

## **PART III**

THE GLOBAL CRISIS IN AFRICA:  
PROFILES AND RESPONSES FROM COUNTRIES AND  
ECONOMIC SECTORS



# 5

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## African Stock Exchanges: Does Integration with the Global South Reduce Susceptibility to Financial Crisis?

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### Introduction

The 2008 global financial crisis, which started in 2007 with the housing market crash in the United States of America, had consequences for emerging and developing economies. While emerging stock markets in Africa were affected by the impact of the crisis, Asian stock markets were not spared. This situation further fueled debates on rethinking Africa's integration with the West (the global North) while it expanded the frontiers on the benefits that could accrue to countries of the global South if they were better integrated (e.g. Amin 2011, 2012). Prior to 2008, there were some doubts about whether African countries would not be affected by the crisis. As events unfolded, it became clear that Africa was not spared from the adverse impact of the global financial crisis as economic growth plummeted and Africa's largest economy, South Africa, got into recession for the first time since 1992 (IMF 2009). Within this period, however, China and Japan recorded mixed performance in their economy, while countries like Mexico and South Korea though with similar economic structures, responded differently depending on their exposure to the economies of the US and UK (see Park 2009).

As the West struggled with the financial crisis, they implemented policies that aimed at cushioning its impact (Amin 2011). The effectiveness of the policies, however, is questionable as it led to huge national debt that threw the Eurozone in crisis, kept the US on the verge of a fiscal cliff, while African countries (despite policy measures taken to cushion the impact of the crisis),

have continued to deal with asset management issues in the banking sector, issues of forbearance in the capital market and increasing need for external borrowing to invest in critical infrastructure, stimulate growth and create employment. While studies (e.g. Ariyo and Fawowe 2009; Ackah et al 2009; Amin 2011, 2012) have debated normatively on whether the susceptibility of African countries to external shocks would reduce if integration with the global South is deepened or not, empirical evidence on the subject matter is lacking. The benefit of such empirical evidence is that it provides estimates on the extent to which countries were affected by the global financial crisis and how the degree of susceptibility would change if integration patterns were tilted towards the global South. Such evidence would be useful not only for country-specific policies on whether or not to maintain the path of globalization and in what pattern, but also for regional blocs like ECOWAS, for instance, to consider collaborative efforts with the MERCOSUR region and Africa to further consider possibilities of increased economic ties with Asia and Latin America or not. The aim of this chapter, therefore, is to examine the direction and degree of susceptibility of African stock markets with the US/UK and for African stock markets with Asia. Some reflections on how stock markets aid the spread of financial crises and lessons from China's experience during the 2008 global financial crisis are also provided.

This chapter is arranged into six sections. Section one presents the introduction, problem statement and objectives of the chapter. Section two discusses the theoretical and empirical literature. In section three, the research methodology is presented while the results from analysis of data are discussed in section four. Section five presents some reflections on how stock markets aid the spread of financial crises and lessons deduced for the global South from China's experience during the 2008 global financial. Lastly, section six presents the summary and conclusion of the chapter.

## **Literature Review**

Debates on the benefits of globalization and capitalism have been the subject matter of many authors such as Samir Amin and Joseph Stiglitz in the last three decades. While advocates of capitalism argue that the market is self-correcting and financial crisis only represents a normal attribute of the market system, opponents on the other hand, have continued to see each episode of the financial crisis emanating from the West as a sign of the collapse of capitalism and as an anchor for a paradigm shift in favour of stronger integration among countries of the global South (see, for instance, Amin 2011, 2012; O'Neill 2011). From these debates, a simple question comes to mind: would the integration of economies in the global South reduce their susceptibility in times of financial crisis to external shocks? Although this

question can be examined by an overview of historical trend on every episode of financial crises across countries, the focus on the 2008 financial crisis in the present chapter offers the choice of examining whether countries integrated with the global North or global South were affected by the crisis and to what extent their degree of susceptibility would vary on integration with the global North or South. One framework of carrying out such estimation in econometrics is via cointegration analysis (see Johnston and Dinardo 1997).

