

ECONOMIC INTEGRATION IN EASTERN AND SOUTHERN AFRICA REGION: A PERSPECTIVE ON EQUITY MARKETS

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1. Introduction

A discussion of Stock emerging¹ markets in the ES African region would not come into sight without an understanding of the astonishing changes which have taken place in the world and created the environment for the phenomenon we are concerned to analyze.

These changes can be summarized in two points: changes in the international environment with the phenomenon of globalization, and the wholly substantial economic performance in the region. However, the crucial change that has taken place since 1989 is that these nations are today more open for business in terms of both trade and investment. The region is reported to be 'submerged' by tremendous capital flows. Each country, taken individually, tends to be integrated into this global mainstream.

Stock markets in the region, as in the other emerging markets, are characterized by higher volatilities and higher returns. Experts agree on the fact that the economic reform programs initiated by many governments in the last decade, such as the liberalization of exchange rates and the opening up of the stock exchanges to international financial investors, have played a crucial role in the development of those markets, and the increasing interests from foreign investors.

2. What Matters in the Region? A Microstructure Overview

The globalization of financial markets has offered opportunities to increase private investment, raise production, and accelerate economic performance. Net foreign portfolio investment into the ES Africa region has also gained from this worldwide trend by surging from US\$ -62.37 millions in 1990 to a peak of US\$ 2.78 billions in

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¹ The International Finance Corporation (IFC) defines emerging markets such as those which have begun a process of changes, growing in both size and sophistication. Alternatively, it interprets 'emerging' as markets in developing economies likely to imply potential for development. Source: *IFC Emerging Markets Factbooks*, 1995

1996². Despite this spectacular increase, the region has attracted less than it could have done. International investors persist, indeed, in seeing Africa as a risky continent, overwhelmed with high political and economic risk. National governments have therefore recognized the need to implement deep reforms to allow their countries to compete for international commercial risk capital. Economic adjustment programs, combining structural reforms and macroeconomic stability, have been launched. Typical policy changes have included floating local currencies (devaluation), liberalizing interest rates and control of money supply (tightened liquidity), the reduction of public budget deficit, trade and payment liberalization, fiscal reform, privatization of State's own firms, banking system reform, fiscal and administrative reforms. All these changes have directly affected financial markets. Looking for new markets with high but safe returns, and shaken by the turmoil in the South East Asian markets, international investors have been looking for markets isolated from Asia's tumult. Africa could have been the appointed place. The ES African region has particularly taken advantage of this capital flight thanks to its sophisticated corporate governance and highly regulated banking sector. South Africa, specifically, reported as the developing world's third largest stock market, will easily attract net foreign equity investment.

Although some of these markets remain small and illiquid, they are growing rapidly and becoming an increasingly important part of their national economies. In terms of size and liquidity, all of the ES African stock markets can be considered as able to attract major international investors. Ranked in terms of market capitalization, those markets offer decent capacities (see Table 1).

The number of Stock markets in the ES African region has largely doubled over the last ten years. With the pioneers Kenya, South Africa and Zimbabwe, we can add new Exchanges in Botswana, Namibia and Swaziland, which have been established early in the 1990s. Besides these markets, other countries are planning to open, or already opened new bourses. This is the case for Malawi (1996), Mozambique, Tanzania, Uganda, which are reported to open their Exchanges soon. Therefore the financial place will merely explode in the region.

As stated previously, South Africa represents the most important financial place in

² Portfolio investment excluding liabilities constituting foreign authorities' reserves covers transactions in equity securities and debt securities (*The World Bank Development Indicators, 1999*).

the region with a listing of 626 quoted firms, an increasing capitalization from US\$ 137,540 million in 1990 to US\$ 241,571 millions in 1996, with an average annual growth rate of 10.95 %. Kenya and Zimbabwe follow with more than 50 listed companies and a capitalization which reaches US\$ 1,846 million for the first, and US\$ 3,635 million for the last one in 1996, which represents an average annual growth rate of 35.44 % and 29.41 % respectively. Namibian Stock Exchange (NSE) has grown rapidly and attracted interest from foreign investors. NSE's market capitalization has increased from US\$ 189 million in 1995 to US\$ 429 million at the end of 1998, making the NSE Africa's second biggest market, just after Johannesburg. This expansion can not only represent a significant trend toward attracting foreign private capital, but also an opportunity for their integration into the global financial market places. This trend also expresses the good political and economical environments in the region regardless of some important but isolated internal crisis.

Although the pace at which reforms have been introduced in the region varies from a country to another, international investors have been encouraged by the recent changes in the political and economic features to reduce the political instability and other problems such as infrastructure shortcomings, transaction charges, stamp duty and settlement delays, and corruption. Namibia, for example, has introduced reforms gradually while ensuring that the financial sector remains well managed and capitalized. Kenya and Zimbabwe, on the other hand, have suffered from lack of willingness from the State authorities, but have also encountered serious internal social crisis during reforms implementation. Nevertheless, the two countries have been required to undertake fundamental political reforms leading towards multi-party elections along with structural adjustment programs. International donors, to protest against political instability and institutionalized corruption, have included political reforms as a condition for foreign aid or assistance. South Africa, in turn, after a long way of international isolation, has known a peaceful period of transition from Apartheid to a direct democracy with stability, as far as the economy is concerned.

In terms of performances, 1998 returns in these markets have suffered from world equity markets turmoil, as investors worry about financial troubles in Asia and Russian whim. South Africa, for example, is reported to have registered disappointing results in 1998. The local Index has decreased by 12.4 % relative to the year before, heightening the bad result of the 1997. Namibia was also shaken by this result and finished the year with a decrease of the local index of -35.4 % despite of successive positive returns from 1995 to 1997. Zimbabwe, however, has suffered more from

internal turmoil such that the depreciation of its local dollar and social crisis diminished enthusiasm on what investors have long considered as a promoting place. The financial place at Harare will record simultaneously bad results with changes of the local Index of -18.1 % in 1997 and -10.9 % in 1998.

On the economic side, ES African countries have been enjoying the highest economic growth rate in the continent over the last fifteen years (see Figure 1). 1992 was a difficult year for three countries in the sample. Zimbabwe, for example, recorded a negative growth of -8.16 %, while South Africa and Kenya also recorded a slowdown of the activity at respectively -2.57 % and -0.74 %. Table 1.2 contains descriptive statistics for all the four countries. Data are provided for quarterly exchange rates, the rate of inflation and the interest rates, from the first quarter of 1990 to the first one of 1999. The rate of inflation, measured as the relative changes of the consumer price index, is the quarter- over- quarter rate. As shown in Figure 2, during the period under study, inflation has been relatively low but volatile, particularly in Kenya and Zimbabwe where we have recorded maximal inflation levels of respectively 15.22 % (second quarter of 1993 for Kenya) and 13.78 % (first quarter of 1998 for Zimbabwe).

Interesting facts emerge from Table 2 and Figure 2. Both Namibia and South Africa exhibit large increases in nominal interest rate in the 1994, and a steeper intensification at the beginning of 1997. This tendency seems to correspond to the tequila crisis in Mexico and the turmoil from Asian financial places. The increase in these rates can be explained by the concern of protecting the Rand particularly victim of speculative attacks.

Data on Zimbabwe, however, show a reverse trend. This contrast seems to result from the intense budgetary deficit and monetary policies undertaken by the government, even though analysis show moderate Consumer Price Inflation. Data also show that during this period, Namibia's nominal interest rates were less volatile than South Africa's rates.

In light of those preliminary information, we investigate in the following sections the importance of integration within a set of selected markets. In the next sections, after defining the concept of financial integration, we review the literature on how integration between countries has been explored. This will be followed by a discussion on the Geweke feedback measures of integration which are used in the econometric approach. We finally discuss on data, methodology and present then the econometric results.

