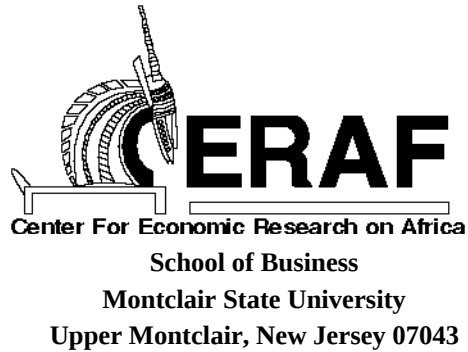




International Portfolio Diversification and African Economies: Evidence from Daily Data

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Abstract

We employ a methodology based on Markowitz-Tobin portfolio theory to empirically investigate potential benefits to a US investor from diversifying into equity markets in Africa. We infer, based on the state of these economies for the period studied, that significant potential gains accrue to a US investor from such diversification. For the optimal diversification strategy combination, portfolio equilibrium involves positive portfolio weights in all four countries; an outcome that is unambiguously conducive to African regional economic growth.

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1. Introduction

Using daily data, this paper empirically investigates the potential benefits to a U.S. investor from diversifying its investment portfolio into the economies of African countries. It also identifies some qualitative mutual benefits that may accrue from such diversification strategy. Although, little is known of this, there are currently ten stock exchanges in the African *continent*. These are Cairo (Egypt), Accra (Ghana), Abidjan (Ivory Coast), Nairobi (Kenya), Casablanca (Morocco), Lagos (Nigeria), Johannesburg (South Africa), Tunis (Tunisia), and Harare (Zimbabwe), and more recently Botswana. Closely related to the paucity of knowledge and apparent lack of interest on capital markets in Africa is a relatively thin base of published literature in this area. One recent paper that focuses on Africa is Ekechi (1989) that examined the weak-form efficiency hypothesis in the context of the Nigerian stock market. Of the ten bourses, only three are active, the rest of the market being characterized by either very thin or no trading. The three active ones are Lagos (Nigeria), Johannesburg (South Africa), and Harare (Zimbabwe). The Botswana "market" commenced trading for the first time in August 1989 in the country's six quoted companies but is equally characterized by thin trading. Thus one can claim, without loss of generality, that these three active markets span the investment opportunity set of a potential investor vis a vis African economies.

The benefits of portfolio diversification are based on the principle that if securities in a portfolio are less than perfectly correlated, adverse movements in the return on any constituent security are somewhat counterbalanced by favorable realization in some of the other securities in the portfolio. Consequently, the impact of the adverse shock on the portfolio is otherwise mitigated. Gruber (1968) explores the capital flows between the US and several European countries based on the diversification motive.

In the same vein, Levy & Sarnat (1970) demonstrate that international diversification of a portfolio of assets yields benefits because of the imperfect correlation that may exist among returns from assets in different countries. Their broad-based survey contained countries from all the continents. However, only the Republic of South Africa was selected from the African continent.

In a more recent study focusing on country funds, Bailey & Lim (1989) emphasize that benefits from diversification into foreign stock markets may be substantially reduced if significant transaction costs exist due to numerous capital controls and other barriers to foreign portfolio investment. In their study of Pacific Rim countries, Bailey & Stulz (1989) argue that even if returns on foreign stock indices have similar first and second moments as the US market indices, the benefits from international diversification can be

maximized if these foreign indices have a very low correlation with the US market indices.

It is, therefore, of concern that with the growing interest in international portfolio diversification has come a parallel growth in global macroeconomic interdependency. The direction of the correlation in macro shocks as well as the transmission mechanisms are issues that deserve serious research.¹

If this growth in world economic integration continues, it may suggest that in the near future, even partial global portfolio diversification may be difficult to achieve. Presently, most of the international economic linkage appear to be occurring within the developed countries and to a limited extent in the economies of some of the emergent nations. It will not be long before the potential diversification benefits from some of the "neglected" third-world economies are explored. These hitherto unexplored alternatives become particularly important with the increased difficulty in achieving global portfolio diversification; global being defined within the context of existing active markets which consist mainly of the bourses of developed countries. In fact Levy & Sarnat (1970) found that "the most striking feature of the composition of the diversified international portfolio[s] is the relatively high proportion of investments in developing or borderline income countries"

The rest of this paper is organized as follows: section 2 provides some institutional background on the Nigeria and South Africa and Zimbabwe stock exchanges; section 3 contains a description of the data; section 4 presents the methodology employed, empirical estimates as well as analysis of the results while section 5 discusses qualifications to the results and directions for further research.