According to Engle and Granger (1987), the close linkage between cointegration and the error correction model stems from the Granger representation theorem which states that two or more integrated time series that are cointegrated have an error correction representation. On the reverse side, two or more time series that are error-correcting are, likewise, cointegrated. While there are several methods of estimating cointegration, the Engle and Granger approach is appraised for its simplicity (see Greene 1997, for instance) especially if the variables are first difference stationary. Stock market indices exhibit such a characteristic; hence the Engle and Granger approach is suitable. Engle and Granger (1987) provided the following definition of cointegration:

The components of the vector  $X_t = (x_{1t}, x_{2t}, \dots, x_{nt})$  are said to be integrated of order  $d, b$ , denoted by  $X_t \sim CI(d, b)$  if

- a) all components are integrated of order  $d$ .  $X \sim I(d)$
- (b) there exists a vector  $\beta = (\beta_1, \beta_2, \beta_3, \dots, \beta_n)$  such that the linear combination  $\beta = (\beta_1 x_{1t} + \beta_2 x_{2t} + \beta_3 x_{3t} + \dots + \beta_n)$  is integrated of order  $(d-b)$  where  $b > 0$ . The vector  $\beta$  is called the cointegrating vector.

There are several important points in this definition. Firstly, cointegration refers to a linear combination of nonstationary variables. Secondly, all variables must be integrated of the same order. However, this is only true for a two-variable case, if these two variables are integrated at different orders of integration, then these two series cannot possibly be cointegrated. However, it is possible to have a mixture of different order series when there are three or more series under construction in which various subsets may be cointegrated. Thirdly, if  $X_t$  has  $n$  components, there may be as many as  $n-1$  linearly independent cointegrating vectors. If  $X_t$  contains only two variables, there can be at most only one independent cointegrating vector.

Series that are cointegrated are related over time. Any non-stationary series that are cointegrated may diverge in the short run, but they must be linked together in the long run. Therefore, cointegration implies that there must be Granger causality in at least one direction – at least one of the variables may be used to forecast the other. Furthermore, it has been proved by Granger (1981) and Engle and Granger (1987) that if a set of series is cointegrated, there always exists a generating mechanism called *error correction model* that

restricts the long-run behaviour of the endogenous variables to converge to their cointegrating relationship while allowing a wide range of short-run dynamics. Therefore, the cointegrated variables can be thought of as being generated by an error-correction model which can be used to measure the short and long-run relationship connecting two or more variables.

### **Empirical Review: Stock Markets and the Global Financial Crisis**

In examining the impact of the 2008 financial crisis on developing countries, Dirk (2008) argued that the crisis affected private capital flows (Foreign Direct Investment), portfolio flows and international lending, official development assistance and remittances to developing countries. Trade openness was identified as the major channel through which developing countries contracted the crisis. Openness to trade made countries more vulnerable to downturns but also to upturns. Furthermore, that openness to financial markets increases the risk of financial contagion; at the same time, it could increase productivity and innovation in the long term.

The AU and ECA (2009) in their report noted that the global financial and economic crisis exposed the weaknesses in the functioning of the global economy and had led to calls for reforming the international financial architecture. On stock markets, the report noted that the crisis increased stock market volatility and also led to wealth loss in major stock exchanges in Africa. In the same vein, Ackah et al (2009) argued that spikes in global food and crude oil prices in the 2007-08 period also aggravated the impact of the global financial crisis and increased current account deficits in developing countries such as Ghana.

Using descriptive data from 2007-09, Ariyo and Fawowe (2009) analysed the implications of the global financial crisis on policy response measures. They argued that the transmission channels of the financial crisis to the Nigerian economy were through capital flows, trade and financial markets' channels, while fiscal and monetary policy were deduced to have the potential of cushioning the impact of the crisis on the Nigerian economy.

A general gap observed from the literature is that they examine the impact of the crisis on developing countries and concentrate on identifying the transmission channel, impact dimension and what should be done to cushion the impact of the crisis. By so doing, the trade link or exposure that developing countries have with developed countries went unquestioned. Considering how the degree of exposure of developing countries would vary if they were not integrated with developed economies and knowing what the degree of exposure would be if the integration were different, would provide useful insight for policy on financial markets and globalization in Africa.

## Research Methodology

To achieve the objective of this chapter, stock market data were collected from August 2007 to April 2009. The data are stock price data collected for the stock market exchanges of Nigeria, Tunisia, Egypt and South Africa. Data was also collected for the United States and the United Kingdom for the West and Japan for Asia. The choice of these stock markets was informed by the works of Magnusson and Wydick (2004) and Marashdeh (2005). Their study listed Tunisia, Nigeria, South Africa and Egypt as some of Africa's biggest exchanges. On the other hand, the choice of the US and the UK was due to their linkage with the global financial crisis while Japan was chosen due to the size of its stock market in ASEAN + 3.