3. Defining Integration

Many signs in the recent decades suggest that international capital markets have become increasingly integrated with the relaxation on international capital flows, the development of new financial instruments, the expansion of multinational corporations, and the reduction of costs due to the development of computing systems. The recent financial crisis [Mexico(1994), Asia (1997-98), Russia (1998), and Brazil (1999)] and the impressive speed of contagion and consequence across other international financial places, make us wonder whether any country today can isolate itself from, first, the general integration created by the international flows of private capital, and, second, by their respective regional integration due to higher exchange and trade between countries of the region.

Economic and financial literature tries to define integration in several ways. We present some of the features relative to this paper. Simply defined, *two markets are integrated if the prices in these markets fluctuate together*. The idea of price co-movement can be formalized by means of the correlation between the returns in each market. Thus perfect market integration implies that the return in one market is *perfectly correlated*³ with the simultaneous return in the other market. Markets are completely integrated if assets with the same risk have identical returns irrespective of the market. Risk refers to exposure to some common world factor. If a market is segmented from the rest of the world, its covariance with a common world factor may have little or no ability to explain its expected.

Therefore:

Market integration can be measured by the correlation coefficient between simultaneous returns in the markets. The higher the correlation coefficient, the stronger the market integration.

Another view holds that similar markets should assign similar prices to similar payoffs. So the more strongly the markets are integrated, the smaller the differences

³ It is important to note that low correlation does not mean segmentation as it can be due to industrial structure. Therefore low correlation between national stock market indices can be regarded as consistent with perfect capital markets integration. The lower the correlation, the greater the reduction of risk through diversification [Alder and Dumas (1983), Oxelheim (1990)].

in risk-adjustment in returns per time interval [Chen and Knez (1995)]. So,

Market integration can be measured by the minimum squared distance between stochastic discount factors in the markets. The stronger the market integration, the smaller the distance.

Oxelheim (1990) establishes the distinction between total, direct and indirect financial integration. Total (or perfect) integration means that expected real interest rates are the same on the markets concerned. Under direct financial integration, the law of one price is held, that is an investor can expect the same return on investments on different markets after the required adjustment for risk and transaction costs. Indirect financial integration, in turn, refers to a situation where the return on an investment in one country is indirectly linked to the return on investments in other countries. The influence is expressed by way of other markets such as the exchange market, or the goods market.

All these concepts present characteristics of markets but do not take into account how the degree of integration may fluctuate over time and what can explain these changes.

After a review of literature on how markets integration has been investigated, in the next sections we present the Geweke feedback statistics, which represent the cardinal measures of the degree of integration between a couple of stock markets with the important feature to possess an asymptotic distribution of probability.

4. Review of the Literature

Many studies have assumed that capital markets were perfectly integrated [Bekaert and Harvey (1995), Dumas and Solnik (1995), etc.]. Some empirical works, unfortunately, reject the hypotheses of integration between markets, by the same way their efficiency and the fundamental asset pricing models such as the capital asset pricing model. Other authors, in the other hand, confirm co-movement of markets trend, particularly when taking into account transactions costs [Goodwin and Grennes (1994), Phylaktys (1997)]. Yet another series of literature falls in the discussion between segmentation and integration. The advantage of these models has been to propose methodologies that allow the degree of markets integration to change

through time. Pioneers in this stream of literature used to test markets integration throughout real interest rate equalization, testing by the same time the purchasing power parity (PPP).

In their respective papers on the topic, Mishkin (1984), Merrick and Saunders (1986), investigating equalization of real interest rates across United States, Canada, the United Kingdom, France, West Germany, Netherlands and Switzerland from 1967:2 to 1984:2, fail to accept the equality of the mean of real rates in the seven countries suspected, nevertheless, to be perfectly integrated. The basic finding of the authors is that the equality of real interest rates across countries can be significantly rejected statistically, but not economically because neither *ex-ante* relative PPP nor the uncovered interest parity are rejected. They explain this phenomenon by econometric problems in regards of the error terms of the regressions used for the test. Indeed, because of the potential non-normality on the errors terms in regressions, the evidence of equalization is severely rejected.

For Goodwin and Grennes (1994), many reasons can justify the fact of not expecting the equalization of real interest rates to hold, even in a well integrated and efficient international credit markets.

The authors stress out two principal reasons:

- i) the existence of no-traded goods; and
- ii) the existence of transactions cost.

Thus, equalization of real interest rates may not be the appropriate criterion for well-integrated financial markets. In the presence of transactions costs, for example, national real interest rates may fluctuate independently of one another in response to localized changes in domestic supply and demand conditions.

Another limitation when regressing equalization of real interest rates is the possibility of non-stationarity of individual real rate series. If the individual series are non-stationary but trend together, the estimated maybe consistent but not the estimated standard errors, they argue. Then they propose to approach the problem by using cointegration techniques⁴. The intuition is that economic forces should prohibit persistent long-run deviation from equilibrium conditions, although significant short-run deviations maybe observed. Therefore, real interest rates in individual countries may wander, within the band created by transaction costs, independently of rates in other countries. The localized movement could occur in response to domestic financial

conditions. However, a long-run efficient equilibrium (arbitrage) in international markets should ensure that the individual rates do not wander arbitrarily apart.

In all, the results of cointegration testing provide strong support for a version of interests parity and market integration whereby real rates vary in a non-synchronous manner within the transactions cost band but maintain a long-run relationship such that no rate diverges from the equilibrium relationship. Following Goodwin and Grenne's suggestion, Phylaktis (1997), investigates the extent to which financial markets in the Pacific-Basin region have become integrated. She also analyses co-movement of real interest rates (by) using cointegration and error correction models to draw inference on the degree of capital market integration and to look at the speed of adjustment of real interest rates following shocks. She concludes that the greater the degree of capital mobility, the faster the adjustment to long-run equalization of real interest rates.

5. The Geweke Feedback Measures

The latest researches, on the other hand, allow returns in any country to be affected by their covariance with a world benchmark index return [Bekaert and Harvey (1995)] or allow returns to affect each another by a set of lagged returns [Crowder and Wohar (1998), Brackert, Scott Docking and Koch (1999)]. Statistics such as the feedback measures developed by Geweke are then computed and investigated upon the time to analyze the co-movement of markets.

Using the approach of covariance, Bekaert and Harvey (1995) define the integration measure as a time-varying weight that is applied to the covariance and the variance. Their model makes difference between the price of variance risk across countries, which depends on country-specific information, while the world price of covariance risk depends only on global information. Markets are initially supposed to be either fully integrated or fully segmented. When there is a switch (the switch can be

* The cointegration testing procedures appeal to the fact that deviations from equilibrium condition for two or more economic variables, which are non-stationary when taken by themselves, should be stationary. An important implication is that, while individual economic variables, such as real interest rates, may wander extensively, certain pairs or groups of such variables should not diverge from another in the long run. *'If these variables are cointegrated, they cannot move too far away from each other'*, Dickey *et al.* (1991).

partially expected or a surprise), from one form to the other, the valuation of payoffs and the stochastic process governing returns changes. To easily catch this switching-regime, the authors introduce an unobservable state variable, taking 1 when markets are thought integrated and a value of 2 when markets are segmented, which will help them to measure the regime probabilities. The regime probability will vary through time as new information will change.

In another direction from previous studies cited above, Brackert, Scott Docking and Koch (1999), investigate how and why different pairs of national equity markets display different degrees of co-movement over time, employing a two-step procedure to explore, first, the degree of co-movement for a given pair of markets and, second, why this interdependence varies over time. The authors estimate annual Geweke (1982) measures of feedback for different pairs of markets as the evolution of co-movement in time returns. As the degree of economic integration varies over time, we may expect the extent of equity market integration to vary systematically.

Contrarily to other statistics such as the traditional Wald F-test statistic, the statistic proposed by Geweke has the feature to have an asymptotic distribution. It represents the *cardinal measure of the degree of dependence, the extent of feed back*. With other methodology of investigating, such as Granger, we can only reject or fail to reject the null hypotheses under consideration. With Geweke measures, we also have a distributional theory under the alternative hypotheses that feedback is present.

