Market Risk Instruments and Portfolio Inflows in African Frontier Economies

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Abstract Financial investments enable portfolio investors to earn above market returns which do not come without risks. The African frontier markets (FMs) are investigated here and this chapter brings into focus the determinants of portfolio flows into these markets. The number of FEs in African investigated is six and two key financial instruments are used as returns: stock market returns and interest rate spread. Other variables used in the study include reserve liquidity, exchange rates and national income. The method of estimation adopted is the Vector autoregression with Granger causality. The results show that the all the variables are significant with the portfolio inflows. Specifically, portfolio funds are income chasing; the liquidity of reserves is also significant for every country among the FEs to enjoy inflows of portfolio funds, impacting on the exchange rates. Stock market returns is also highly significant in the Granger causality tests. Recommendations made include the increase in productivity to increase income and exports in these economies. In addition, African FEs must reduce interest rate margins to increase real production and encourage bonds markets development and thus attract portfolio investment into the sector rather than to concentrate all attention on the equities market.

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1 Introduction

The investment world is looking out constantly for avenues to earn more and above average returns which by finance dictum must come with a higher level of risks. The level of risk is an indicator of the level of potential returns possible. The returns are not earned except with some informed knowledge and arduous task of measuring the eventual safety of the investments. Many investors engage research to bring about estimated supernormal returns that would ordinarily not be possible. The Efficient Market Hypothesis (EMH) proves that the strong form of the market indicates either an insider or deep informed knowledge is required to be profitable. Domestic investment in financial assets in mature and advanced market is surfeit and returns are entirely predictable. In addition, markets though maintaining a general trait in microstructure nevertheless differ in infrastructure and domestic practises which ultimately impacts on the performance and thus possible return that can be garnered in the market. Thus many efforts have been directed at emerging markets in order to maximise investments and returns without much attention paid to the frontier markets. A number of foreign investors have taken more than casual interest in these markets with the ultimate aim of making profitable commitments.

This is not without attendant risks in such markets. Apart from some studies on portfolio investment, many concentrate on Foreign Direct Investment, which though important is not the only form of investment in these countries that can be profitable. Frontier market by their nature have proved to be veritable outlet of funds from mature financial markets just like the emerging markets and therefore deserves to be empirically investigated.

Capital Market consultative Group (2003), a document from the IMF details so much information about Foreign Direct Investments in emerging market economies (EMEs) around the world with scanty information on Africa (all information mostly from South Africa). But the foreign inflows are often hot in nature. Investments in the financial system is being blamed for the exchange rate crisis and volatilities in stock markets. As a result of the flows of portfolio investment reaching a peak in the EME countries, attention is being shifted gradually to the frontier economies (FEs) for exploitation by portfolio institutions from mature and advanced markets. As a result of this, a number of countries in Africa become targets, where even countries like Argentina (with unstable currency), Bangladesh (with political instability) and in Africa, Kenya (politically unstable) and Nigeria (highly risky) have been in the spotlight for portfolio investment. The Morgan Stanley Capital International (MSCI) has been at the forefront of providing reliable and useful information on the EMEs and the FMs. Thus it has data that can be of help on many of the investments environments. For the African economies, investment scenarios need more attention from the developed markets for them take advantage. However, the environments of these countries make the investments to be profitable by the level of liquidity available. Nielsen (2012) thoroughly examined the portfolio investment situation in African financial markets and found that there are a number of countries where investment has been less than the economy could absorb.

Since ratings is available on some of the countries, it has become possible to put these countries in classes given the level of country or sovereign risks they face, since each of these can seriously vitiate the expected return of investments. The national risk is conceptualised in the infrastructure and institutional developments as far as country risks which seem to be main challenge to grapple with is concerned. FEs that is on focus on the African continent in this paper is as defined by the MSCI, as a number of other definitions are possible with other indices. These countries are mainly: Botswana, Kenya, Mauritius, Nigeria and Tunisia. The paper is deliberate in replacing Morocco as contained in the list of MSCI with Botswana for obvious reasons. Firstly, it is the most stable market of the Southern African countries and therefore represents the region in this paper. The inclusion of Morocco would have been counting a second MENA country after Tunisia. Secondly, the choice of Botswana provides the balance of regions that the chapter seeks to achieve.

