980s, private banking activities in South Africa and the development of the securities markets were restricted by the extensive use of direct monetary control instruments. Credit ceiling was increasingly used in order to allow the Reserve Bank to curtail overspreading and dampening inflation. During this period, high cash-reserves were also instrumental in the development of "grey" markets (see SA Financial Sector Forum, 1997)

During the mid-1980s, after the implementation of the De-Kock Commission recommendations, South African Banks were challenged by the increasing adherence to free market principles by the monetary authorities. The deregulation and rationalisation took place on a major scale and most of the direct control instruments were no longer used by the end of the 1980s. By the 1990s, nearly all building societies were transferred from mutual societies into banking institutions, which in turn merged into larger banking groups. By the mid 1990s, more than 95% of the total assets of banks were held by only four banking groups, namely Amalgamated Bank of South Africa (ABSA), Standard Bank, First National Bank and Nedbank. The remaining 5% of these assets were, however, spread among some 27 local banks, 9 foreign controlled banks and a few branches of foreign banks and some mutual banks. Although the policy of the South African authorities for many years was to ban the entry of new foreign banks into the country, this policy was reversed under the Deposit Taking

Institution Act of 1990, also known as the Bank Act of 1993. During this period, the shareholding restrictions on foreign banks operating in South Africa were removed. In addition, other restrictions on the entry of new foreign banks were lifted (see Falkena, H.B et al, 1995; and SA financial sector forum, 1997).

As from the 1980s, the distinctions among the various classes of financial institutions in South Africa faded considerably. This was mainly due to several amalgamations and takeovers involving banks and building societies. Likewise, the discount houses moved closer to other banking institutions. From January 1991, building societies, commercial banks, discount houses, general banks and merchant banks were grouped together to form banking institutions which were regulated by the Banks Act of 1990. This Act stipulates certain prudential requirements to be followed by banks. These include requirements in respect of capital, cash reserves, liquid assets, and large exposures (see also South Africa Year Book, 1995).

Judging by the standards of developing countries, South Africa is considered to have one of the most developed and sophisticated financial systems in sub-Saharan Africa. By 1997, South Africa had about 51 licensed banks. In addition, there were five mutual (community) banks. Of the 51 licensed banks, 8 were branches of foreign banks, while 11 were subsidiaries of foreign banks. By the year 2000, there were about 60 banks, out of which 13 were branches of foreign banks. Besides, about 57 foreign banks had authorized representative offices in South Africa during the same period¹.

2. Measurement of Financial Development and Economic Growth Variables

The quantitative measurement of both financial development and economic growth variables are bound to be imperfect since these developments are multi-dimensional and qualitative. In particular, the measurement of financial development seems more controversial because countries differ considerably in both their institutional and financial structures.

In this study, economic growth is proxied by real per-capita income (y/N) while

¹ For more details on the historical development of banking in South Africa, see Falkena, H.B et al, 1995; SA Financial Sector Forum (various issues) and South Africa Official Year Book (various issues).

financial development is proxied by three variables. The first proxy for financial development is the ratio of broad money (M_2) to gross domestic product (GDP). The monetisation variable (M_2/GDP) is designed to show the real size of the financial sector of a growing economy. The ratio is therefore expected to increase over time if the financial sector develops faster than the real sector on the one hand, and decrease if the financial sector develops slower than the real sector, on the other hand.

The second measure of financial development employed in the study is the currency ratio, defined as the ratio of currency to the narrow definition of money M_1 (i.e. the sum of currency and demand deposit). The motivation for including currency ratio in this study is because the variable is normally used as proxy for the complexity of the financial structure (see for example Wood, 1993; Vogel and Buser, 1976). At early stages of the economy, a decrease in the currency ratio will accompany real growth since there will be more diversification of financial assets and liabilities within the economy and more transactions will be carried in non-currency.