In his paper, Geweke (1982) shows that linear dependence and feedback among two multiple time series X and Y can be measured such that linear dependence is the sum of linear feedback from X to Y , linear feedback from Y to X , and instantaneous linear feedback [Geweke (1982), pp. 307-309]. In our paper, we focus on the dynamic interrelationship between daily returns in two stock markets, r_{it} and r_{jt} , as suggested by Backer *et al.* (1999). Three kinds of factors may influence the daily returns of stocks reflecting more or less sensitivity:

- i) specific factors: sources of information that influence only the national market and not the others;
- ii) systematic factors: sources of information that also influence all the national markets;
- iii) the noise.

The Geweke interdependence model can thus be modeled by the following system

of equations:

$$r_{it} = a_0 + \sum_{k=1}^m a_k r_{i,t-k} + \sum_{k=1}^n \alpha_k r_{j,t-k} + \varepsilon_{it} \quad (1)$$

$$r_{jt} = b_0 + \sum_{k=1}^m b_k r_{j,t-k} + \sum_{k=1}^n \beta_k r_{i,t-k} + \varepsilon_{jt} \quad (2)$$

$$r_{it} = a'_0 + \sum_{k=1}^m a'_k r_{i,t-k} + \mu_{it} \quad (3)$$

$$r_{jt} = b'_0 + \sum_{k=1}^m b'_k r_{j,t-k} + \mu_{jt} \quad (4)$$

$$\text{with } \text{var}(\varepsilon_{it}) = \Sigma_1, \text{var}(\varepsilon_{jt}) = \Sigma_2, \text{and } \text{cov}(\varepsilon_{it}, \varepsilon_{jt}) = \begin{bmatrix} \Sigma_1 & \sigma_{12} \\ \sigma_{12} & \Sigma_2 \end{bmatrix} = \Omega, \text{var}(\mu_{it}) = \xi_1, \text{var}(\mu_{jt}) = \xi_2, \text{and } \text{cov}(\mu_{it}, \mu_{jt}) = 0 \quad (5)$$

The coefficients α_k and β_k illustrate how j market, respectively the i one, leads the i one, respectively the j one. This relationship appears in the covariance matrix Ω . Three null hypotheses can be run at this stage:

H_1 : *there is no contemporaneous relationship between r_{it} and r_{jt} on the same week;*

H_2 : *r_{it} does not lead r_{jt} across day, that is α_k for any k ;*

H_3 : *r_{jt} does not lead r_{it} across day, that is β_k for any k .*

In result, Geweke [1982, pp. 305-306] defines three measures of linear feedback. These measures can be constructed from the preceding system of equations. Inference about these measures can be based on estimates of these equations and on their estimated distribution. So, he defines:

the measures of linear feedback from r_{it} to r_{jt} , that is

$$T^* \hat{F}_{i \rightarrow j} = T^* \ln(\hat{\xi}_2 / \hat{\Sigma}_2) \quad (6)$$

the measures of linear feedback from r_{jt} to r_{it} , that is

$$T^* \hat{F}_{j \rightarrow i} = T^* \ln(\hat{\xi}_1 / \hat{\Sigma}_1) \quad (7)$$

and the measure of instantaneous linear feedback, that is

$$T^* \hat{F}_{ioj} = T^* \ln[(\hat{\Sigma}_1 * \hat{\Sigma}_2) / |\hat{\Omega}|] \quad (8)$$

If the multiple time series compound r_t is gaussian, the maximum likelihood of estimate of the three measures is then simple to construct, and their asymptotic distribution is the chi square under the three previous null hypotheses and may be approximated under the alternative. Therefore, under the three hypotheses H_1 to H_3 , the following tests can be computed:

if $T^* \hat{F}_{ioj} = 0$, then $T^* \hat{F}_{ioj} \xrightarrow{a} \chi_1^2$ under H_1 ;

if $T^* \hat{F}_{i \rightarrow j} = 0$, then $T^* \hat{F}_{i \rightarrow j} \xrightarrow{a} \chi_n^2$ under H_2 ;

if $T^* \hat{F}_{j \rightarrow i} = 0$, then $T^* \hat{F}_{j \rightarrow i} \xrightarrow{a} \chi_n^2$ under H_3 .

As a result, it is possible to compare contemporaneous feedback measures, $T^* \hat{F}_{ioj}$ across different terms, half years or years to reveal how the extent of co-movement varies over time for a given pair of markets.

The main problem when estimating the previous systems of equations is on the

number of lag parameters. Geweke argued that a longer lag path on the dependent variable in each equation, m , helps to ensure the errors not to be autocorrelated, while a small lag length on the right-hand-side variable, n , increases the power of the hypothesis test. Thus, the optimal lag length selection has been handled using the Akaike Information Criterion (AIC)⁵. After examining a set of AIC, optimal lengths of $m = 10$ days and $n = 5$ days have been selected. This criterion is consistent with Bracker *et al.* (1999). We can easily run null hypotheses that a given measure of feedback is zero or that causality is unidirectional [Granger (1969)].

6. Data, Methodology and The Estimated Geweke Measures

The sample of national equity markets include data from the International Finance Corporation (IFC) of the World Bank and National Stock Exchanges (case of Kenya, and Namibia). The IFC provides value-weighted indices of a representative sample of equities in each country covering at least sixty percent of the market's capitalization. The methodology employed in this study is based on Geweke (1982) and Bracker *et al.* (1999). The integration tests involve the estimation of the system developed in the Section 4 above.

Our study focuses on four emerging markets: Kenya, Namibia, South Africa, and Zimbabwe. The data employed are daily returns computed from national stock indices⁶. The summary statistics are presented in the Table 3. It represents a summary of quarterly returns of the overall market portfolios in local currencies. Data are in daily basis. They cover the period from the third quarter of 1995 to the second quarter of 1999, except for Kenya (first quarter of 1998).

The statistics include the average arithmetic returns and the correlations between them. As we can see correlations among these markets are relatively important, given remarks in footnote 3. Namibia and South Africa display a high correlation of 0.728990, which is not surprising in light of the large number of cross-listed firms. The

⁵ AIC = $T \cdot \ln$ (residual sum of squares) + $2 \cdot n$. T is the number of usable observations and n the number of parameters estimated. Ideally the AIC will be as small as possible.

⁶ $r_{it} = \ln \left(\frac{P_{it}}{P_{i,t-1}} \right)$

correlation between South Africa and Zimbabwe is also high at 0.64760. Nevertheless, Kenya, despite of the geographical distance, seems to be more related to Namibia and South Africa than to Zimbabwe.

The performance of those equity markets are simply exceptional. Ranked in their respective currency, Zimbabwe is the top performer, followed by South Africa and Namibia. Kenya is the only country to display a negative return during the period. The returns on Kenya are also shrunk by a foreign exchange rate depreciation of 2.82 % on the average during the period.

All these returns have not been achieved without risk. During the study period, Kenya displays a small level of risk despite of negative results, with a quarterly standard deviation of 0.784889 % on the average. Namibia (1.681826 %) and South Africa (1.729032 %) are very volatile during the concerned period. The two countries display a very low and stagnant level of risk till the third quarter of 1997, where consequences of the Asian turmoil are surely felt. Finally, Zimbabwe amazes with its second less risky place (1.488290 %). Total risk in all of the four markets, measured as the quarterly standard deviation of local currency returns, is on the average equal to 1.4210%.