To estimate the degree of susceptibility of African stock exchanges vis à vis the US/UK or with Asia (proxied by Japan), the error correction model was used to measure the short and long-run cointegrating relationship. The size of their adjusted R-square represents the size of the extent of susceptibility. The model is presented below.

$$\Delta NSE_t = a_0 + \Delta a_1 USUK_t + a_2 \Delta RES1_{t-1} + U_{t1} \quad (3.1.1)$$

$$\Delta CASE_t = b_0 + \Delta b_1 USUK_t + b_2 \Delta RES2_{t-1} + U_{t2} \quad (3.2.1)$$

$$\Delta TUN_t = c_0 + \Delta c_1 USUK_t + c_2 \Delta RES3_{t-1} + U_{t3} \quad (3.3.1)$$

$$\Delta JSE_t = d_0 + \Delta d_1 USUK_t + d_2 \Delta RES4_{t-1} + U_{t4} \quad (3.4.1)$$

Where NSE is the Nigerian stock market, TUN is the Tunisian bourse, JSE is the South African Johannesburg stock exchange, CASE is the Cairo and Alexandria stock exchange (now referred to as the EGX index), and NIKKEI represents the Japanese stock market. The US/UK markets are used as the independent variable because of the link other stock markets have with them. The coefficients  $\Delta a_1 US/UK$ , ...,  $\Delta d_1 US/UK$  in the equations measure the short-run relationship connecting the markets, while  $\Delta a_2 RES1_{t-1}$ , ...,  $\Delta d_2 RES4_{t-1}$ , measure their long-run cointegrating relationship and has a negative *a priori* expectation sign. The estimated adjusted R-square from the model is used to measure the rate of susceptibility of African stock markets with the US/UK during the global financial crisis.

The Japanese stock market (NIKKEI) is then substituted with the US/UK stock markets to ascertain the extent of susceptibility African stock markets have if integrated with Asia. The *a priori* expectation is that the measure of exposure would be lower for Africa when integrated with Asia than with the US/UK. The model is specified as below:

$$\Delta NSE_t = a_0 + \Delta a_1 NIKKEI_t + a_2 \Delta RES11_{t-1} + U_{t1} \quad (3.1.2)$$

$$\Delta CASE_t = b_0 + \Delta b_1 NIKKEI_t + b_2 \Delta RES22_{t-1} + U_{t2} \quad (3.2.2)$$

$$\Delta TUN_t = c_0 + \Delta c_1 NIKKEI_t + c_2 \Delta RES33_{t-1} + U_{t3} \quad (3.3.3)$$

$$\Delta JSE_t = d_0 + \Delta d_1 NIKKEI_t + d_2 \Delta RES44_{t-1} + U_{t4} \quad (3.4.4)$$

Where NSE is the Nigerian stock market, CASE is the Cairo and Alexandria stock exchange (now referred to as the EGX index), TUN is the Tunisian bourse, JSE is the South African Johannesburg stock exchange, and NIKKEI represents the Japanese/Asia stock market. The coefficients  $\Delta a_1 NIKKEI_{t-1}$ ,  $\Delta d_1 NIKKEI_{t-1}$  in the equations measure the short-run relationship connecting the markets, while  $\Delta a_2 RES11_{t-1}$ , ...,  $\Delta d_2 RES44_{t-4}$ , measure the long-run cointegrating relationships and, likewise, has a negative *a priori* expectation sign. The estimated adjusted R-square from the model is as well used to measure the extent of susceptibility that African stock markets had with Asia during the 2007-09 global financial crisis.

A historic approach was adopted to reflect on how stock markets aid the spread of financial crisis and lessons deduced for the global South from China's experience during the 2008 global financial crisis.

## Results and Discussions

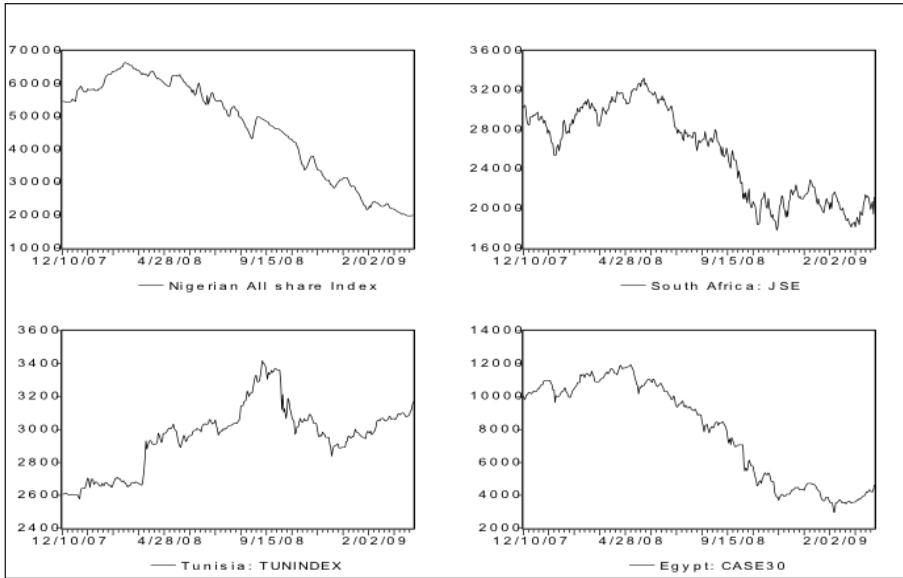
The time series data collected for the study were tested for stationarity and were all found to be non-stationary at levels, which is a requirement for estimating the two-step error correction model. The respective line graphs of the stock markets are presented in Figures 5.1 and 5.2. The trend shows that, all the African stock markets (except for Tunisia), as well as those of the US, UK and Japan, witnessed a downward trend within the study period.