The third indicator of financial development is represented by the ratio of bank claims on the private sector to nominal GDP (DCP/GDP). This ratio indicates the importance of the role played by the financial sector in financing the economy. It is assumed that credit provided to the private sector generates increases in investment and productivity to a much larger extent than do credits to the public sector. It is also assumed that loans to the private sector are given more stringently and that the improved quality of investment emanating from financial intermediaries' evaluation of project viability is more significant for private sector credit (see Kar and Pentecost, 2000). The three proxies, the monetisation variable (M_2/GDP), the currency ratio (CC/M_1) and the ratio of bank claims on the private sector to nominal GDP (DCP/GDP) are expected to capture both quantitative and qualitative development of the financial sector in the study country.

3. Supply-Leading versus Demand-Following Response

For a long time, it has been assumed that financial development is important for and leads to economic growth (supply leading phenomenon). Little has been discussed on the converse, where economic growth can also drive the development of the

financial sector, i.e. demand-following effect. However, in practice, there is likely to be an interaction between supply-leading and demand-following phenomenon.

Patrick's (1966) hypothesis argues that the direction of causality between financial development and economic growth changes over the course of development. In his view, financial development is able to induce real innovation for investment before sustained modern economic growth gets underway and, as modern economic growth occurs, the supply leading impetus gradually becomes less and less important as the demand-following financial response becomes dominant. As Patrick puts it, this sequential process is also likely to occur within and among specific industries or sectors. For instance, one industry may initially be encouraged financially on a supply-leading basis and as it develops, have its financing shift to demand-following, while another may remain in the supply-leading phase. This shift would be more related to the timing of the sequential development of industries, particularly in cases where the timing is determined more by government policy than by private demand forces (Patrick, 1966:177).

According to the demand-following phenomenon, lack of financial growth is a manifestation of lack of demand for financial services. Therefore, as the real side of the economy develops, its demands for various new financial services materialise, and these are met rather passively from the financial side. In the second view, called the supply-leading phenomenon, the financial sector precedes and induces real growth by channeling scarce resources from small savers to large investors according to the relative rate of return (see also Woo, 1986).

4. Selected Empirical Literature

The relationship between financial development and economic growth has recently received emphasis from numerous empirical works. Three groups exist in the literature. The first group argues that financial development leads to economic growth (supply-leading response). The second group maintains that it is economic growth which leads to the development of financial sector (demand-following response). The third group, however, contends that both financial development and economic growth granger cause one another (bi-directional causal relationship). The empirical work, which is consistent with a distinct supply-leading response, includes studies such as: Choe and Moosa (1999); Rajan and Zingales (1998); De Gregorio and Guidotti (1995); King and

Levine (1993); Crichton and De Silva (1989); and Woo (1986) among others.

Choe and Moosa, for example, while examining the relationship between the development of financial systems and economic growth in Korea, conclude that financial development in general leads to economic growth and that financial intermediaries are more important than capital markets in this relationship (Choe and Moosa, 1999). Rajan and Zingales investigate whether financial development facilitates economic growth by scrutinising the rationale that financial development reduces the costs of external finance to firms. The results of their study suggest that financial development has a substantial supportive influence on the rate of economic growth. The study specifically finds that industrial sectors which are relatively more in need of external finance develop disproportionately faster in countries with more developed financial markets (Rajan and Zingales, 1998). Likewise, De Gregorio and Guidotti, while examining the empirical relationship between financial development and economic growth, conclude that, by and large, financial development leads to improved growth. The authors, however, reiterate that the effects vary across countries and over time (De Gregorio and Guidotti, 1995). King and Levine used an endogenous growth model to examine how financial systems affect economic growth. According to the findings of this study, better financial systems improve the possibility of successful innovation, thereby accelerating economic growth. Similarly, financial sector distortions reduce the rate of economic growth by reducing the rate of innovation. The study therefore concludes that financial systems are important for productivity, growth and economic development (King and Levine, 1993). Crichton and De Silva, while examining the progress of financial intermediation resulting from economic growth in Trinidad and Tobago, find that there is a definite positive correlation between economic growth and financial development, between 1973-1982 at least. However, the study concludes that "while changes in the real sector clearly impacted on the financial system, it is not clear to what extent financial intermediaries may have in turn aided the growth process through their ability to allocate savings efficiently to the most productive sectors of the economy" (Crichton and De Silva, 1989). Adewunmi conducts a study to find out how efficiently the Nigerian commercial banks operate their loan functions and how this contributes towards general economic development. While investigating the relationship between the monetary and the real sector, the author found a strong relationship between the monetary and the real sector of the Nigerian economy, which also implies that money matters in Nigeria (Adewunmi, 1981). Other empirical studies, which conclude that financial development provides a significant contribution to growth include

Levine (1997), Levine, *et. al.* (2000), and Temple (1999).