Many analysts studying the investment situation in Africa focus on so many primordial issues that may vitiate the investments of portfolio funds and therefore offer pieces of advice, though ingratuitously. Such risks as political, market and liquidity risks are of importance for concern as these may cause unexpected losses. Political risk is seen as possibility of civil unrest occasioned by election, coups and the rest and the possibility of the risk of secession among constituent sub-nations. Liquidity risk is the risk from inability of the market to absorb the assets of investment. This is a major reason why Hedge Funds (HFs) do not go for real estate. Market risk is the risk of losses that the economy imposes which cannot often be diversified away. Market risk is a composite of some other risks that may make the investment unprofitable eventually. Investors do in-depth analysis before committing to undertake investments in most of these countries.

Market investments generating risks are mainly currency, interest rate, equities and commodities that are available in the economies of the African countries. Since the interest of the portfolio funds investors are in the economy that best maximises their returns, portfolio funds are choosy as to what countries they commit to. The instability of each these investments mean unpredictability in the possible outcomes for the investments in these economies. This is what makes portfolio flows to be as unpredictable and uncertain in the nature of the investment flows into these economies. The countries involved are variously defined with common characteristics as small open economies allowing foreign inflows and outflows and can absorb an amount of investment. Thus the sample of African frontier countries adopted for this study is picked in manner explained in the methodology.

The main objective of this chapter is to discuss the major risks of financial market investments and portfolio investments inflows into FEs in selected African countries and empirically discover the main attraction of the investors. The paper is organised as follows: Following after the introduction is the literature review on major types of financial investments and risks attaching to them. Section 3 is on the models and techniques of estimation while Section 4 discusses the results and the last section concludes and recommends for the chapter.

2 Literature Review

Following closely to the emerging markets of the world among which the BRICS are noted is the Frontier Economies (FEs) that are described as small open economies that are likely to record growth in the near future given stable development but currently less stable than emerging market economies (EMEs). The FEs also shares the main qualities of the EMs though to a reduced degree as far as governance is concerned. Insufficient information and *in* stability seem to be the basic criteria of these countries that marked them out for the qualification they are given. Thus much less is available on them from the academic world. Nellor (2008) gives three basic qualifications for these economies to be either classified as EMs or FEs. They are: there must be take-off in growth, such growth must be private sector driven and backed by the public policy, and availability of an active financial market to invest in.

Burgess and Mühlberger (2011) identify eight countries that record strong growth and thus qualified to be named among the FEs in Africa. The countries are Angola, Ghana, Kenya, Nigeria, Senegal, Tanzania, Uganda, and Zambia, though other countries such as Ethiopia are excluded where basic criterion is strong growth based on one factor or component of market risks or the other. Notable organisations that attempt to identify these countries are FTSE, Dow Jones, MSCI and Russell. While total number of countries globally amounts to 39, 10 of these countries are in Africa. Most countries in the FE class have undergone some financial liberalisation of their markets thus paving way for inflows private capital.

Since private investors are ready to invest when the risk appetites are right but the issue of premium constitute the main considerations in the investors' choice. Nature presents the male folks as being more risk loving than females (Powell and Ansic 1997) which does not inviolate their (the female folks) acumen in business strategies and ability to perform. This can be transmuted to the leadership of HFs. Risk analysis is a highly quantitative procedure that spans calculus, probability and algebra to perform complex calculations that have been simplified by the use of software by Asset Managers (AMs). Alexander (2008) contains many procedures that engage the use of the above techniques and many others. The practise is to adopt the use of software and other spreadsheet based analysis that is market-specific and tailored to meet specific needs. One very important requirement is the knowledge of what risk the software is built to overcome. With the level of development knowledge, uncertainty which is initially believed to be immeasurable can now be measured (Menezes et al. 2013). Value at Risk has been the traditional measure of risk and all other developments are now centred on it but Krokhmal et al. (2002) introduces Conditional Value-at-Risk. Beck's (Beck and Feyen 2013) analysis of gaps and political risk is highly significant in most economies while financial and economic risks feature significantly in the gap analysis.