Many economic time-series are not stationary at the levels [see Dickey and Fuller (1979, 1981)]. Applications of least square regressions to such series may lead to spurious regressions. In estimating Geweke measures of feedback, the stationarity of the series must be first established. Following the Dickey-Fuller test of unit root, the results indicate that the series are $I(0)$ at all conventional levels of confidence, that is they have no unit root, which means that they are stationary. We found that in all cases the null hypothesis of the presence of unit root is rejected at conventional levels, except for Zimbabwe in the fourth quarter of 1996. Moreover, it is not possible to reject the alternative hypothesis that these series converge through time. Therefore, the system of equations (1) to (4) are directly computed using OLS methods. For each quarter investigated, the analysis will generate three feedback measures for every pair of national stock markets. These measures reveal how markets are integrated and how each type of inter-market relationship varies over time. Table 4 provides the time series results of the quarterly unidirectional and contemporaneous feedback measures for these eight pairs of markets.

Let us consider first the results obtained for the simultaneous feedback measures. We have a total of 86 measures. Only 17 of them are significant in 0.05 (*), 0.025 (**), and 0.01 (***) levels of confidence. This suggests a very weak co-movement across

the pairs of returns within the same day, except for the pair Namibia – South Africa where ten over the sixteen of the contemporaneous feedback measures. As regard to the magnitude, results indicate important movements in the simultaneous feedback measures between the two countries. This suggests that extent of co-movement between the two countries has intensified during the concerned period but has also been unsteady, particularly between 1996:3 and 1998:3. Not only the couple contains more significant measures, it also exhibits the largest significant one. This reinforces the idea that Windhoek displays greater co-movement with the Johannesburg market with higher integration due more probably to the extent of trade and other exchanges between the countries, but also due to the fact that some of Namibian firms are still quoted in the Johannesburg place.

6.1 *Is South Africa still the leader in the Region?*

Table 4 also provides the measures of unidirectional feedback beyond one day, from the country *i* to the country *j*. Thirtyfive of these measures are significant at the three levels of confidence. Contrarily to what could have been expected, figures reported in Table 4 display a tendency for Namibia to be the leader relative to other markets. Indeed, we find 13 significant unidirectional feedback measures $Nam \rightarrow j$, 7 of which are from Namibia to South Africa, against 4 significant $Zaf \rightarrow j$, 2 of which are from South Africa to Namibia.

In terms of financial weight, liquidity and the quality of the financial services, the Johannesburg Stock Exchange (JSE) is however by far the largest in the region and in Africa. Although the JSE has experienced a surge activity during the studied period (particularly during 1997-98) with more than one hundred firms going public, the market capitalization at the end of 1998 totaled R1,001.6 billion, compared with R1,129.4 at the end of 1997, which represents a decline of 11.3%. In addition, the JSE All Share Index fell by about 12.4 % between the end of 1997 to the end of 1998, reflecting the impact of the Asian crisis in the investors confidence⁷ and the monotonous performance of the economy. Meanwhile, Namibian Stock Exchange (NSE) was growing rapidly and attracts increasing interest from foreign investors and

⁷ At the same period, South Africa government faced complaints about a double taxation system affecting particularly foreign investors and rumors on President Mandela's health as investors persist in believing Mr. Mandela to hold South Africa's stability and security

financial institutions. Not including leading South African stocks dual-listed on the JSE and the NSE, total market capitalization of the Windhoek place has boosted from US\$ 189 million in 1995 to US\$ 429 million at the end of 1998, making the NSE Africa's second biggest market, just after Johannesburg. The International Finance Corporation (IFC) rated the NSE as the world's sixth best stock market performance in 1995.

The NSE local share index, measuring the performance of now fifteen Namibian-owned firms, has performed more strongly than the JSE overall Shares Index and has also been less risky (see Table 1). One of the important factor to explain the NSE expansion is the support of the Namibian government, which has accorded a high priority to the development of the financial sector.

Since independence, the main government objective has been to sustain economic growth by facilitating foreign direct investment inflows, and by promoting the private sector. Taxes on income, profits and capital gains have been reduced to attract more foreign investors in 1989-1991, whereas taxes on trade will slightly increase during 1991-1992, but will be diminished in 1992 and will stay stagnant. There are no restrictions on foreign investment which can be done using the financial Rand mechanism. In 1990, a foreign investment act has been initiated to encourage foreign investment. No local preference or participation will be required in the future. The act also assures the protection of investments, and the free repatriations of profits. Other incentive measures have been taken to encourage investment and trade. In 1993, manufacturing incentives, applicable to new and existing firms, proposed a fifty percent corporate tax abatement for five years, phased out over ten years. As a result, the NSE will profit of this set of reforms and sustained economic performance.

In addition, we obtain 13 $i \rightarrow Zaf$ measures with 6 $Nam \rightarrow Zaf$, and 8 $i \rightarrow Nam$ with 2 $Zaf \rightarrow Nam$. Figures also show that Kenya (Table 6), despite of the geographical distance, has more significant simultaneous and unidirectional feedback measures with Namibia and South Africa than with Zimbabwe, with a higher value degree of integration with South Africa in the third quarter of 1998. This result confirms what has been observed when analyzing correlations between national returns (Table 3).

The basic finding of the paper is that markets in the ES African region are weakly integrated in view of the lack of significance in Table 4, despite of some robust findings

* Remember that we have computed nominal returns in local currencies. Thus the Geweke feedback measures may be biased by the influence of national inflations and cross-countries exchange rates.

(Table 5). The lack of significance may be due to technical or econometric problems^a or to the macroeconomic environment in the region. It appears therefore important to ask why in the economic sense there is so less or weak integration between these markets, some of them geographically closed. The next stage of the study tries to give answers to this question.

7. Economic Determinants of Integration

Although stock markets are not a panacea for African economic and financial problems in general, they are an important instrument which may be integrated into a larger economic strategy. As argued by Kenny and Moss (1998), operational financial markets are one way of building credibility among investors, particularly foreign investors, and signaling a country's financial health. Financial integration will therefore be interpreted as the result of market efficiency, and macroeconomic stability. However, in view of the few number of statistically significant feedback measures for the ES Africa region, much has to be done to favor integration between the markets considered.

As we have said before, ES African countries have responded to improve their economic environment. Sound macroeconomic policies have indeed been undertaken to create this new environment. In the regulatory and settlement view, much has also been achieved. Improved communications and information technology have facilitated transactions, despite of some delays reported for example in Kenya, and bureaucratic inertia, which is stated to delay settlement procedures and to discourage investors. In Zimbabwe, one reports that registration can take over 2 months [Kenny and Moss (1998)]. There is also the continuing fear of political turmoil or reversal of economic efforts. As stated above, the ES region has the particularity to be politically stable despite of some internal crisis, notably in Kenya and Zimbabwe. In Zimbabwe, for example, economic conditions have failed to improve, in part because of sustained mismanagement and impressive opposition to the president. In 1995, the Zanu (the Zimbabwe African National Union-Patriotic Front under the authority of the current president, Robert Mugabe) won almost all seats in the general election at the same time as a drought was striking the economy, and the IMF program was cut. In 1997, after a new victory without fighting, the president Mugabe faced protests by war veterans to pay gratuities. The president announced large-scale expropriations of

white-owned land to satisfy demonstrators. Economic conditions worsened and the currency came under attack.

The experience in Kenya presents also some radical and confused changes since the beginning of the 90s. Until recently, the country enjoyed an important development in capital market with a small but emerging equities market. The gradual structural reforms have been gradually supported by donors abroad, notably the International Monetary Fund and the World Bank. However, the country will complicate its situation. The big problems of Kenya can be summarized in political instability, and corruption⁹. The Kenyan will then suffer an aid freeze from both the IMF and the World Bank and from donor governments to protest against the mounting corruption and the political and economic failings (see: KENYA, *Financial Times Survey*, Tuesday, May 10, 1994). This experience brings to light the problem of the implementation of macroeconomic reforms. While the government has taken some measures to liberalize foreign exchange and to privatize unproductive State-owned firms, the lack of adequate reserves, the poor management of the economy caused by apparently politically-supported institutions will contribute fully to set Kenya back and reinforce foreign investors fear.