2. Institutional Considerations

2.1 The Lagos Stock Exchange

Established in June 1961 as the Lagos Stock Exchange and renamed the Nigerian Stock Exchange in December 1977, it currently has two regional branches (dealing floors) in Kaduna and Port Harcourt, Nigeria. The dealing members who are called stockbrokers are licensed by the council of the Exchange (the governing body) to trade in stocks and bonds. A regulatory body known as the Securities and Exchange Commission (SEC) established in 1978 supervises the operation of the Exchange and investigates allegations of impropriety including "insider trading."² In particular, the SEC administers

¹ An extant survey is Mossa (1979)

² SEC Decree # 71 (1979).

prices in the primary market (sets the offer price of new issues), regulates the operation of the stock market, as well as the registration of securities.

The market is classified into two categories (tiers) based on listing standards required by the Exchange; listing and reporting requirements in the first tier being more stringent.³ Three broad classes of securities are listed on the exchange - Government Stocks, Industrial Loans, and Equities. Excluding government securities 109 equities are listed in the first tier market and 9 in the Second-tier Securities Market (SSM) as at 15 January 1990.⁴ The main sectoral distribution of the listed companies are Automobile and Tires, Banking, Breweries, Building Materials (Hardware), Chemical and Paints, Commercial, Computer and Office Equipments, Conglomerates, Construction, Soap and Toiletries, Food/Beverages and Tobacco, Footwear, Hotels, Industrial/Domestic Products, Investment Companies, Machinery (Marketing), Packaging, Petroleum (Marketing), Pharmaceutical and Animal Feeds, Publishing, and Textiles. In 1988 the average daily volume of shares traded was 1,027,532; the total number of listed securities, 188 and the number of dealing members 43.⁵

The Nigerian Stock Exchange operates a Call-Over system: once trading commences, the securities are called out by an Officer of the Exchange one after the other, for dealing members to indicate interest by either bidding for, or offering the mentioned security at an asking price.⁶ The system is similar to an auction process with the Officer of the Exchange, the auctioneer. This system which contrasts with the specialist system in U.S. or the jobbing system in UK, is dictated by the relatively small number of securities listed on the exchange. Transfer costs (cost of buying shares on the Exchange) are relatively low and consists of (1) broker's commission, (2) contract stamp, and (3) SEC fee. The SEC provides a scale of commissions applicable to each transaction which stockbrokers are authorized to charge. It is illegal to charge below the authorized amount. The closing price of all listed securities as at the end of each trading day are published in a daily report called The Stock Exchange Daily Official List. Present stock exchange regulations prohibit stockbrokers from transacting in listed securities outside the exchange. Trading

³ The Second-tier Securities Market (SSM) was introduced in April 1985 to provide a public market at reduced compliance cost for the shares of small to medium-sized companies without the need to release more than 10% of the equity capital of the company whilst offering most of the advantages of a stock exchange listing. Securities in the second-tier market are not published in the Daily Official List of the exchange. **Source:** The Nigerian Stock Exchange, *Annual Report*, 1985

⁴ *Business Times* (Nigeria), vol. 15 # 3, Jan. 15, 1990.

⁵ The Nigerian Stock Exchange, *Annual Report*, 1988.

⁶ Alile & Anao (1986).

on the floor is for an hour each day (Monday through Friday). No margin trading is allowed and no options are traded.⁷

The Nigerian Stock Exchange maintains a market price index known as the NSE Common Stocks Index. The Index is designed to measure the extent and direction of the general price movement on the exchange. It is computed as an aggregate of the market capitalization of all industrial equities listed in the market.⁸

2.2 The Johannesburg Stock Exchange

Established in September 1887, the Johannesburg Stock Exchange (JSE) is the sole surviving stock exchange in South Africa. The institution is regulated as per the Stock Exchanges Control Act of 1947 (as amended occasionally) and supervised through a body of rules and regulations enforced by the Johannesburg Stock Exchange Committee.⁹ The total membership as at 28 February 1990 was 392, of which 85 were non-broking.¹⁰ The exchange is open daily Monday to Friday from 9:30am to 1:00pm, and from 2:00pm to 4:00pm. Although new issues are market determined, transaction costs are codified.