Political risk is any event that can directly or indirectly alter the value of an economic asset (Glancy 2015) and country risk analysis and observations in literature is dominated by AMs and investor's advisors. For instance, an advertorial indicates Botswana and Tunisia as having higher level of transparency than most

Asian and Latin America countries (Cushman Wakefield, 2014). A major risk indicated for Nigeria is political, insurgency and break-up. Forward Thinking (2015) exhaustively dealt with the risks of various types especially the political risks common in the FEs around the world. While not particularly ascertaining risks common to these countries general risk remain and yet significant in the risks are political, liquidity and volatility. All these risk can be mitigated by diversification while the political risks remain. Promotion of the FEs in Africa has been strident from many of the AMs and HFs as well as the supranational bodies within the continent, for example, Economic Commission for Africa (2015). International Organization of Securities Commissions (2014) mentions the rate at which capital flows to FEs and EMs have increased such that asset under management has grown tremendously from $825 million to $2.3 trillion in over 10 years at the first quarter of 2014. The publication also notes that capital flows around the world has increased tremendously thus impacting on the capital markets in Africa. While bond market activities have increased so has crowd funding, though still a small part of the funds raised but growing at an alarming rate with the US dominating issues.

2.1 Risk and Market Instruments

Four of the risks investigated in this paper are included in Sy (2015) when the sudden rise in the interest of African countries to borrow heightened and greater international participation in international market took place. Commodities, bond investment, and interest rates suddenly made investments in African countries profitable while Africa also forayed outside to deal. Market equity risk premium indicates a relationship between risk and premium is positive and the higher the market risk the higher expected market equity premium (Maheu and McCurdy 2007). Inflation risk is common for most countries but is significant in countries with investors who invest domestically since the portfolio investors may not have a long term horizon in the market. Garcia and Werner (2010) theorises on the inflation risk premia linked (of course) to interest rate and other macroeconomic variables. Equity premium on the other hand has its roots in country risks and base premium for mature equity market plus country premium which reflect the extra risk in the specific market (Damodaran 2012). Heavy dependence on historical data is now no longer a reliable way to measure equity risk (Damodaran 2012). Highly unpredictable and volatile, the risk premium on currency and exchange rates present perplexing scenarios. Again linked to interest rate (spread) the premium is also heavily influenced by trade and supply and demand factors. For instance, currencies undergoing reforms and changes in their jurisdictions are often victims of heavy speculation. Carlson and Osler (2003) indicates the after effects of differentials lead to higher volatility in the Exchange rates (ERs), while Poghosyan (2012) show that countries who linked their currencies to others suffer the after-effects of the counterpart countries consumption and spending patterns. A recent study shows that business cycles, global risks aversion and traditional ER

fundamentals are still significant (Sarno et al. 2012). Business cycles are more influenced by trade flows between economies that are heavily dependent on commodities for foreign exchange reserves. Markets risks for holding commodities as hedge instruments are not often priced and inventories are important in both spot and future prices (Roache 2008). Commodities frequently are sensitivities to risk and investors are expected to continuously update themselves when investing in commodities as hedge instruments.

2.2 Risk Premiums on Investments

Most literature emphasises on risk free and premium on risks of the products bought and sold in the financial market place as the risk to a large extent determine the returns. The different market risks: namely have risk premiums that encourage risk loving investors to invest. For instance, the risk premium on corporate bonds differ one from another depending on the class of risk the firm; this is also replicated in the foreign exchange market, the interest rates or coupon on short term money instruments and as well as commodities. Arnott and Bernstein (2002) summarises that a complicated process to determine each of the premium on bonds and equity involves the ascertainment of expected real stock and bonds returns, bond and dividend yield and inflation. The paper concludes that the past values are unreliable to extrapolate on and assume a premium for the future for any class of assets. Therefore, the risk premiums for today are averagely less than what existed before and investors should not expect such returns as 8 and 5 % risk premiums on equity and bond stocks respectively. Duarte and Rosa (2015) believes that the current high rate of equity premium is caused by the low yield on bonds which most probably is caused by inventors' liquidity preference.