The lack of domestic participation is also one of the problems keeping stock markets firms from expanding. If African themselves are keen to invest in their local markets it can be interpreted as a positive sign by investors abroad. One of principal feature characterizing the ES African markets, as all African ones, is the low liquidity. Microstructures' literature defines the liquidity as the ability to buy or sell both quickly and without substantially moving prices [Glen J. (1994)]. Markets in the ES African region display a very slow level of liquidity, measured as the ratio stock traded over the GDP. For the period 1990-96, South Africa is on the average the most liquid market in the region with a ration of 11.36008 %, followed by Zimbabwe with 1.701198 %. Kenya has a level of liquidity of 0.43157 % and Namibia is the last one with 0.369405 %. This can also explain why these markets have been extremely volatile.

Macroeconomic instability, particularly, tends to favor segmentation among markets. In a survey led by the IFC concerning how businesses see government, six categories of obstacles are drawn as results of a survey on entrepreneurs and other

⁹ Kenya scores 74th less corrupted country (or 11th corrupted one) in the Transparency International Corruption Perception Index ranking country from the less to the most corrupted.

investors: regulations, trade and exchange rate policies, inflation and financing, public revenue and expenditure policies, uncertainty, corruption and crime. Table 6 provides risk ratings from the International Country Risk Guide. As we can see, international investors consider the ES region as being relatively calm. Kenya and Zimbabwe exhibit lower risk rating. Namibia is considered to be more politically risky this year than last year due probably to its involvement, with Zimbabwe, in the war in the Democratic Republic of Congo. These barriers have direct relation with the regulatory and accounting environment, as they are also linked to the bureaucratic efficiency, the quality of the judiciary system, etc. As investors have not necessarily adequate information on all the markets and on the financial health of the companies, these indicators will play the fundamental role of guiding their investments. We can therefore expect them to be correlated to the degree of integration. More, we can interpret higher degree of integration as the result of good economic and financial health, and obviously openness. To judge the effects of these restrictions and investors feelings abroad, we computed a inquiry based on correlations between market integration and different indicators of economic and financial security. For this purpose, we use average values of indicators such as the budget balance (as a percentage of GDP), the level of corruption, current account as a percentage of total exports, debt service (as a percentage of total exports); the economic, financial and fiscal risk levels, exchange rate stability, the foreign solvency (foreign debt as a percentage of GDP), the government stability measure, the international liquidity (months of import cover), the investment profile; two measures of liquidity (stock traded over the GDP, stock turnover times and the relative size), a measure of openness (sum of the exports and imports over the GDP), the political stability and the relative size.

The correlations in Table 7 provide interesting figures concerning market integration. We find that the degree of integration is negatively correlated to corruption, debt service, fiscal risk, and the foreign solvency, while it exhibits positive statistics with the other indicators. Market integration is most significantly associated with the international liquidity¹⁰ than to liquidity 1 and 2. This result suggests that foreign investors care more about the international macroeconomic stability (financial risk, international liquidity, etc.) than about a fundamental analysis as they may have

¹⁰ The indicator provides a comparative liquidity ratio that indicates how many months of imports can be financed with reserves (*International Country Risk Guide*).

difficulties to obtain adequate information on certain national firms in the region.

Current account deficit can be considered here, both with the measure of openness, as excellent indicators of the sensibility of the degree of integration to capital inflows, even though they don't necessarily represent any instability. In view of the positive and high significance of these rank correlation, we can claim that market integration is positively related to higher trade and capital inflows between the countries. This leads to prospect for more openness and exchange, as some countries in the region such as Zimbabwe are reported to be particularly closed.

As we could expect, political risk, with a significant statistic of 0.9854, is positively associated with market segmentation. Indeed, we have said before that the lower the political risk rating the higher the risk. As the correlation is perfectly positive, we can thus interpret an increasing in the rating to favor integration between markets. Not surprisingly, the investment profile of countries favor integration between markets.

The other results are also robust. It is the case of the fiscal risk indicators which is negatively correlated with integration (-0.9249). Contrarily to other indicators of risk, we compute the fiscal risk indicator such that the lower the risk point the lower the risk¹¹. This consideration allows to assess that the higher fiscal risk is positively related to market segmentation or the lower the fiscal risk the higher the integration. This result can also explain why Namibia seems to exhibit higher influence in the region than South Africa, despite of Johannesburg's weight. As stated previously, foreign investors still complain on the double taxation system of South Africa and other regulations affecting foreign investors [*The Salomon Smith Barney Guide to World Equity Markets* (1999), pp. 467-468]. This can also suggest fiscal reforms or tax break to attract more foreign investment.

8. Conclusion

In this paper, we examine capital market integration in the Eastern and Southern Africa region. The approach used focuses on the degree of integration between markets, as evidenced by daily returns. To measure the degree of integration, we use Geweke feedback statistics which can be considered as cardinal measures of integration. Contrarily to other statistics of inference, the Geweke feedback measures have the feature to have an asymptotic χ^2 distribution. Our estimated Geweke statistics, when investigating the ES Africa region, indicate significant but few inter-

market responses across couples of markets. This finding suggests that financial markets in the region, except for the couple Namibia and South Africa, are weakly integrated. Data also display changes for Namibia to become a notable place in the region in view of large significant measures of influence from Windhoek to the other capitals.

The results of the paper have moreover important policy implication, for the region first and for the continent in general. Although stock exchanges are not magic portion for Africa's financial problem, they can be thought in a larger economy policy. They can indeed play the important role of helping countries to attract more private investment, particularly ventured capital. They can highlight policy-makers, experts, and investors on the financial state of countries, as they can also be an indicator of financial integration considering that market integration is the result of (free) capital mobility, market efficiency, and macroeconomic stability. The policy suggestion at this stage is that economies in the region should try to reform or improve the private and financial sectors. Governments have also to create incentives by reducing political influence on the market. Although, foreign investment is clearly important to attract, the long-term objective should be to encourage new investment by increasing domestic participation.

Therefore, integration into regional and international financial markets can only represent an important way for the countries to attract more foreign capital. This can also be the opportunity to get out economic marginalization and to pull into the global economy trend.

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Table 1: SE African Stock Markets

	Listings ^a	Opening	Capitalization ^c		Returns ^b	Value traded ^c
			1990	1996		
Kenya	56	1954	453	1,846	-13.0	67
Namibia	12	1992	...	473	+13.0	78
South Africa	626	1887	137,540	241,571	-10.0	2702
Zimbabwe	64	1940	2,395	3,635	-52.0	255

a: number of domestic companies, 1996; b: US\$, 1997; c: US\$ millions, 1996

Sources: The World Bank Development Indicators & IFC's Emerging Stock Markets Factbooks (1998)

Table 2: Macroeconomic Indicators: Descriptive Statistics (90:1 to 99:1)

KENYA						NAMIBIA					
Exchange rate		Inflation		Interest rates		Exchange rate		Inflation		Interest rates	
Mn	Sd	Mn	Sd	Mn	Sd	Mn	Sd	Mn	Sd	Mn	Sd
82.16	3.72	3.77	4.54	15.64	2.47	3.80	1.08	2.08	1.33	11.55	1.55
Max.: 68.45		Max.: 15.22		Max.: 20.68		Max.: 6.21		Max.: 6.35		Max.: 14.24	
Min.: 22.09		Min.: -3.70		Min.: 10.87		Min.: 2.53		Min.: ...		Min.: 8.68	
# obs.: 37		# obs.: 38		# obs.: 23		# obs.: 38		# obs.: 38		# obs.: 33	