Using Eviews econometric software, equations 3.1.1 to 3.4.4 are estimated and summarized in Table 5.1. The detailed Eviews output are presented in Annex 1. Below is a summary table showing their major finding.

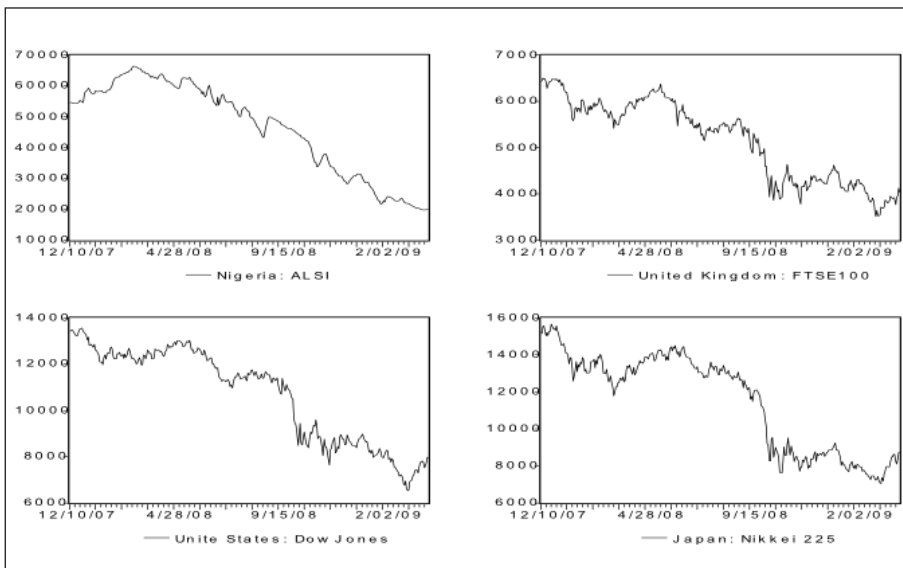
For equation 3.1.1, the short-run relationship between the Nigerian stock exchange (NSE) and the US/UK stock market is positive but not significant. This implies that positive movement in the US/UK stock market could have a positive influence on the NSE while a negative movement in the US/UK was also likely to drag the NSE downwards. But this reaction is not likely to hold for all cases since the relationship is not statistically significant. In the long run, however, shocks from the US/UK will spill into the NSE with a susceptibility level of 1.6 per cent.



**Figure 5.1:** Nigerian All Share Index, South Africa, Tunisia and Egypt: closing Stock Price Index-10 December 2007 to 3 April 2009



**Figure 5.2:** Nigerian All Share Index, FTSE 100, DOW JONES and NIKKE 1225: Closing Stock Price Index: 10 December 2007 to 3 April 2009



For equation 3.2.1, the short-run relationship between the Egyptian bourse (EGX) and the US/UK is positive and significant. This implies that positive adjustment in the US/UK stock market would affect the EGX positively, and negative adjustment, negatively. In this case, the reaction is likely to hold since the relationship is statistically significant. The long-run coefficient was also significant. This implies that shocks (positive or negative) from the US/UK will spill into the EGX with a susceptibility level of 8.7 per cent.

For equation 3.3.1, the short-run relationship between the Tunisian stock exchange (TUN) and the US/UK stock market is positive and significant implying that positive movements in the US/UK stock market would affect the TUN positively and negative movement, negatively. The degree of susceptibility of the TUN to such shocks would be 3.5 per cent and was likely to occur in the short run. Hence, the TUN would correct itself quickly restricting the impact of the shock on the short run only since the long-run relationship between the TUN and the US/UK stock market is not significant.

Estimated equation 3.4.1 shows that the South African stock exchange (JSE) has a significant and positive short-run relationship with the US/UK which is also sustained in the long run. The implication is that short-run shocks from the US/UK affecting the JSE are sustained in the long run and the JSE was found to be susceptible to the US/UK stock markets by 33.1 per cent.