Despite the overwhelming arguments in favour of supply-leading a number of studies such as Akinboade (1998), Wood (1993), Woo (1986), Hyuha (1982, 1984) among others, have revealed that financial development and economic growth can granger cause one another. Akinboade (1998) for example, while examining the direction of causality between financial development and related growth in Botswana during the period 1972-1995, finds evidence of a bi-directional causality between financial development and per capita income. The author concludes that economic and financial development in Botswana appear to complement one another. Wood (1993) examines the causal relationship between financial development and economic growth in Barbados during 1946-1990 period. Using Hsiao's (1979) test procedure, the author finds a bi-directional causal relationship between financial development and economic growth. The study however, finds no support for Patrick's hypothesis. Woo (1986) investigates the international evidence on the causal relationship between financial development and economic growth using annual data from 56 countries. Using both simple and unidirectional concepts of causality, the author finds evidence of supply-leading pattern to be more frequent in less developed countries (LDCs) than demand-following pattern. According to the results of this study, LDCs are characterised by the causal direction running from financial development to economic growth, while developed countries are characterised by the reverse causal direction regardless of which causality concept is employed. Based on Uganda's experience, Hyuha (1982, 1984) found financial liberalisation in Uganda to be both supply-leading and demand-following, therefore conforming to a bi-directional causality pattern. Kar and Pentecost (2000) examine the causal relationship between financial development and economic growth in Turkey. The authors used five alternative proxies for financial development in order to see the impact of different aspects of financial development in Turkey. The Granger Causality Test was then applied in the context of a cointegration and vector error-correction mechanism. The empirical results of the study show that the direction of causality between financial development and economic growth is sensitive to the choice of measurement for financial development in Turkey. Although this study reveals that the strength of the causality between financial development and economic growth is much weaker than that between economic growth and financial development, the authors conclude that "..... it would be inconsistent with the results obtained to argue that for all intents and purposes in Turkey, economic growth leads financial development" (Kar and Pentecost, 2000:9).

5. Estimation Technique

In this section, the estimation technique used to examine the causal relationship between financial development and economic growth is presented. The study uses cointegration and error-correction model to examine the direction of causality between financial development and economic growth. Granger (1988) argues that if a set of variables is stationary or cointegrated, causality test can be conducted. The Granger causality test method is chosen in this paper over other alternative techniques because of its favourable response to both large and small samples. Guilkey and Salemi (1982) and Geweke, Meese, and Dent (1983) have all shown that the Granger test outperforms other methods in both large and small samples. Other alternative test procedures, which have been suggested in the literature, include: Sims (1972), Pierce and Haugh (1977) and Geweke (1981) among others.

The conventional Granger causality test involves the testing of the null hypothesis that FD_t does not cause Y_t , and vice versa, by simply running the following two regressions:

$$Y_t = \mu + \sum_{i=1}^m \alpha_{1i} Y_{t-i} + \sum_{j=1}^n \beta_{1j} FD_{t-j} + n_1 \quad (1)$$

$$FD_t = \beta + \sum_{i=1}^m \alpha_{2i} Y_{t-i} + \sum_{j=1}^n \beta_{2j} FD_{t-j} + n_2 \quad (2)$$

Where: Y_t = economic growth variable; FD = financial development variable; n_1 , n_2 = white noise error process; m , n = denote the number of lagged variables.

The Null hypothesis that FD_t does not Granger cause Y_t is rejected if B_{js} are jointly significant (Granger, 1969).