Risk premium in the foreign exchange market would be important for arbitrageurs and speculators who trade and take positions in currency markets. This would be meaningful for study when determining the depreciation level of currencies. Perhaps more dynamic than other market risks, Cheng (1993) finds that there is great degree of persistence and exchange rates premiums have high degree of co-variance and thus does not support an earlier theory of Lucas (1982). Risk premium on currency has been linked to stock market returns and that global variance risk premium has a higher predictive power on currency risks premium returns and mainly influenced by bilateral forex returns and excess equity return differentials (Aloosh 2014). In all, the risk of depreciation overtime is what investors and traders in those currencies face.

Commodities present a special case for risk premiums which is largely determined by the inventories in such commodity (Gorton et al. 2012). This is supported by the modern theory of storage which is not significantly different from Haase and Zimmermann (2013) whose study of the crude oil market show that the convenience yield that is assumed does to exist and that exchange rates and stock markets also affects the crude oil commodity sector. Interesting as this is, this chapter does

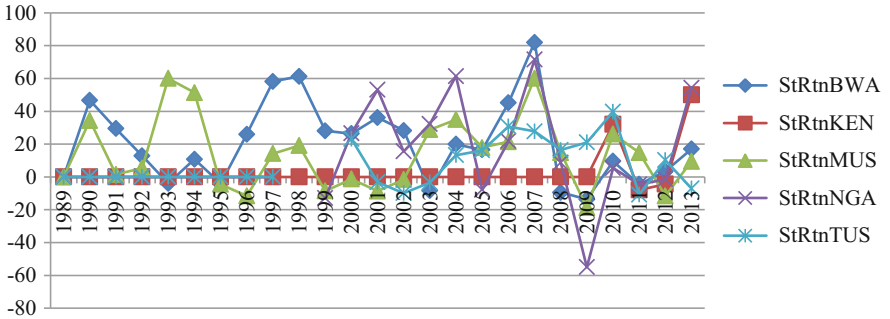

Fig. 1 The stock market returns of various FM economies in Africa. Source: Data from World Development Indicators

not look at the commodities risks in order to focus on the financial instruments that are components of market risks.

Perhaps the most important reason for the influx of HFs in African frontier markets is the uncorrelated nature between financial market returns of matured economies and emerging and frontier markets. However, can the African FMs be said to have correlated returns? Determinants of the stock market returns are many and may be country-specific. Osisanwo and Atanda (2012) opine that interest rates, liquidity, previous stock return and money supply are significant in Nigeria. The stock markets returns of the stock exchanges of the countries in this study are plotted in Fig. 1. While coordinated movements are observable there are also volatilities. Apart from the Nigerian Stock Exchange, the other stock markets are less in significance in terms of market capitalisation and traded volume of stocks.

2.3 Frontier Economies in Africa

Specifically each country has its idiosyncratic risks that mark it out among the FMs in Africa. For instance, Nigeria's stock market prices respond to interest rates changes, and Udegbunam and Oaikhenan (2012) corroborates that duration and convexity hypothesis of interest rates sensitivity to stock market prices. The study also asserts that duration and convexity exert strong opposite impacts on prices and net effect of interest rate changes on stock prices is negative, an indication that stock prices fall with increases in stock risk.

Classification of countries in the FE class appears not to be uniform. Various institutions have classified according to indexes which they have formed for own convenience. Various studies grouped such countries and a number of these countries are picked form the pool. Thus FTSE has (6) countries, MSCI (5) Standard and Poor (9) Dow Jones (4) and Russell (11) countries. Among these countries the study picks six: namely Botswana, Cote d'Ivoire (CIV), Kenya, Mauritius, Nigeria and Tunisia believed to represent a balanced spread between geography and sustained

growth over the years. Of note is Cote d'Ivoire which represents French West Africa but has little data for the study. Its stock market data is rather sketchy.