SOUTH AFRICA						ZIMBABWE					
Exchange rate		Inflation		Interest rates		Exchange rate		Inflation		Interest rates	
Mn	Sd	Mn	Sd	Mn	Sd	Mn	Sd	Mn	Sd	Mn	Sd
3.80	1.08	2.23	1.13	14.75	2.66	10.43	9.25	5.35	3.37	5.34	7.65
Max.: 6.21		Max.: 4.42		Max.: 19.85		Max.: 38.77		Max.: 13.78		Max.: 34.50	
Min.: 2.53		Min.: ...		Min.: 10.30		Min.: 2.30		Min.: -0.51		Min.: 8.25	
# obs.: 38		# obs.: 38		# obs.: 37		# obs.: 38		# obs.: 38		# obs.: 37	

Sources: International Financial Statistics Database; Mn: Mean, Sd: Standard deviation

Table 3: Summary Statistics of the Quarterly National Equity Returns

Country	Start	Arithmetic Mean	Correlations			
			KEN	NAM	ZAF	ZWE
KEN	95:III-98:I	-0.01623	1	0.39683	0.34056	0.12524
NAM	95:III-99:II	0.04692	0.39683	1	0.72899	0.29432
ZAF	95:III-99:II	0.06937	0.34056	0.72899	1	0.64760
ZWE	95:III-99:II	0.16002	0.12524	0.29432	0.64760	1

Table 4a: Geweke Feedback Measures of Integration

Date	Couple of Countries	TFi→j	TFj→i	TFioj
1995:III	Kenya – South Africa	5.040326	8.263783	0.292564
1995:IV	Kenya – South Africa	9.692679	18.1737***	3.42E-05
1996:I	Kenya – South Africa	4.016468	3.148161	1.559005
1996:II	Kenya – South Africa	17.04614***	4.896706	0.909052
1996:III	Kenya – South Africa	7.149888	6.224927	0.574217
1996:IV	Kenya – South Africa	11.0716*	7.200757	0.15878
1997:I	Kenya – South Africa	4.80053	10.73766	0.047532
1997:II	Kenya – South Africa	4.653271	6.843899	0.136731
1997:III	Kenya – South Africa	2.952914	7.733092	5.394472**
1997:IV	Kenya – South Africa	8.49309	4.671747	28.32111***
1998:I	Kenya – South Africa	10.92108	4.569707	0.41779
1998:II	Kenya – South Africa			
1998:III	Kenya – South Africa	79.54811***	7.752599	0.332521
1998:IV	Kenya – South Africa			
1999:I	Kenya – South Africa			
1999:II	Kenya – South Africa			
1995:III	Namibia – South Africa	8.05378	10.56401	0.462219
1995:IV	Namibia – South Africa	22.32941***	10.02785	12.98005***
1996:I	Namibia – South Africa	14.78488**	4.100794	9.624701***
1996:II	Namibia – South Africa	7.736088	2.538177	0.10909
1996:III	Namibia – South Africa	4.481568	5.361772	10.84028***
1996:IV	Namibia – South Africa	11.50683*	4.863495	77.50727***
1997:I	Namibia – South Africa	4.153534	6.75236	12.93284***
1997:II	Namibia – South Africa	0.592585	10.09922	18.47698***
1997:III	Namibia – South Africa	6.195017	6.816611	61.75637***
1997:IV	Namibia – South Africa	8.254271	7.924785	87.87532***
1998:I	Namibia – South Africa	23.63818***	4.259614	29.61226***
1998:II	Namibia – South Africa	5.501639	8.122237	108.6247***
1998:III	Namibia – South Africa	79.54811***	7.752599	0.332521
1998:IV	Namibia – South Africa	49.6395***	4.575293	3.63204
1999:I	Namibia – South Africa	5.730463	19.18647***	1.502636
1999:II	Namibia – South Africa	18.76001***	22.95305***	1.056034

The table reports the quarterly unidirectional and contemporaneous Geweke measures between a couple of countries, from 1995:III to 1999:II. These statistics measures the extent of a relation from each country's daily returns. The larger the measures, the greater the extent of unidirectional and contemporaneous relationship. The two first measures have an asymptotic χ^2 distribution with 5 df under H_0 and H_2 , whereas the last one has an asymptotic χ^2 distribution with 1 df under H_1 .

Table 4b: Geweke Feedback Measures of Integration

Date	Couple of Countries	TFI _{i→j}	TFI _{j→i}	TFI _{0j}
1995:III	Zimbabwe-South Africa	5.040326	8.263783	2.731533
1995:IV	Zimbabwe-South Africa	22.32941***	10.02785	0.026573
1996:I	Zimbabwe-South Africa	2.368643	3.802283	0.575491
1996:II	Zimbabwe-South Africa	7.736088	2.538177	0.199462
1996:III	Zimbabwe-South Africa	4.249407	10.22631	1.638468
1996:IV	Zimbabwe-South Africa	7.355523	2.213483	2.44405
1997:I	Zimbabwe-South Africa	2.370511	3.68577	0.024569
1997:II	Zimbabwe-South Africa	6.662791	5.352782	0.530598
1997:III	Zimbabwe-South Africa	21.15684***	1.827125	1.806393
1997:IV	Zimbabwe-South Africa	4.787887	1.288035	0.235624
1998:I	Zimbabwe-South Africa	1.548152	2.36916	0.009508
1998:II	Zimbabwe-South Africa	2.593864	3.178917	0.07358
1998:III	Zimbabwe-South Africa	1.084566	6.001069	3.075971
1998:IV	Zimbabwe-South Africa	9.448427	11.65417*	0.089476
1999:I	Zimbabwe-South Africa	14.63746**	10.02564	2.46884
1999:II	Zimbabwe-South Africa	8.090628	5.019139	12.58039***
1995:I	Kenya - Zimbabwe	2.559213	10.31092	0.894204
1995:II	Kenya - Zimbabwe	8.008075	7.422575	1.042778
1996:I	Kenya - Zimbabwe	11.19742*	6.399437	0.65889
1996:II	Kenya - Zimbabwe	3.133574	2.855256	0.099343
1996:III	Kenya - Zimbabwe	9.613892	14.69179**	0.890811
1996:IV	Kenya - Zimbabwe	2.520351	6.764982	0.771667
1997:I	Kenya - Zimbabwe	17.37095***	9.730868	0.049624
1997:II	Kenya - Zimbabwe	4.884481	17.84852***	1.548342
1997:III	Kenya - Zimbabwe	6.975809	7.347857	0.789437
1997:IV	Kenya - Zimbabwe	0.504166	3.92036	1.42304
1998:I	Kenya - Zimbabwe	5.71934	12.37696*	0.045447
1998:II	Kenya - Zimbabwe			
1998:III	Kenya - Zimbabwe			
1998:IV	Kenya - Zimbabwe			
1999:I	Kenya - Zimbabwe			
1999:II	Kenya - Zimbabwe			

The table reports the quarterly unidirectional and contemporaneous Geweke measures between a couple of countries, from 1995:III to 1999:II. These statistics measures the extent of a relation from each country's daily returns. The larger the measures, the greater the extent of unidirectional and contemporaneous relationship. The two first measures have an asymptotic χ^2 distribution with 5 df under H_0 and H_1 , whereas the last one has an asymptotic χ^2 distribution with 1 df under H_0 .