Similar to the system in Nigeria, the Johannesburg Stock Exchange operates a two-tier equities market. The second tier was established in 1984 as a development capital market, where small and medium-sized companies could raise capital. Listing requirements on the development capital section (second-tier market) are less stringent. 777 companies representing 1773 securities were listed on the main section while 48 companies were listed on the development capital market at the end of March 1990.¹¹ As June 1985, the total volume of shares traded was 583 million or a daily average volume of 3.24 million shares.¹²

⁷ *ibid*, p. 69.

⁸ The formula is: (Current Market Value / Base Market Value) * 100

$$= \frac{\sum_{i=1}^n P_{ai} Q_{ai}}{\sum_{i=1}^n P_{bi} Q_{bi}} \quad \text{Where } P_{ai} \text{ is the current market price of an ordinary share in company } i, \text{ and } Q_{ai}$$

is the current number of listed ordinary shares of company i , P_{bi} and Q_{bi} represent the market price of an ordinary share and the number of Q . represent shares, respectively, of company i at the base date (3 January 1984); n = number of constituent securities.

⁹ Price Waterhouse (1983).

¹⁰ JSE *Annual Report* (1990).

¹¹ *Ibid*.

¹² Les de Villiers, Marais & Wiehahn (1986).

International transfer of funds in or out of South Africa require prior exchange control approval from the South African Reserve Bank. Two types of exchange rates exist: Commercial Rand and Financial Rand. The latter is traded at a more favorable rate (sold and purchased at a rate substantially lower *than that* of the Commercial Rand) to foreign investors and are thus often used by foreign investors in transactions with South Africa. In 1983, exchange control over non-residents was abolished. Non-residents were allowed to freely repatriate proceeds from investments. Consequently, the Financial Rand was discontinued in February 1983. It was, however, reintroduced on 2 September 1985. From September 1985 purchases of shares by non-residents were strictly in terms of Financial Rand but the proceeds from the local resale of such shares held by *non residents* cannot be repatriated in foreign currency. Instead it has to be retained with authorized foreign exchange dealers in South Africa in the form of Financial Rand balances. These balances are, however, freely transferable between non-residents and can be reinvested in securities quoted in South Africa.

2.3 The Zimbabwe Stock Exchange

Established in 1894, the Zimbabwe stock exchange is located in Harare. Its operation is governed by the Zimbabwe Stock Exchange Act. Approximately 76 South African companies were quoted on the exchange. Shares were held by nominee companies for stockholders. However, in March, 1984 the Government took control of these pool of shares and compensated the stockholders in local currency (Zim dollar equivalent). From 1984, only local companies are now listed. As at first quarter 1990 there were 54 stocks listed on the exchange and two dealers that make a market in the shares. For the operating year ended 31 March 1990 the volume of shares traded was 44,559,000 shares, down from 52 million shares for the year ended 31 March 1988. Transaction fees are regulated by the government but the price of new issues are market-determined. The trading floor is open daily Monday to Friday from 8:00am to 12:00 noon and the business office of the exchange remains open until 4:30pm. The exchange maintains two official stock indices, the Mining Index and the Industrial Index (1967=100).

3. Data and Unit Root Tests

The data set consists of daily observations on the series for the period beginning June 15, 1987 to October 31, 1989 inclusive. The series consist of the Nigerian Stock Exchange (NSE) Common Stocks Index, the official Nigerian Naira exchange rate per unit of U.S. dollar; the Johannesburg Overall Index, the official South Africa Commercial Rand exchange rate per unit of U.S. dollar; the RBZ Industrial Index for Zimbabwe, the Reserve Bank quoted rates from Zimbabwe Banking Corporation Limited (a registered commercial bank); and the New York Composite Stock index. Data pertaining to Nigeria

was obtained from Central Bank of Nigeria and the Nigerian Stock Exchange and data on Zimbabwe stock were obtained from the Zimbabwe Stock Exchange. The South African Mission to the IMF & World Bank has generously made available to us the data on South Africa. We are indebted to Warren Bailey for the New York Composite Stock index.¹³

In order to avoid synchronous problems, the calendar times over which the returns are measured were carefully and exactly matched. It is worth *noting that* the treatment of synchronous trading has not been uniform in the literature. In particular, matching of calendar times are more difficult to achieve when the markets are located in different time zones and observe different holidays.