However, the traditional causality tests suffer from the following two methodological deficiencies. First, these standard tests do not examine the basic time series properties of the variables. If the variables are cointegrated, then these tests incorporating differenced variables will be miss-specified unless the lagged error-correction term is included (Granger, 1988). Second, these tests turn the series stationary

mechanically by differencing the variables and consequently eliminating the long-run information embodied in the original form of the variables.

As opposed to the conventional Granger causality method, the error-correction based causality test allows for the inclusion of the lagged error-correction term derived from the cointegration equation. By including the lagged error-correction term, the long-run information lost through differencing is re-introduced in a statistically acceptable way.

The error-correction model used in the current study is based on the following equations:

$$\Delta Y_t = \partial_{11} + \sum_{i=1}^n \partial_{1i} \Delta Y_{t-i} + \sum_{j=1}^m \psi_{1j} \Delta FD_{t-j} + \lambda_1 Z_{t-1} + e_{t1} \quad (3)$$

$$\Delta FD_t = \partial_{22} + \sum_{i=1}^n \partial_{2i} \Delta Y_{t-i} + \sum_{j=1}^m \psi_{2j} \Delta FD_{t-j} + \lambda_2 Z_{t-1} + e_{t2} \quad (4)$$

Where

Z_{t-1} = represent one period lagged error correction term captured from the cointegration regression.

FD_t = represent the three proxies of financial development, i.e. monetisation variable (M_2/GDP), the currency ratio (CC/M_1), and the ratio of bank claims on the private sector to nominal GDP (DCP/GDP).

Y_t = represent per capita income (y/N) - economic growth variable.

In the error-correction based causality test, the causal inference is obtained through the significance of λ , that is, the null hypothesis that FD_t does not Granger cause Y_t is rejected if λ is statistically significant (Granger, 1988). As opposed to the conventional Granger (1969) causality, it is immaterial even if ψ_j is not jointly significant. The error-correction model has an interesting temporal causal interpretation in the sense that a bivariate cointegrated system must have a causal ordering in at least one direction (Engle and Granger, 1987: 259).

5.1 Data source

The study utilises annual time series data, which covers the period 1968 to 2000. The data used in the study is obtained from different sources, which include different volumes of International Financial Statistics (IFS) Yearbooks, various issues of the South African Reserve Bank Bulletin, World Bank publications etc.

5.2. Analysis of the Long-run Causality Test

5.2.1 Stationarity Tests

Just like in other time series data, the variable economic growth (y/N) and the proxies for financial development, $M2/GDP$, $CC/M1$, and DCP/GDP are tested for stationarity before running the causality test. The results of stationarity tests at level are reported in Table 1.

Table 1: Stationarity Tests of all Variables at Levels

Variable	DW	SBDW	DF	ADF	Stationarity Status
Ly/N	2.000	0.690	0.055	-0.209	I (1)
$LM2/GDP$	2.290	0.037	-6.681	-1.023	I (1)
$LCC/M1$	2.060	2.268	-2.619	-1.169	I (1)
$LDCP/GDP$	2.300	0.018	0.972	-1.611	I (1)

Critical values: 1% level: $DF = -4.32$, $ADF = -4.12$; 5% level: $DF = -3.67$, $ADF = -3.29$; 10% level: $DF = -3.28$, $ADF = -2.90$.

As shown in Table 1 the DF , ADF , and $SBDW$ show that all variables included in the causality model are non-stationary at level. The next step, therefore, is to difference all the variables once in order to perform stationary tests on differenced variables as presented in Table 2.

Table 2: Stationarity Tests on First Difference

Variable	DW	SBDW	DF	ADF	Stationarity Status
DLy/N	1.970	1.759	-4.678	-4.176	I (1)
$DLM2/GDP$	1.990	2.810	-6.825	-3.876	I (1)
$DLCC/M1$	2.160	3.000	-9.021	-5.451	I (1)
$DLDCP/GDP$	1.940	2.604	-6.518	-3.527	I (1)

Critical values: 1% level: $DF = -4.32$, $ADF = -4.12$; 5% level: $DF = -3.67$, $ADF = -3.29$; 10% level: $DF = -3.28$, $ADF = -2.90$.