3 Methodology and Models

Market risk measurements lend themselves to many variables. Basic variables as discussed in the literature form the dependent and independent variables used in the models intend to capture the flows of portfolio funds into the FEs. The paper identifies reserve liquidity, interest rates spread, and exchange rate, for analysis in the paper. Endogenous attractions to HFs in most FEs of Africa are the rising reserve liquidity, the deregulation of the financial and foreign exchange markets. Variables representing these sectors are official exchange rates, reserve position without Gold, stock market returns and interest rates spread. Income is added as an endogenous benefit for the FM economies. The countries are abbreviated as BWA, CIV, KEN, MAU, NGA, and TUS for Botswana, Cote d'Ivoire, Kenya, Mauritius, Nigeria and Tunisia respectively.

Data sources are from the World Development Indicators (WDI) with a maximum range of 25 years to capture the last global financial crises in the case study countries from 1989–2014. The data are official exchange rates (*OEXR*), Reserve minus Gold (RG), Gross national income (*GNI*), Portfolio flows (*RPORTFL*) Interest rates spread (*INTSP*) and Stock market Returns (*STMKT*). Thus on panel basis, the data amounts to 150 observations for the six FE countries.

The study adopts Vector Autoregressions (VAR) to measure the impacts of the various data on one another. The model has been found useful in forecasting which is very important at this time of development in most FEs in Africa where emphasis has been on attraction of foreign investment. The models allow a fair impact assessment and predictability of responses. The study hypothesises that:

$$Yt = \alpha + \sum_{k-1}^{k} A_k Y_{t-k} + \sum_{1-0}^{L} B_1 X_{t-1} + e_t \tag{1}$$

Where Yt endogenous variables

- Y_t: a (nx1) endogenous variables (*stmkt*, *intsp*. . .*oexr*, *gni rg*).
- X_t: a (nx1) exogenous variable: *rportfl*.
- e_t: a (nx1) residual term.
- A_k: the matrix that measures how endogenous and exogenous variables returns react to their lags.
- B_l: the matrix that measure how *rportfl* react to the exogenous variable.

k e_t L: numbers of endogenous and exogenous observations. k and L are chosen based on the Akaike (1974) (AIC) and Schwartz (SC) information criteria. A VaR (p) model with p variables is written as follows

$$y_t = A_t y_{t-1} + A_2 y_2 + \ldots + A_p y_{t-p} + Bx_t + \varepsilon_t \quad (2)$$

Explicitly the paper generates a system of equations of VaR(p) as below

$$\begin{aligned}
rportfl_t &= oexr_t + rg_t + stmktr_t + \text{int}sp_t + gni_t \\
oexr_t &= rg_t + stmktr_t + \text{int}sp_t + gni_t + rportfl_t \\
rg_t &+ stmktr_t + \text{int}sp_t + gni_t + rportfl_t + oexr_t \\
stmktr_t &= \text{int}sp_t + gni_t + rportfl_t + oexr_t + rg_t \\
\text{int}sp_t &= gni_t + rportf;_t + oexr_t + rg_t + stmktr_t \\
gni_t &= rportfl_t + oexr_t + rg_t + stmtr_t + \text{int}sp_t
\end{aligned} \quad (3)$$

The panel estimations is done for the FEs as above and results are shown the next section. In addition, the study also adopts an individual country regression to determine the impact of the variables on each of the countries. The explicit form of the regression is as stated below:

$$RPORTFf\alpha_0 + \beta_1 GNI_{it} + \beta_2 INTSP_{it} + \beta_3 OEXR_{it} + \beta_4 RG_{it} + \beta_5 STMKTR_{it} + \varepsilon_{it} \quad (4)$$

4 Results and Discussions

The summary of the descriptives of the data in raw form is shown in the Table 1. Across the countries maximum portfolio was some $174 billion with a mean of $4.8 billion with 72 reported observations. Standard deviation for *OEXR* is 238.37 while *GNI* is $1936.3. Mean score for *RG* is $346. *STMKTR* has a higher SD than *INTSP* indicating a higher level of volatility in the stock market (Table 1).

Stationarity of the variables was undertaken on panel basis using Hadri unit root test. A stationary result was achieved after first differencing. The output is presented in the Table 2.