In summary, Nigeria is the least integrated stock market to the US/UK. Therefore, the poor performance of its stock market within the period can rather be attributable to domestic factors than to shocks that emanated from the 2008 global financial crisis. South Africa on the other hand was the most susceptible.

Comparing Part (A) of Table 5.1 to Part (B) of it reveals something interesting for African stock markets in relation to those in the US/UK and Asia (using Japan as a case study). Though equation 3.1.2 for Nigeria is not significant, it suggests that Nigeria's susceptibility to global financial shocks is lower when integrated with Japan (at 0.4 per cent) than when integrated with the US/UK (at 1.6 per cent). For Egypt, however, the susceptibility rate is higher with Japan than with the US/UK, implying that further integration of Egypt's stock market would be more beneficial with the US/UK than with Asia (Japan). The same is the case for the Tunisian stock exchange in estimated equation 3.3.3. Its susceptibility rate is lower with the US/UK than when linked with Japan. The Tunisian stock exchange did not have a significant long-run relationship with either the US/UK or Japan. This explains why the market seemed to maintain an upward surge within the crisis period. For South Africa, however, its susceptibility rate is lower when integrated with Japan (18.3 per cent) than with the US/UK (33.1 per cent).

**Table 5.1:** Summary of error Correction Model for African Stock Markets with the US/UK and Japan

<b>(A)</b> Estimated Error correction models for African stock markets with the US/UK						
S/N	Estimated Equations	African Stock Markets	Short-run relationship with the US/UK	Long-run cointegrating relationship with US/UK	Susceptible to Contagion from the US/UK Markets	Model Significance (f-statistic)
1	(3.1.1)	Nigeria	(+) but N.S	Significant at 5% level	1.6%	Yes
2	(3.2.1)	Egypt	(+) and Significant	Significant at 5%	8.7%	Yes
3	(3.3.1)	Tunisia	(+) and Significant	N.S	3.5%	Yes
4	(3.4.1)	S/Africa	(+) and Significant	Significant at 5%	33.1%	Yes
<b>(B)</b> Estimated Error Correction Models for African Stock Markets with Japan						
S/N	Estimated Equations	African Stock Markets	Short-run relationship with Japan	Long-run cointegrating relationship Japan	Susceptible to Contagion from Japan Markets	Model Significance (f-statistic)
1	(3.1.2)	Nigeria	(-) but N.S	Significant at 10% level	0.4%	No
2	(3.2.2)	Egypt	(+) and Significant	N.S	11.9%	Yes
3	(3.3.3)	Tunisia	(+) and Significant	N.S	6.4%	Yes
4	(3.4.4)	S/Africa	(+) and Significant	Significant at 10% level	18.3%	Yes

*Source:* researcher's estimation

*Note:* N:S = Not significant statistically, (+) means positive, (-) implies negative.

The analysis so establishes that African stock markets were interlinked with those of the US/UK and, hence, were susceptible (though at varying degrees) to the impact of the global financial crisis. As will be discussed in the next section, it would however seem that there is no straight answer to whether integration with the global South would be more beneficial for Africa than with countries of the global North. The evidence is clearly country-specific and what is good for the goose may not be good for the gander.

### **Reflections on Countries of the Global South and Lessons from the Financial Crisis**

Countries of the South are emerging economies. Coined in 1981 by Antoine W. Van Agtmael of the World Bank, an emerging market economy (EME) refers to an economy with low-to-middle per capita income (Kehl 2007). Countries in this category are considered emerging because of their commitment to development by implementing a wide range of reforms. Therefore, small economies (like Nigeria) and big ones (like China) can be labelled as emerging. EMEs are characterized as transitionally moving from a closed economy to an open market economy while building accountability within the system. Embarking on an economic reform programme to achieve higher economic performance is also a characteristic of emerging economies. Other characteristics include reforms to attract foreign investors and to reduce the desire for local investors to engage in capital flight, as well as to increase local and foreign investment (portfolio and direct) in general. Investment growth in an emerging country signals injection of foreign currency into direct and portfolio investment sectors of the local economy. For foreign investors therefore, an EME serves as an outlet for new sources of revenue. If the reform measures for such countries are not tightened, this would lead to capital flight and profit plough-backs. When these investors withdraw their funds in times of uncertainty in the international market, it leads to financial and economic crisis for the local economy. Although it is argued that emerging countries would benefit in the long run from liberalization policies as openness is likely to increase production, raise GDP and help emerging countries catch up with the economies of developed countries, it is also argued that market liberalization serves as an avenue for developed countries to exploit resources from emerging economies.