Table 4c: Geweke Feedback Measures of Integration

Date	Couple of Countries	TFI \rightarrow J	TFJ \rightarrow I	TFI \leftrightarrow J
1995:III	Namibia-Zimbabwe	13.59047**	3.231849	4.359677*
1995:IV	Namibia-Zimbabwe	9.831684	9.249738	4.197118*
1996:I	Namibia-Zimbabwe	2.672311	4.266926	0.147457
1996:II	Namibia-Zimbabwe	5.247179	13.95853**	2.255584
1996:III	Namibia-Zimbabwe	12.3593*	5.333669	0.379056
1996:IV	Namibia-Zimbabwe	3.784281	5.911246	3.028654
1997:I	Namibia-Zimbabwe	4.286734	6.774775	4.134687*
1997:II	Namibia-Zimbabwe	4.595921	4.629925	0.884702
1997:III	Namibia-Zimbabwe	2.915913	17.6103***	2.152039
1997:IV	Namibia-Zimbabwe	0.464933	0.580882	0.027814
1998:I	Namibia-Zimbabwe	0.876611	3.761418	0.848399
1998:II	Namibia-Zimbabwe	7.985933	3.776929	0.204531
1998:III	Namibia-Zimbabwe	12.42489*	7.738794	0.118493
1998:IV	Namibia-Zimbabwe	7.953795	7.471029	0.044118
1999:I	Namibia-Zimbabwe	2.287448	17.47939***	0.748983
1999:II	Namibia-Zimbabwe	2.925311	2.954028	0.217064
1995:I	Kenya - Namibia	12.73284*	12.93888**	0.370809
1995:II	Kenya - Namibia	3.039227	7.666852	0.92992
1996:I	Kenya - Namibia	1.205438	6.057455	1.339409
1996:II	Kenya - Namibia	20.24849***	11.92079*	0.896642
1996:III	Kenya - Namibia	5.520484	13.38964**	0.095359
1996:IV	Kenya - Namibia	12.24564*	9.651012	0.081998
1997:I	Kenya - Namibia	2.285095	0.320892	0.012407
1997:II	Kenya - Namibia	-1.68514	5.193502	0.015768
1997:III	Kenya - Namibia	-0.55641	8.40467	3.224491
1997:IV	Kenya - Namibia	5.769537	6.172655	9.973851***
1998:I	Kenya - Namibia	8.882892	10.37961	2.455409
1998:II	Kenya - Namibia			
1998:III	Kenya - Namibia			
1998:IV	Kenya - Namibia			
1999:I	Kenya - Namibia			
1999:II	Kenya - Namibia			

The table reports the quarterly unidirectional and contemporaneous Geweke measures between a couple of countries, from 1995:III to 1999:II. These statistics measures the extent of a relation from each country's daily returns. The larger the measures, the greater the extent of unidirectional and contemporaneous relationship. The two first measures have an asymptotic χ^2 distribution with 5 df under H_0 and H_1 , whereas the last one has an asymptotic χ^2 distribution with 1 df under H_1 .

Table 5: Degrees of Integration – Overall Ranking

Significant Unidirectional feedback measures		
Ken → j: 8	i → Ken: 7	Ken → Nam: 3
Nam → j: 13	i → Nam: 8	Ken → Zaf: 3
Zaf → j: 4	i → Zaf: 13	Ken → Zwe: 3
Zwe → j: 9	i → Zwe: 6	...
Total: 34	Total: 34	Total: 8
Nam → Ken: 3	Zaf → Ken: 1	Zwe → Ken: 3
Nam → Zaf: 7	Zaf → Nam: 1	Zwe → Nam: 3
Nam → Zwe: 3	Zaf → Zwe: 1	Zwe → Zaf: 3
Total: 13	Total: 4	Total: 9
Significant Simultaneous feedback measures		
Ken ↔ Nam: 1	Ken ↔ Zaf: 2	Ken ↔ Zwe: 0
Nam ↔ Zaf: 10	Nam ↔ Zwe: 3	Zaf ↔ Zwe: 1
Ken ↔ i: 3	Nam ↔ i: 14	
Zaf ↔ i: 13	Zwe ↔ i: 4	
Overall Ranking		
Country	Computation ¹²	Degree of Integration
Kenya	$1/3 \cdot (8+7+3) =$	6
Namibia	$1/3 \cdot (13+8+14) =$	11.67
South Africa	$1/3 \cdot (4+13+13) =$	10
Zimbabwe	$1/3 \cdot (9+6+4) =$	6.33

¹² This is the arithmetic mean of the numbers of significant feedback measures. So, for Kenya we have 8 Ken→j, 7 i→Ken and 3 Ken↔i.

Table 6: International Risk Rating (98:II – 99:II)

COUNTRY	Political Risk	Financial Risk	Economic Risk	Year ago
Kenya	55	33	34.5	61.8
Namibia	77	43.5	36.8	77.3
South Africa	67	38.5	31.4	69.8
Zimbabwe	57	22	24.1	49

International Country Risk Guide, www.prsgroup.com, July 1999. The lower the risk point, the higher the risk.

Table 7: Correlations between Market Integration and Economic, Financial and Political Security Indicators

<i>Integration</i>	<i>Current Account</i>	<i>Debt Service</i>	<i>Economic risk</i>	<i>Exchange rate Stability</i>	<i>Financial Risk</i>
1.0000	0.8672	-0.9978	0.5459	0.5098	0.8489
<i>Fiscal Risk</i>	<i>Integration</i>	<i>Political Risk</i>	<i>Corruption</i>	<i>Foreign Solvency</i>	<i>Government Stability</i>
-0.9249	1.0000	0.9854	-0.9684	-0.9967	0.7888
<i>International liquidity</i>	<i>Investment profile</i>	<i>Openness</i>	<i>Relative size</i>	<i>Liquidity1</i>	<i>Liquidity2</i>
0.4200	0.8563	0.7492	0.3523	0.3037	0.3554

Figure 1. Annual GDP growth (in %)

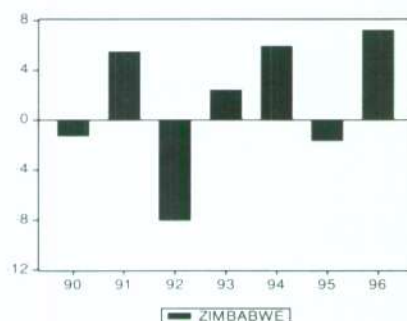
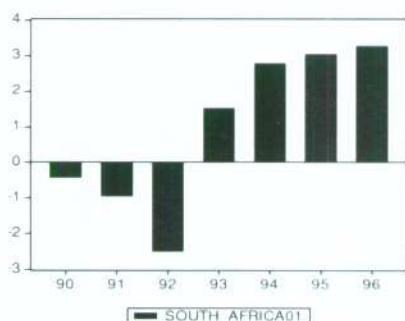
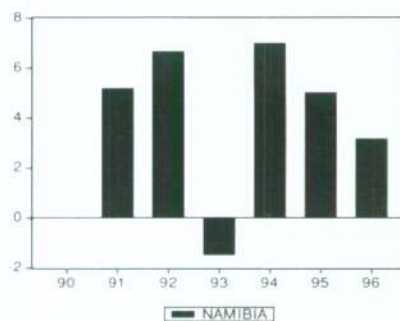
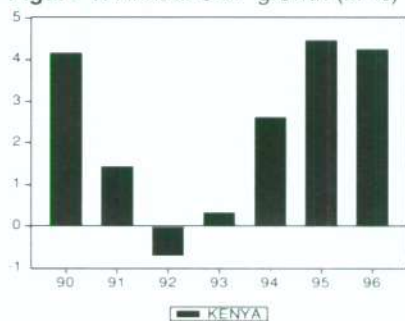
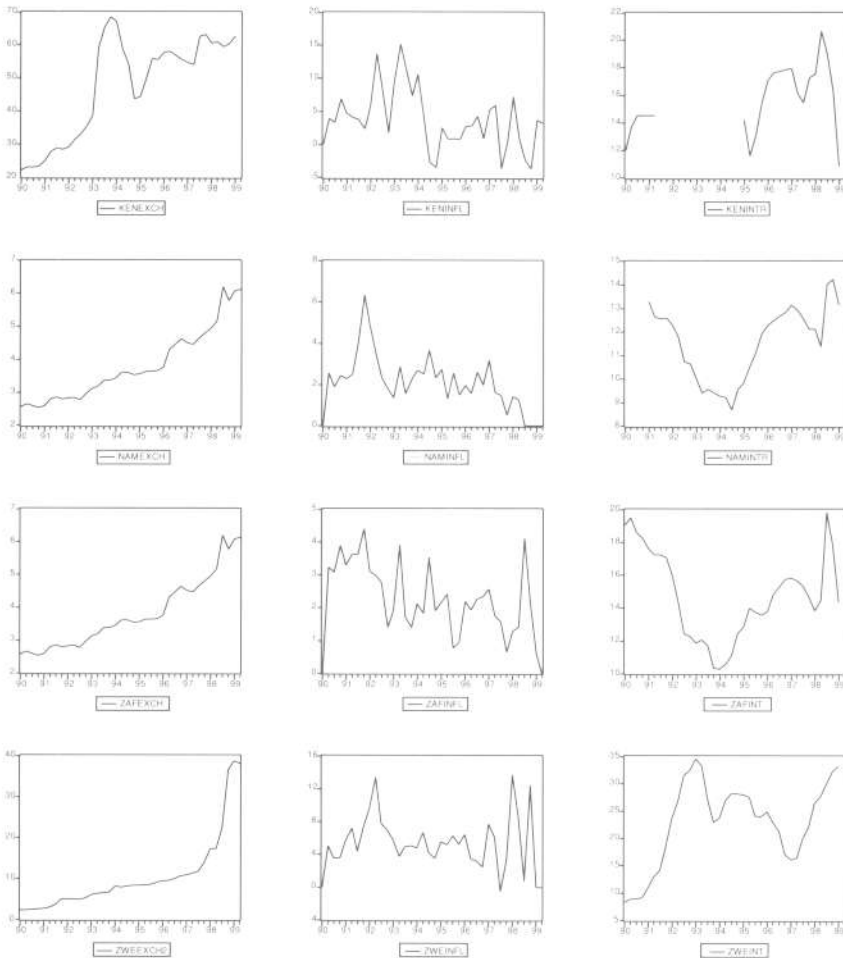