The results reported in Table 2 indicate that the DF, ADF and SBDW tests confirm that all variables became stationary after being differenced once. It is therefore concluded that the variables are integrated of order one.

5.2.2 Cointegration Analysis

Having confirmed that all variables included in the causality test are integrated of order one, the next step is to independently test the existence of the cointegration relationship between each of the proxies for financial development (M2/GDP, CC/M1 and DCP/GDP) and real GDP per capita (y/N). For this purpose, the study uses the Johansen-Juselius (maximum likelihood) cointegration test procedure. If cointegration is detected between these variables, then the existence of Granger causality in either way cannot be ruled out. The results of Johansen-Juselius cointegration test are presented in Tables 3².

Table 3: Maximum Likelihood Cointegration Test

Trace Test				Maximum Eigenvalue Test			
Null	Alternative	Statistics	95% Critical value	Null	Alternative	Statistics	95% Critical value
Cointegration Between Ly/N and LM2/GDP							
$r = 0$	$r \geq 1$	29.18	15.4	$r = 0$	$r = 1$	29.05	14.1
$r \leq 1$	$r = 2$	0.1332	3.8	$r \leq 1$	$r = 2$	0.1332	3.8
Cointegration Between Ly/N and LCC/M1							
$r = 0$	$r \geq 1$	49.65	15.4	$r = 0$	$r = 1$	49.18	14.1
$r \leq 1$	$r = 2$	0.4649	3.8	$r \leq 1$	$r = 2$	0.4649	3.8
Cointegration Between Ly/N and LDCP/GDP							
$r = 0$	$r \geq 1$	29.18	15.4	$r = 0$	$r = 1$	29.05	14.1
$r \leq 1$	$r = 2$	0.1332	3.8	$r \leq 1$	$r = 2$	0.1332	3.8

Notes:

1) r stands for the number of cointegrating vectors

2) The lag structure of VAR is determined by the highest values of the Akaike information criterion and Schwartz Bayesian Criterion.

The results of the Johansen-Juselius cointegration tests reported in Table 3 indicate the existence of a stable long-run relationship between the various proxies for financial development indicators and the real GDP per capita. Both the trace test and the maximum eigenvalue statistics reject the null hypothesis of no cointegration.

² The Akaike and Schwarz criteria were used to determine the number of lags for the cointegration test.

Specifically, the results show that there is one cointegrating vector between Ly/N and $LM2/GDP$; one cointegrating vector between Ly/N and $LCC/M1$; and one cointegrating vector between Ly/N and $LDCP/GDP$.

5.3 Results of Causality Test Based on Error Correction-Model

Although cointegration indicates the presence of Granger causality in at least one direction, it does not indicate the direction of causality between variables. The direction of the Granger causality can only be detected through the vector error-correction mechanism (VECM). In addition to indicating the direction of causality amongst variables, the VECM enables us to distinguish between short-run and long-run Granger Causality. The F-test of the explanatory variables indicates the "short-run" causal effects, while the "long-run" causal relationship is implied through the significance of the t-test of the lagged error-correction term. The results of the error-correction model between the various proxies of financial development and economic growth are displayed in Table 4.

Table 4: Error-correction Model: Causality Test Between DLy/N and DLM_2/GDP

Variables in equation	Dependent Variables	
	$\Delta Ly/N$	$\Delta LM_2/GDP$
$\Delta Ly/N-1$	-0.0794 (-0.249)	-
$\Delta Ly/N-4$	-	0.4076 (1.656)*
$\Delta LM_2/GDP-1$	-0.0335 (-0.124)	-
$\Delta LM_2/GDP-2$	-	0.6330 (2.703)**
ECM_{t-1}	(0.995)	(-2.483)**
F-Test	0.594 (0.7915)	3.3995 (0.2511)
R^2	0.45	0.97
DW	1.90	2.10

Causality Test Between DLy/N and $DLCC/M1$

Variables in equation	Dependent Variables	
	$\Delta Ly/N$	$\Delta LCC/M1$
$\Delta Ly/N-4$	0.9681 (1.579)	62.702 (1.948)*
$\Delta LCC/M1-1$	0.0263 (0.740)	5.454 (1.535)
ECM_{t-1}	(0.853)	(-1.603)*
F-Test	0.9045 (0.6242)	1.34 (0.3980)
R^2	0.83	0.79
DW	2.22	2.21