4.1 Vector Autoregression Results

As modelled above, the result of the VAR estimation shows that the after differencing the variables performed well in the total estimation. (The result is abridged: insignificant lags have been removed as well as all standard errors). The number of lags chosen is 4 as prescribed in lag selection criteria (this is not shown here). The dependent variable that corresponds to the most significant dependents variable with lags shows that the *RPORTF* has overall significance with the most number of lagged variables. The result shows that significant negative result in the *RPORTF* lag 4, *INTSP* lags 2, 3 and 4. Initial negative significant result is indicated by *GNI* lag 2 but positive in lag 3 and 4. Interestingly *STMKTR* is negative with its own lags

Table 1 Descriptives for the variables

	GNI	INTSP	OEXR	RG	RPORTF	STMKTR
Mean	1926.25	7.74142	196.185	3.46E+0	4834855	21.07715
Median	990	7.834221	73.82747	3.31E+09	9794350	18.45901
Maximum	7370	16.19583	733.0385	9.79E+09	1.74E+08	81.9103
Minimum	260	0.433333	2.021557	2259637	1051260	−55.0162
Std. dev.	1936.29	3.763145	238.3707	2.77E+09	60756534	26.38764
Skewness	1.401792	−0.04713	0.894905	0.49672	0.803541	0.181499
Kurtosis	3.927855	2.507688	2.129809	2.068894	1.889803	2.942285
Jarque-Bera	26.16301	0.753771	11.88195	5.561639	11.44575	0.405294
Probability	0.000002	0.685994	0.002629	0.061988	0.00327	0.816566
Sum Sq. D.	2.66E+08	1005.449	4034263	5.47E+20	2.62E+17	49437.82
Observations	72	72	72	72	72	72

Source: Output from data

Table 2 Test of stationarity (Hadri)

Null hypothesis: Stationarity				
Series: GNI, INTSP, OEXR, RG, RPORTF, STMKTR				
Method			Statistic	Prob.**
Hadri Z-stat			−2.01646	0.9781
Heteroscedastic Consistent Z-stat			−0.84256	0.8003
Intermediate results on D(UNTITLED)				
Variance				
Series	LM	HAC	Bandwidth	Obs
D(GNI)	0.0346	991847.2	5.0	142
D(INTSP)	0.0517	2.736287	7.0	91
D(OEXR)	0.0700	3426.713	4.0	143
D(RG)	0.0323	2.26E+19	7.0	143
D(RPORTF)	0.0609	2.63E+14	1.0	149
D(STMKTR)	0.0643	107.6434	11.0	104

Source: Output of the variables

through lags 1, 3 and 4. While the highest positive significant result in is indicated by *OEXR* that is beyond 0.01, but more importantly that the *OEXR* contributes more to *RPORTF* than *GNI* and *STMKTR*. The significance of the negative output shows that *STMKTR* continuously indicate negative output in lags 1, 3 and 4.

With the above result, the study undertook a Granger-causality test to examine the impacts of the variables on one another and which was sufficient enough to cause the other. Significant results of the output of the variables are stated in the Table 3. The flow or direction of causality is directly observed in the result. For the African FEs, the increase in the *GNI* has brought about the flow of *RPORTF*. The *Wald* statistic is a high 4.33 indicating the significant level is beyond 0.05. In the opposite direction of *RPORTF* does not lead to increase in *GNI* as the statistic is not significant. The *OEXR* granger-causes inflows of *RPORTF* and this is highly significant at 15.26 which is beyond 0.01. Conversely the *RPORTF* does not granger cause *OEXR*. While *RG d*oes not granger-cause *GNI*, *GNI* granger–causes

Table 3 Raw data granger causality tests

Pairwise granger causality tests			
Sample: 1 150			
Lags: 2			
Null hypothesis:	Obs	F-Statistic	Prob.
GNI does not granger cause RPORTF	141	4.33529	0.0150
RPORTF does not granger cause GNI		0.43511	0.6481
OEXR does not granger cause RPORTF	142	15.2689	1.E−06
RPORTF does not granger cause OEXR		0.08687	0.9169
RG does not granger cause GNI	141	0.02391	0.9764
GNI does not granger cause RG		2.38701	0.0957

Source: Output from raw data

RG. The positive relationship is significant only to 0.10 level. The results which generally show unidirectional flow of causality is observable and are quite significant among the few variables where they occur, utilising about 142 of 150. Thus the variables of *GNI* and *OEXR* are very important in the *RPORTF* in the FEs of Africa.