Figure 2. Exchange Rates with respect to U.S. Dollar, Inflation Rates, Nominal Deposit Interest Rates (Quarterly Data, 1990:1-99:1)



Abstract

The paper investigates a return-based measure of integration for four African equity markets.

It examines the development of equity market institutions, notably the stock exchanges of Kenya, Namibia, South Africa, and Zimbabwe, in Eastern and Southern (next ES) Africa. Besides providing a perspective on the scope, nature, and development of these markets, the paper seeks to shed some light on two relevant issues that have tended to dominate the financial literature on equity markets. First, the issue of whether these markets are integrated regionally and internationally, is discussed through analytical method based on the debatable assumption that the integration of markets can be viewed in terms of the co-movement of Overall National Share Indices. Second, the issue of whether the extent of integration between markets varies over time, and the factor that may contribute to this variation, is investigated by examining econometrically the relationship between the more robust measures of markets integration, such as those developed by Geweke (1982), and by hypothesizing the set of variables relating to the regional economies.

INTÉGRATION ÉCONOMIQUE EN AFRIQUE DE L'EST ET DU SUD: UNE PERSPECTIVE SUR LES MARCHÉS FINANCIERS

Résumé

Le papier mesure, grâce à une analyse basée sur la rentabilité, l'intégration économique de quatre marchés financiers Africains. Il examine, en effet, le développement des marchés financiers, particulièrement ceux du Kenya, de la Namibie, de l'Afrique du Sud, et du Zimbabwe, dans la région de l'Est et du Sud de l'Afrique. Tout en abordant succinctement la nature et la vitesse de développement de ces marchés, le papier cherche avant tout à répondre à des questions pertinentes qui ont dominé la littérature financière sur les marchés émergents.

Il essaye en premier lieu de répondre à la question de savoir si ces marchés sont intégrés régionalement et internationalement, à travers une méthode basée sur l'hypothèse fondamentale que l'intégration des marchés peut être examinée par l'évolution conjointe des indices financiers nationaux. En deuxième lieu, il tente d'évaluer par le biais de mesures statistiques robustes, l'ampleur de l'intégration de ces marchés ainsi que les facteurs qui peuvent contribuer à l'évolution dans le temps de leurs degrés d'intégration, grâce notamment à une approche économétrique proposée par Geweke (1982).



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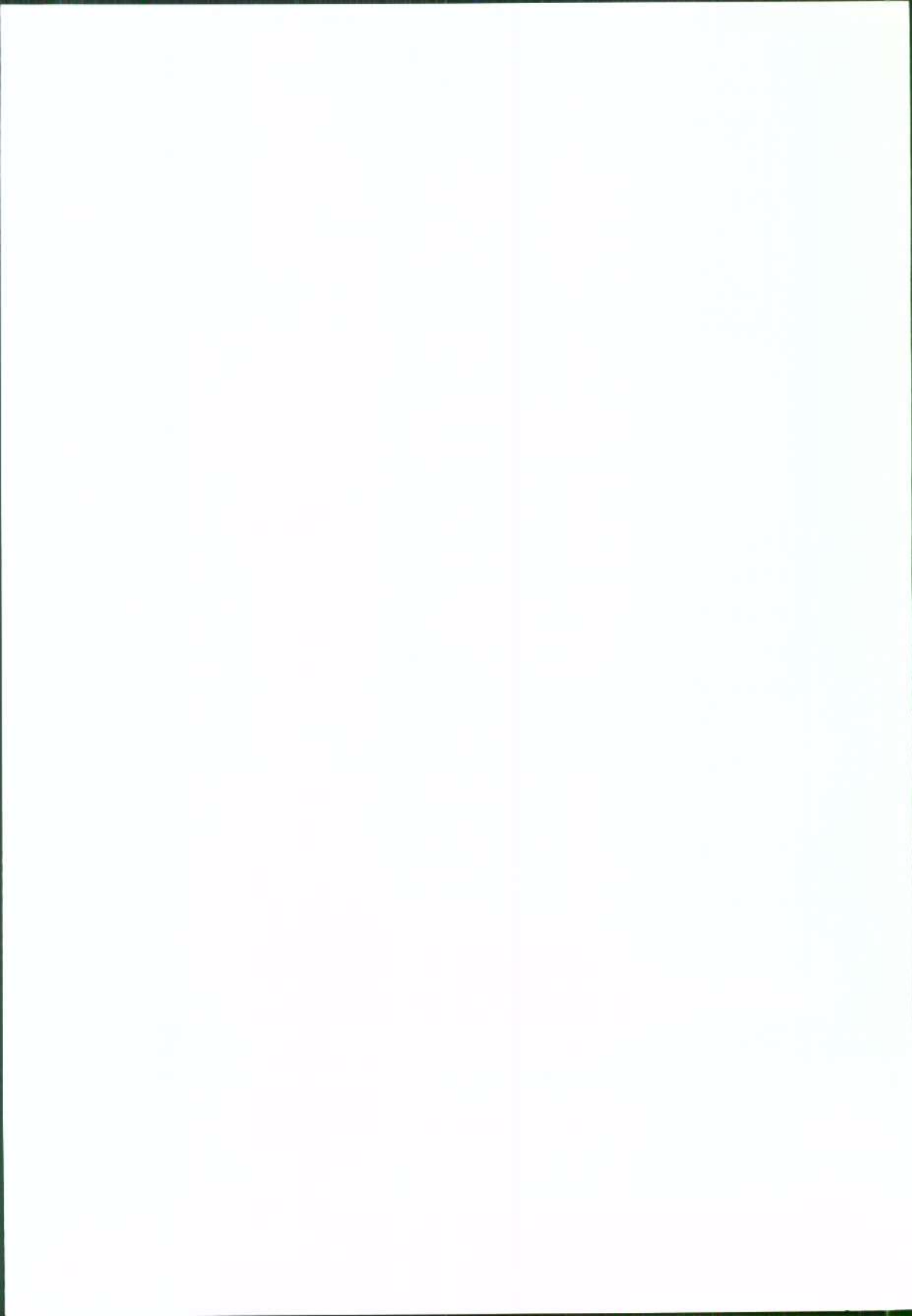
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