Before applying the proposed empirical analysis to the data we test for unit root in these series partly to gain more knowledge of the statistical properties of the data that consist the instrument of our study. Considerable evidence is presented in recent literature indicating that many economic time series are nonstationary in level. Certain interest rate series also fall in this category [See, e.g., Nelson & Plosser (1982), and Wasserfallen (1986)]. Although practitioners often difference the data arbitrarily in the hope of achieving stationarity, such practice is criticized by econometricians. It is even suggested that arbitrary differencing may cause problems more serious than inappropriately assuming stationarity [Hendry & Mizon (1978)]. Therefore, it merits to test the first difference hypothesis and only difference the data if one fails to reject this hypothesis.

For the unit root test, we employ the likelihood ratio test proposed by Dickey and Fuller (1981). The test statistic may be computed using either of the following regression equations:

$$Y_t = a + bt + cY_{t-1} + e_t \quad (1)$$

$$Y_t = a + bt + cY_{t-1} + \sum_{i=1}^k d_i DY_{t-i} + e_t \quad (2)$$

Where t is time, Y_t is the realization of the series at time t , Δ is the differencing operator, k is a constant usually chosen to be between 1 and 4, and e 's are error terms. The unit root

¹³ Although the Financial Rand is the most relevant foreign exchange series for evaluating investment in the Republic of South Africa, complete data on the series are unavailable for the period January 1987 to April 1988 from the South African Commercial Bank as well as from other possible sources in South Africa

hypothesis asserts the restriction (a, b, c)=(a,0,1). The relevant statistic is Dickey and Fuller's t. statistic which is computed as a standard F test of this restriction. The critical values are obtained from Dickey and Fuller's Table VI. The critical value for a 5%(10%) level test is 6.34(5.39). Clearly, all statistics (Table 1, below) are significant at both levels, so we fail to reject the hypothesis of unit root.

Table 1
Unit Root Test Results

Country	Equation 1		Equation 2	
	F ₃ : SI	F ₃ :XR	F ₃ : SI	F ₃ : XR
Nigeria	0.9094	1.7097	0.8533	1.6266
South Africa	1.6506	6.2460	1.4425	1.6853
U.S.A	2.1906	NA	2.0501	NA
Zimbabwe	1.8036	2.5429	1.0682	2.4722

The reported statistic is Dickey & Fuller's ⁰³ Each of the statistic is obtained from independently estimating equations 1 and 2. XR refers to exchange rate series and SI refers to stock index series. NA means "not applicable." * denotes significance at 10% level

4. Empirical Estimates and Methodology

4.1 Empirical Methodology

To explore the potential benefits to a U.S. investor from diversifying into sub-Saharan economies, we follow the standard procedure exposted in Levy & Sarnat (1970) . The problem may be stated as that of a representative U.S. investor that needs to determine the composition of his/her optimal international portfolio, international in this context referring to positions in Africa and the U.S.A. Let us define x. as the proportion of the agents wealth invested in country i for the period under consideration. Formally, the agent needs to find $X^{*'}1 = (x^{*'}1, \dots, x^{*'})$ such that there exists no other portfolio with either (i) a higher return and a lower risk (ii) a higher return at the same level of risk, and (iii) same level of return at a lower risk. That is, X, solves the following quadratic programming problem:

$$\min_x V = X' \hat{A} X \quad (3)$$

subject to (1) $X'1=1$, and (2) $X'R = e$, where V = the variance of the investor's portfolio, $\hat{A}$ the correlation matrix of the daily returns of the portfolio, R = the expected return on

the portfolio, and e = the minimum acceptable return on the portfolio to the investor. a thus represents the reservation return for the investor below which she is unwilling to hold the portfolio. S is verified positive definite. Because the restrictions are all linear, the Kuhn-Tucker constraint qualifications are satisfied. By varying e -values we generate portfolio-efficient frontiers. These frontiers and the investment proportions implied by different segments thereof constitute the basis for our subsequent analysis.