Causality Test Between DLy/N and DLDCP/GDP

Variables in equation	Dependent Variables	
	$\Delta Ly/N$	$\Delta LDCP/GDP$
$\Delta Ly/N-1$	-0.1546 (-0.545)	-
$\Delta Ly/N-6$	-	0.8069 (2.096)**
$\Delta LDCP/GDP-2$	-	0.4001 (2.392)**
$\Delta LDCP/GDP-4$	-0.1445 (-0.986)	-
ECM_{t-1}	(0.879)	(-2.545)**
F-Test	0.7270 (0.6673)	3.23 (0.0788)
R ²	0.35	0.88
DW	2.27	2.65

The results reported in Table 4 reveal that for the causality between DLy/N and DLM_2/GDP , there is a one directional causality running from DLy/N to DLM_2/GDP . As reported, both the error-correction term and the F-statistics are insignificant in the DLy/N equation, but statistically significant in the DLM_2/GDP equation. This shows that for South Africa, DLy/N causes DLM_2/GDP both in the short- run and long-run.

For the causality between DLy/N and $DLCC/M1$, the error-correction term in the DLy/N equation rejects the causality from $DLCC/M1$ to DLy/N . The error-correction term is positive and statistically insignificant. However, the causality from Ly/N to $DLCC/M1$ is accepted in the $DLCC/M1$ equation. Both the F-statistics and error-correction term in the $DLCC/M1$ equation are significant, although the latter is only significant at 10%. It is therefore concluded that for DLy/N and $DLCC/M1$, the causality runs from DLy/N to $DLCC/M1$ both in the short-run and long-run.

Finally, the causality test between DLy/N and $DLDCP/GDP$ shows that the direction of causality is from DLy/N to $DLDCP/GDP$. The error-correction term in the $LDCP/GDP$ equation is negative and statistically significant. Likewise, the F-statistics in the $LDCP/GDP$ equation is statistically significant. This implies that for South Africa, the direction of the long-run causality is from DLy/N to $DLDCP/GDP$.

A summary of the long-run causality tests between the three proxies of financial development and economic growth are presented in Table 5.

Table 5: Summary of Causality Test

Variables	Long-run Causality	General Response
$\Delta Ly/N$ and $\Delta LM2/GDP$	- Economic growth Granger causes financial development.	- Demand – Following response.
$\Delta Ly/N$ and $\Delta LCC/M1$	- Economic growth Granger causes financial development.	- Some evidence of Demand – Following response.
$\Delta Ly/N$ and $\Delta LDCP/GDP$	- Economic growth Granger causes financial development.	- Demand – Following response.

6. Conclusion

In this study, the direction of causality between financial development and economic growth is investigated using South African time series data. Three proxies of financial development are used against real GDP per capita, a proxy for economic growth. The study uses Johansen-Juselius cointegration technique and vector error correction mechanism. Based on the foregoing results, the study reveals that the wholesale supply-leading hypothesis has been rejected in South Africa. Indeed, there is an overwhelming demand-following response between financial development and economic growth in South Africa. This applies irrespective of the measurement for financial development. This implies that, for South Africa, it is the economic growth which drives the development of financial sector. The study therefore recommends that the real sector of the economy should be developed further in order to stimulate further development in the economy.

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Abstract

The direction of causality between financial development and economic growth has recently received emphasis from numerous empirical works in sub-Saharan African countries. For a long time, it has been assumed that financial development is important for and leads to economic growth (supply-leading phenomenon). Little has been discussed on the converse, where economic growth can also drive the development of financial sector (i.e. demand-following phenomenon). This study takes a fresh look at the direction of causality between financial development and economic growth in South Africa. Using three proxies for financial development against real GDP, the study finds a demand-following response to prevail in South Africa. This applies irrespective of whether the model is estimated in a static long-run formulation (cointegration model) or in the dynamic formulation (error correction model).