From the above the different granger-causality test results, the significant variables are *OEXR*, *GNI* and *RG*. The VAR-granger causality test result indicate that the all the variables including the *INTSP* are significant and the most significant of them is *OEXR*. This leaves the main variables of interest *INTSP* and *STMKTR* to be non-significant. The differencing of the variables indicate that the variables are in the long run significant with unidirectional causality running from the independent variables to the dependent variables. Of these, the most significant are the *OEXR* and *STMKTR* which still further indicate that the risky sectors in Africa FE does not include the bond market, but the stock market. The level of significance of the variables is beyond 0.01. While the *INTSP* is moderately significant at 0.05 levels and the least is *RG* which is beyond 0.10 levels. The *RPORTF* takes advantage of the currency rates to invest in the continent and maximise returns (Table 4).

4.2 Individual Country's Regression Outputs

Since the case study undertook an individual country regression the outputs of which are not too far from the panel results but show some countries individualistic and idiosyncratic nature in country risks. For instance, *OEXR* is positively insignificant in Nigeria, whereas it is significant in other countries especially in Kenya and Tunisia. The level of positive significance of *GNI* in all the countries is high and beyond 0.01. *INTSP* is significant in both Kenya and Tunisia. It is significant beyond 0.05 levels in Kenya and beyond 0.10 in Tunisia. The variable is negatively insignificant in Botswana and Cote d'Ivoire but positive in Nigeria and Tunisia

Table 4 VAR granger-causality test result

Excluded	df	Default Data		Differenced Data	
		Chi-sq	Prob.	Chi-sq	Prob.
Dependent variable: (RPORTF)					
STMKTR	4	37.33847	0.0000	32.63067	0.0000
RG	4	10.16752	0.0377	8.273229	0.0821
OEXR	4	152.5538	0.0000	129.7428	0.0000
INTSP	4	11.91328	0.0180	10.17572	0.0376
GNI	4	15.56921	0.0037	17.54998	0.0015
All	20	276.7056	0.0000	269.1725	0.0000
Dependent variable: D(STMKTR)					
RG	4	9.622949	0.0473	8.239769	0.0832

Source: Output from data

other countries. The variable is insignificantly positive in Nigeria and Mauritius. *RG* is positive and nearly significant in Botswana, highly significant in Cote d'Ivoire and Nigeria. The variable is negatively insignificant in Kenya, but negatively significant in Tunisia. The *STKMR* also shows various signs in the three FE countries where it features. It is positively insignificant in Botswana and Mauritius but negatively insignificant in Nigeria.

Summary statistics appear good with R^2 between 0.97 and 0.99 while Adjusted R^2 is between 0.94 and 0.98. The fit for most of the output is achieved with 23 series of data except for CIV which has 14. The *F Stat* is also very robust with a high of 373.63 for Kenya and a low of 38.47 for Mauritius. DW of the output is between 1.720 and 2.206, except for Kenya with 1.272. Observation is between 23 and 14. The complete table is shown below. Empty spaces indicate lack of data for the country. The output is shown in Table 5.

As shown in Table 5, the results indicate *GNI* is an attraction to *RPORTF* showing poor countries on their own cannot benefit from inflows of investment from overseas. This is positively significant in all the FE countries. The level of income has been one of the major attractions into the African FEs. One of the major variables for consideration is the *INTSP* which show different outputs and signs in most of the countries. The *INTSP* indicate that where positive that *RPORTF* bonds or money market instrument must important inducing *RPORTF* into these countries. This is the case of Tunisia and Nigeria. Interestingly the *OEXR* is significant tin all the countries except for Nigeria which means most of the countries have weak currencies or low values for their currencies which encourages the *RPORTF*. This is only plausible in that most the currencies depreciated all through the data series. *RG* is a reason for most *RPORTF* because the liquidity of reserves allows easy transfer of returns out of the FEs once the investors' objective is met and time horizon fulfilled. The corollary of bond investment in Tunisia is seen in the significantly negative *RG* output. Thus the three main components of market investment in Africa FEs show that currency sector is most receptive or susceptible to flows of portfolio investment as the weak nature of the currencies and rising income have been a major attraction to investors in the financial markets. The bonds