4.2 Empirical Estimates

We proxy the daily expected return of a constituent security in the portfolio r_{it} by the ex-post return, $\frac{p_{it} - p_{it-1}}{p_{it-1}}$, where p_{it} is the closing price of country i 's stock index at time, t . The returns on the foreign indexes have been converted to dollar at the respective exchange rates ruling at time $t=1, \dots, T$. The mean daily return on country i index is given by $u_i = \frac{1}{T} \sum_{t=1}^T r_{it}$. It follows for our problem that $R' = (u_1, u_2, u_3, u_4)$. The figures (annualized) for the mean daily returns and the standard deviation of the daily returns (S_i) are presented in table 2.

For investments in these African economies, the hedging of exchange rate risk is a possibility for a U.S. investor although prevailing exchange control regulations and banking practices in these countries may currently preclude this strategy. Therefore, the possibility of exchange risk influencing the results reported below is explored by showing returns on a local as well as exchange rate-adjusted basis. It must be noted that the relevant exchange rate for South Africa is the Financial Rand and that since this rate is more favorable to investors, the exchange-rate adjusted return as reported here may underestimate the relevant return from investment in South Africa.

Table 3 is the correlation matrix (S) of the exchange rate-adjusted daily returns. The correlation (p-values) of the daily returns are reported for the lagged and unlagged values. We lag daily returns to explore the effect on our estimates of the differences in times on the continents during which the bourses are open for business (synchronous trading). US returns are lagged since the continent of America is west of the international date line. In table 4 we report similar estimates for local daily returns.

To explore potential gains from diversification as well as optimal investment strategies we need to construct the set of portfolio-efficient frontier.¹⁴ The optimal vector of portfolio weights implied by the different segments of the frontiers enable us discuss

¹⁴ The routines used are the QPROG and BLINF, available in the IMSL Math/Library.

efficient investment strategies in the next section of the paper. These frontiers are displayed in figures 1, 2 and 3 beginning on page 10. Figure 1 which explores the effect of synchronous trading on portfolio efficient frontiers demonstrate that the benefits from diversification may be understated if differences in trading times between markets are ignored. Figures 2 and 3 represent the empirical estimates of the portfolio-efficient frontiers for a U.S. investor based on- seven investment strategy combinations, namely; (1) diversification into all four countries (denoted as Allgd in the figures) (2) diversification into US and Nigeria (un) (3) US/South Africa (us) (4) US/Zimbabwe (uz) (5) US/Nigeria/South Africa (uns) (6) US/Nigeria/Zimbabwe (zun) and (7) US/South Africa/Zimbabwe (zus).

4.3 Empirical Analysis

Based on our estimates (see figures 1, 2 and 3), the most inefficient investment strategies are un, uns, and us. Among this set, investing in Nigeria (un) is the least desirable. Investing in all four countries is the dominant strategy. It unambiguously dominates a no-diversification strategy (100% investment in the USA). The ranking of the investment strategies is based on the relative marginal rates of transformation between risk and return implicit in the different frontiers. Based on this criteria the ranking of the investment strategy combinations are in order of preference (1) investing in all four countries (2) Zimbabwe/US/South Africa (3) Zimbabwe/US/Nigeria (4) US/Zimbabwe (5) US/South Africa tying with US/Nigeria/South Africa and (6) the least preferred, US/Nigeria. Along the best frontier (Allgd), the representative investor's minimum variance portfolio (MVP) is a fully diversified one implying strictly positive portfolio weights in each country.¹⁵ Along the frontier, Allgd, segments beyond the risk/return coordinate (0.683, 0.385) involve short positions in South Africa while combinations beyond (0.969, 0.526) involve short positions in Nigeria. All points on the frontier Allgd involve positive portfolio weights in both Zimbabwe and the United States.

¹⁵ Optimal vector of portfolio weights, $(X^*)' = (0.281, 0.216, 0.214, 0.286)$ for Nigeria, South Africa, USA, and Zimbabwe respectively. The minimum variance portfolio is the efficient portfolio combination which has the least possible variance. For the best frontier, Allgd, MVP risk/return coordinate is $(0.506, 0.210)$

Table 2
Risk/Return Estimates of the Stock Indices

Country	Mean		Std. Deviation	
	xu ^c	lu ^d	xs ^e	ls ^f
Nigeria	0.0642	0.5622	7.5568	4.7340
South Africa	0.0326	0.2114	8.7664	6.4354
U.S.A	0.1605	0.1605	6.1430	6.1430
Zimbabwe	0.5243	0.7604	2.9893	2.4260

The reported figures are the mean daily returns as well as the standard deviations of the daily returns of the stock indices of the respective countries, annualized. The figures have been annualized on a bond-equivalent yield basis by using a 360-day count for a year. Local as well as exchange rate-adjusted returns are also tabulated in table 2. c = mean of exchange rate-adjusted daily returns, d = mean of local daily returns, e = standard deviation of exchange rate-adjusted daily returns, f = standard deviation of local daily returns.