For instance, before 1985, the operation of the Nigerian stock exchange, founded in 1960 as the Lagos stock exchange, was weak. Its operation improved in 1977 within the major commercial cities of the country and, subsequently, strengthened with the implementation of the Structural Adjustment Programme (SAP) in 1986. During this period, the value of the Nigerian naira in relation to the dollar had depreciated significantly. By 1985,

the Nigerian naira exchanged for a US dollar at 0.8938. By 1986, however, it exchanged by 2.0206. With the intent of addressing demand and supply constraints, currency devaluation policies have been implemented at different times in Nigeria. By 1999, the naira exchanged for 92.6934 to the US dollar. By 2008, the naira exchanged for the US dollar at 118.5669 and for 148.9017 by 2009 and around 155 naira by 2012. Despite several reforms to revamp the Nigerian stock market since the 2008 global financial crisis, its index has remained lower than the pre-2008 level. By March 2008, the Nigerian stock exchange index stood at 63,016.56 points and declined by almost 70 per cent by March 2009 to 19,803.60 points. Four years on, in May 2013, the Nigerian stock exchange is yet to attain its pre-2008 level as its index averaged 36,326.75 points in May 2013.

Based on the assessment conducted by the Ministerial Conference on Financial Crisis in 2008, Nigeria's financial sector had been in receipt of US\$ 15.73 billion in portfolio flows as at 2007 (see Oteh 2010 and Sanusi 2011). With the 2008 global financial crisis, however, foreign investors withdrew holdings from the capital market in Nigeria. The withdrawals of portfolio holdings increased the volatility of stock prices across the Nigerian stock market. While some analysts have argued that sharp practices within domestic stock markets also contributed to steepening the depth of the impact of the financial crisis in Nigeria, the capitalist nature of stock markets which makes them vulnerable to exploitation by private interests, was the root cause of the 2008 global financial crisis, as has been the case since 1929. Hence, while this section argues that certain patterns of integration could offer lesser susceptibility for African stock exchanges, the solution itself can be considered as part of short-term measures to find less vulnerable paths to pursue. For sustainability and long-term focus, however, the debate transcends what patterns of integration offer lesser susceptibility to how to reconstruct the financial architecture of countries of the global South to focus on production, industry and real sector development.

To countries of the global South, the unclear impact of the global financial crisis on China offers some lessons to be learnt. While China faces its own unique challenges like all countries of the world, understanding the impact of the 2008 global financial crisis on China provides its own unique set of lessons for countries of the global South. China's economy is heavily dependent on international trade and investment flows. In 2007, China overtook the United States to become the world's second largest merchandise exporter after the European Union (EU). China's net exports contributed to one-third of its GDP growth in 2007 as its exports of goods and services (as a share of GDP) rose from 9.1 per cent in 1985 to 37.8 per cent in 2008 (Morrison 2009). The Chinese government estimates that the foreign trade sector employs more than

80 million people, of whom 28 million work in foreign-invested enterprises. Foreign direct investment (FDI) flows to China have been a major factor behind its productivity gains and rapid economic growth. FDI flows to China in 2007 totaled US\$ 75 billion, making it the largest FDI recipient among emerging economies and the third largest overall, after the EU and the United States. Therefore, the transmission mechanism of the 2008 global financial crisis on China should ordinarily be through its export sector and industries that depended on FDI flows. However, China's exposure to the 2008 global financial crisis was curtailed, depending on how one looks at it.

On the one hand, China places numerous restrictions on capital flows, particularly outflows, so that it can maintain its managed float currency policy. These restrictions limited the ability of Chinese citizens and many firms to invest their savings overseas, but rather, compelled them to invest their savings domestically (such as in banks, the stock markets, real estate, and business ventures). Thus, the exposure of Chinese private sector firms and individual Chinese investors to the sub-prime US mortgages was small. On the other hand, if China held troubled sub-prime mortgage-backed securities, they would likely have been included in the corporate securities category which would have been invested in real estate. Yet, these holdings in China were a relatively a small share of China's total US security holdings and hence would have constituted a lesser risk (Morrison 2009). Thus, while the debate remains as to the extent to which China was affected by the 2008 global financial crisis, the strengthening of its economy around domestic investment and production made it less vulnerable to the crisis. While China was to a lesser extent exposed to the financial crisis, this was not the case for most countries of the global South. These were largely exposed to the vagaries of the crisis due to their high openness to the economies of the US and UK in direct and portfolio trade, and because their economies were largely monolithic and characterized by weak domestic investment and a low industrial base.