Table 5 Individual country's regression output (dependent variable = Rportf)

Variables	Botswana	Cote d'Ivoire	Kenya	Mauritius	Nigeria	Tunisia
Constant	1522200	12550605	24720178	1081934	1.21E+08	6374338
	(15.025)	(8.3294)	(8.1167)	(18.993)	(6.9323)	(14.058)
GNI	39.49334	3314.301	11765.36	13.00614	15592.61	885.9772
	(4.3580)***	(6.7038)***	(7.6284)***	(3.1235)***	(5.894)***	(7.597)***
IntSp	−9153.338	−136923.8	−274722.2	350.3688	414336.6	97293.22
	(−0.8035)	(−0.9770)	(−2.37)**	(0.3494)	(0.6389)	(1.8865)*
OERX	27552.07	2616.936	83275.16	2204.236	−90679.36	762574.2
	(2.9493)**	(2.5231)**	(3.2600)***	(1.8613)*	(−0.6050)	(2.8718)***
RG	8.80E−06	0.000364	−6.29E−05	−4.31E−0	0.000227	−9.57E−05
	(1.5641)	(4.0093)***	(−0.2667)	(−0.5610)	(2.5128)**	(−3.482)***
STKMR	178.39			120.4758	−28457.45	
	(0.7350)			(1.2409)	(−0.6127)	
R^2	0.9822	0.9881	0.9957	0.9705	0.9731	0.9769
Adj R^2	0.9670	0.9828	0.9930	0.9453	0.9463	0.9666
F-statistic	64.632	187.47	373.63	38.47	36.27	95.160
D.W.	2.206	1.923	1.272	1.720	1.959	1.790
Obs	23	14	23	23	23	23

Source: Outputs from data
***, **, * for 0.01, 0.05 and 0.1 levels of significance respectively

and equity markets show varied and less significant outputs across the countries. This is understandable as the markets are small and instruments few.

4.3 Recommendations

African FE countries must as matter of urgency address issues of high of interest rate spread in their economies which is one the main distractions from the bond markets. Firms borrowing from banks must be able to obtain loans while bonds market is developed to enable firms to take advantage of the financial market. Then portfolio flows can then be more meaningful trading in the bonds rather than taking advantage of the lack of depth in the equities market in these countries.

The FE countries must continue to work on their for the improvement of income in their countries as it is seen here that it is the most significant variable of attraction to the portfolio funds. While doing that, the countries must make policies that make portfolio fund to be less hot either by specifying minimum residency period or restricting the markets to which they can be invested. The African FE countries must expand their productive base to increase export and as such increase their

liquid reserves. Export capability would increase reserves and higher level of attraction to the portfolio investors since liquidity is important whenever there is the need to quickly exit from the market.

5 Summary and Conclusion

This chapter has discussed the issues of market instruments investments and portfolio investment in African FEs. Since returns in most financial markets of matured and EMEs have petered out, HFs have looked into investing in frontier economies and Africa is not excluded. The problem of market risks in these kinds of investment was discussed coupled with the fact that portfolio funds or HFs have been committing funds to various kinds of market instrument to ensure an above market average return. Most of the investments are in financial markets, namely equities and debt. The risks attaching to various investments are fully discussed. The method of the chapter adopted included the use of the variables that are market driven namely: bond and equity market. These variables are returns for the instruments and were used as measurements for analysis.

The paper elected to use the vector autogressive techniques to statistically estimate the impact of the adopted variables on the inflows of portfolio funds into African FEs. The paper observes that the adopted variables namely gross national income, exchange rates, stock market returns, interest rates spread, and liquid reserves were significant at various levels. The most significant was gross national income and exchange rates exerting both positive and negative impacts respectively. It is also discovered that the portfolio funds had negative impact on the stock market returns in the long term. Interest rate spread was not so significant with return perhaps because the bonds markets of African FEs are not so developed. Individual countries' regression indicate that increased income, exchange rates and liquid reserves are major attractions to the HFs and the paper consequently recommends the increase in productively to increase the income and liquid reserves of their respective countries.

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