Table 3
Correlation Matrix:
Exchange Rate-Adjusted returns

Country	Nigeria		S. Africa		U.S.A		Zimbabwe	
	Igd	Unlgd	lgd	Unlgd	lgd	Unlgd	Lgd	Unlgd
Nigeria	1.0000	1.0000						
S. Africa	-0.0380	-0.0380	1.0000	1.0000				
U.S.A.	0.0029	-0.0320	-0.0981	1.0000	1.0000			
Zimbabwe	-0.0680	-0.0680	-0.0062	-0.0061	-0.0386	0.0420	1.0000	1.0000

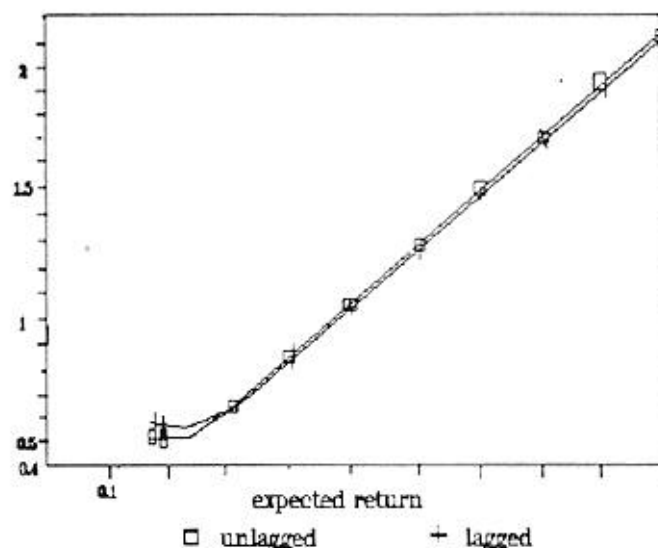
The reported statistics are the p-values of the daily returns of the stock indices of the respective countries. The correlation coefficients for the lagged (Lgd) and unlagged (unlgd) daily returns are reported next to each other.

Table 4
Correlation Matrix of Local Returns

Country	Nigeria		S. Africa		U.S.A.		Zimbabwe	
	lgd	Unlgd	Lgd	Unlgd	lgd	Unlgd	Lgd	Unlgd
Nigeria	1.0000	1.0000						
S. Africa	0.1037	0.1037	1.0000	1.0000				
U.S.A.	0.0011	0.0019	0.3390	-0.0841	1.0000	1.0000		
Zimbabwe	0.0558	0.0558	0.0878	0.0878	-0.0339	0.0881	1.0000	1.0000

The reported statistics are the p-values of the daily returns of the stock indices of the respective countries. The correlation coefficients for the lagged (Lgd) and unlagged (Unlgd) daily returns are reported next to each other.

Figure 1
Portfolio-Efficient Frontiers: US Returns Lagged/Unlagged



It now remains to establish the equilibrium portfolio for our representative investor. For this we exploit the ideas exposited in Sharpe (1964) and Lintner (1965). The existence in the USA of a riskless asset with a positive yield enables us to construct a market opportunity line for our representative investor.¹⁶ It turns out that portfolio equilibrium (established at the point where the market opportunity line is tangent to the portfolio-efficient frontier) involves capital inflow into these African economies; an outcome that is not only unambiguously conducive to African economic growth but also rests direct responsibility for inducing indirect capital inflow on the policy makers of these countries.

Since our studies are based on the market indices, it needs to be emphasized that index-linked investments are not yet available in any of the African economies. Admittedly, investors are concerned with the performance of individual stocks as well as the entire market; therefore, we must caution that our estimates, based as it is on market indices which cannot be presently exploited by investors, provide only a guide to the attractiveness of these markets. The existence of efficient frontiers is of course not a sufficient condition for portfolio investment. Regulatory and tax considerations also constitute critical decision parameters. For instance, foreign investors are concerned with the legal ability to enforce contractual claims such as voting rights, dividend remittance, stock transfers etc. The role of exchange control policies cannot be overemphasized. It is well known that institutional investors such as mutual funds, life insurance companies

¹⁶ We employ the yield on the 30 year "bell weather" Treasury bond as our representative riskless asset.

and pension funds are major players in equity markets. But so far, mutual funds seem to be the only institution leading the initiative in terms of portfolio diversification into emerging capital markets. Unfortunately, contractual savings institutions shun mutual funds as a vehicle of foreign portfolio investment, preferring direct management to which they are accustomed.