## Summary and Conclusion

The impact of the 2007-09 global financial crises had consequences for African countries. But would the consequence be any less if the integration of African stock markets were tilted towards countries of the global South? The evidence provided in this paper suggests that some African countries would be better off integrated with the global South while others would be better off furthering their integration with the global North. Countries that would integrate both ways, however, would be likely to reduce susceptibility from external shocks. For instance, comparing the benefits on integrating with the West (the global North) or with the global South, it was found that the (South) African stock exchange (at 33.1 per cent) was more susceptible to external

shock from the US/UK while the Nigerian stock market (at 1.6 per cent) was the least susceptible. When integrated with Japan, it was found that South Africa's susceptibility reduced from 33.1 to 18.3 per cent but increased from 0.4 to 1.6 per cent for Nigeria. This finding implies that further integration of Nigeria with Asia would not be as beneficial as it would for South Africa. It also means that, while the decline witnessed in the South African stock exchange can be attributed to the global financial crisis, domestic factors, rather than the global financial crisis, were responsible for the decline in the performance of the Nigerian stock exchange. For Tunisia and Egypt, however, the extent of susceptibility to shocks was lower with the US/UK (at 3.5 and 8.7 per cent respectively) compared to when integrated with Asia (at 6.4 and 11.9 per cent respectively). Similarly, the deduction from this is that though the integration with the global North might have contributed to the negative spread of the global financial crisis to some countries in the global South (e.g. Nigeria and South Africa), it brought about some benefits to others in the global South as well (e.g. Egypt). Hence, the benefit for Egypt's integration with the global South could be explored while the direction of benefit for Tunisia is not clear.

In conclusion, while this chapter argues that a certain pattern of integration could offer lesser susceptibility for African stock exchanges, this solution itself can be considered as part of broader short-term policy measures to addressing vulnerability due to stock market integration. For sustainability and long-term policy measures, however, the debate would ordinarily transcend what pattern of integration offers lesser susceptibility and concern itself with reconstructing the financial architecture of countries of the global South by focusing on production, industry and real sector development.

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**Annexes: Estimated Results for Equations 3.1.1 to 3.4.1, and 3.1.2 to 3.4.4****Table 5.2:** Error correction model of the Nigerian stock exchange with the US/UK

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Dependent Variable: D(NSE)  
Method: Least Squares  
Sample (adjusted): 12/11/2007 3/04/2009  
Included observations: 322 after adjusting endpoints

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-96.21703	34.12462	-2.819578	0.0051
D(USUK)	0.332820	0.248962	1.336831	0.1822
RES1(-1)	-0.015864	0.006489	-2.444836	0.0150
R-squared	0.021885	Mean dependent var		-101.0146
Adjusted R-squared	0.015752	S.D. dependent var		613.8324
S.E. of regression	608.9785	Akaike info criterion		15.67072
Sum squared resid	1.18E+08	Schwarz criterion		15.70588
Log likelihood	-2519.985	F-statistic		3.568740
Durbin-Watson stat	1.213671	Prob(F-statistic)		0.029322

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*Source:* Eviews Output, researcher's estimation

**Table 5.3:** Error Correction Model for Egyptian Stock Exchange with the US/UK

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Dependent Variable: D(CASE)  
Method: Least Squares  
Sample (adjusted): 12/11/2007 3/04/2009  
Included observations: 322 after adjusting endpoints

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.34515	9.292807	-1.651293	0.0997

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D(USUK)	0.340666	0.067867	5.019578	0.0000
RES4(-1)	-0.038220	0.011575	-3.302028	0.0011
R-squared	0.092860	Mean dependent var		-20.09745
Adjusted R-squared	0.087173	S.D. dependent var		173.5812
S.E. of regression	165.8430	Akaike info criterion		13.06923
Sum squared resid	8773742.	Schwarz criterion		13.10440
Log likelihood	-2101.147	F-statistic		16.32731
Durbin-Watson stat	1.875695	Prob(F-statistic)		0.000000

*Source:* Eviews Output, Researcher's Estimation

**Table 5.4:** Error correction model of Tunisian stock exchange with the US/UK

Dependent Variable: D(TUN)

Method: Least Squares

Sample (adjusted): 12/11/2007 3/04/2009

Included observations: 322 after adjusting endpoints

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	1.895653	1.332923	1.422177	0.1560
D(USUK)	0.033629	0.009707	3.464435	0.0006
RES2(-1)	-0.006543	0.007178	-0.911480	0.3627
R-squared	0.040643	Mean dependent var		1.412019
Adjusted R-squared	0.034628	S.D. dependent var		24.21061
S.E. of regression	23.78774	Akaike info criterion		9.185490
Sum squared resid	180508.2	Schwarz criterion		9.220657
Log likelihood	-1475.864	F-statistic		6.757172
Durbin-Watson stat	1.870330	Prob(F-statistic)		0.001336

*Source:* Eviews Output, researcher's estimation

**Table 5.5:** Error correction model of South African stock exchange with US/UK

Dependent Variable: D(JSE)

Method: Least Squares

Sample (adjusted): 12/11/2007 3/04/2009

Included observations: 322 after adjusting endpoints

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	-6.053208	23.51797	-0.257387	0.7970
D(USUK)	2.127111	0.170642	12.46533	0.0000
RES3(-1)	-0.043490	0.015828	-2.747565	0.0063
R-squared	0.335551	Mean dependent var		-36.43882
Adjusted R-squared	0.331385	S.D. dependent var		513.3046
S.E. of regression	419.7235	Akaike info criterion		14.92634
Sum squared resid	56197534	Schwarz criterion		14.96151
Log likelihood	-2400.141	F-statistic		80.54835
Durbin-Watson stat	2.153188	Prob(F-statistic)		0.000000

*Source:* Eviews Output, researcher's estimation

**Table 5.6:** Error correction model of the Nigerian stock exchange with Japan

Dependent Variable: D(NSE)

Method: Least Squares

Sample (adjusted): 12/11/2007 3/04/2009

Included observations: 322 after adjusting endpoints

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	-101.8623	34.27122	-2.972239	0.0032
D(NIKKEI)	-0.040701	0.128695	-0.316256	0.7520
RES11(-1)	-0.010129	0.005532	-1.831156	0.0680
R-squared	0.011158	Mean dependent var		-101.0146
Adjusted R-squared	0.004958	S.D. dependent var		613.8324

S.E. of regression	612.3087	Akaike info criterion	15.68162
Sum squared resid	1.20E+08	Schwarz criterion	15.71679
Log likelihood	-2521.741	F-statistic	1.799787
Durbin-Watson stat	1.235813	Prob(F-statistic)	0.167009

*Source:* Eviews Output, Researcher's Estimation

**Table 5.7:** Error Correction model of Egyptian stock exchange with Japan

Dependent Variable: D(CASE)

Method: Least Squares

Sample(adjusted): 12/11/2007 3/04/2009

Included observations: 322 after adjusting endpoints

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	-14.35707	9.117680	-1.574641	0.1163
D(NIKKEI)	0.232672	0.034497	6.744641	0.0000
RES44(-1)	-0.010015	0.009239	-1.084025	0.2792
R-squared	0.124808	Mean dependent var		-20.09745
Adjusted R-squared	0.119321	S.D. dependent var		173.5812
S.E. of regression	162.8965	Akaike info criterion		13.03338
Sum squared resid	8464748.	Schwarz criterion		13.06855
Log likelihood	-2095.374	F-statistic		22.74564
Durbin-Watson stat	1.853469	Prob(F-statistic)		0.000000

*Source:* Eviews Output, researcher's estimation

**Table 5.8:** Error Correction model of the Tunisian stock exchange with Japan

Dependent Variable: D(TUN)

Method: Least Squares

Sample (adjusted): 12/11/2007 3/04/2009

Included observations: 322 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.979744	1.311287	1.509772	0.1321
D(NIKKEI)	0.022983	0.004917	4.674171	0.0000
RES22(-1)	-0.006885	0.006843	-1.006251	0.3151
R-squared	0.069352	Mean dependent var		1.412019
Adjusted R-squared	0.063517	S.D. dependent var		24.21061
S.E. of regression	23.42910	Akaike info criterion		9.155108
Sum squared resid	175106.4	Schwarz criterion		9.190275
Log likelihood	-1470.972	F-statistic		11.88599
Durbin-Watson stat	1.884122	Prob(F-statistic)		0.000011

*Source:* Eviews Output, researcher's estimation**Table 5.9:** Error correction model of South African stock exchange with Japan

Dependent Variable: D(JSE)

Method: Least Squares

Sample (adjusted): 12/11/2007 3/04/2009

Included observations: 322 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.49737	25.97354	-0.596660	0.5512
D(NIKKEI)	0.846608	0.098580	8.588007	0.0000
RES33(-1)	-0.027543	0.015934	-1.728538	0.0849
R-squared	0.187899	Mean dependent var		-36.43882

Adjusted R-squared	0.182807	S.D. dependent var	513.3046
S.E. of regression	464.0207	Akaike info criterion	15.12701
Sum squared resid	68685553	Schwarz criterion	15.16218
Log likelihood	-2432.448	F-statistic	36.90412
Durbin-Watson stat	2.079122	Prob(F-statistic)	0.000000

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*Source:* Eviews Output, researcher's estimation