Figure 2
Portfolio-Efficient Frontiers: US/Zimbabwe/South Africa
Investment Strategy Combination Excluded

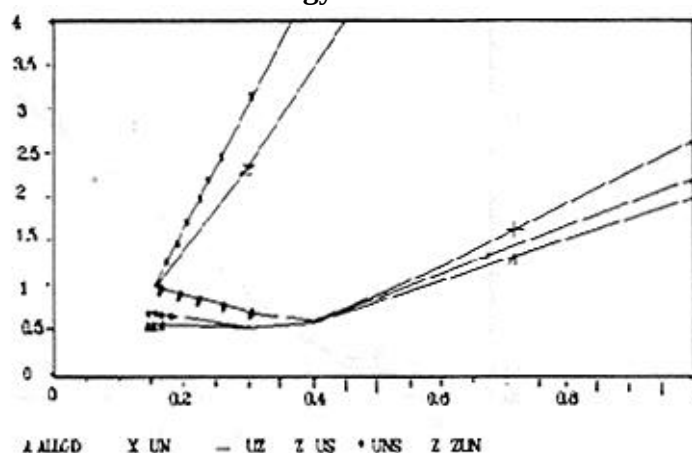
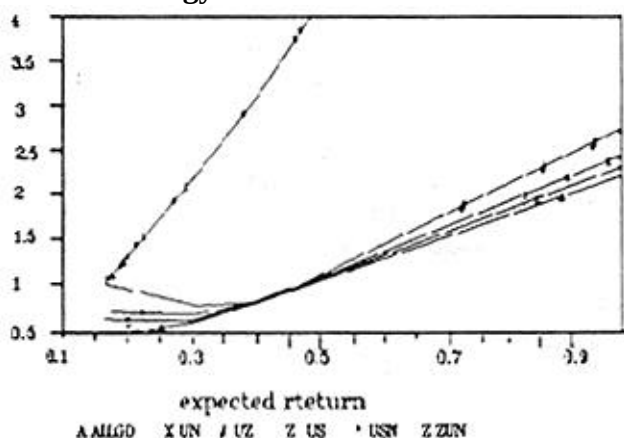


Figure 3
Portfolio-Efficient Frontiers: US-Nigeria Investment
Strategy Combination Excluded



The absence of these heavy players is due to the severe international restriction on portfolio investments that characterize developing countries. Potential capital inflows to developing countries from mutual funds and/or individual investors is simply inadequate. Dailami & Atkin (1990) report that of approximately \$17 billion in emerging capital

markets held by nonresidents, the assets of known country funds (mutual funds that specialize in equities of developing countries) amount to about \$11 billion. But the total assets of institutional investors in the major markets of Europe, Japan, and the United States are estimated at \$7.5 trillion with annual growth at about 15%. This implies that the value of portfolio investments by institutional investors in the emerging markets account for a mere 0.147% of their total position in Europe, Japan and the US. Obviously there exists a vast potential of capital funds for the emerging economies to tap.

One more issue that merits attention is the concern expressed in Nigeria on the lack of interest by local residents in the equities market.¹⁷ This is regrettable given the relatively high level of return on equities available to local residents. This economic inefficiency is most probably rooted in poor information on available investment opportunities and their relative yields plus a prevalent high proportion of illiterate surplus-saving units.¹⁸ we have received arguments that the high returns is rooted in the fact that shares are bottled up (i.e., not traded).¹⁹ But this fails to explain why the Nigerian Stock Exchange is advertising to attract more equity market participants to the extent of opening remote dealing floors in the regions. However, the "bottling up" explanation is consistent with the existence of thin markets in Nigeria and Zimbabwe, both of whose local return on equities are relatively high.

5. Conclusions

Potentially mutual benefits accrue from portfolio diversification by US investors into African economies. For the investor, Africa offers an opportunity to select a portfolio with a superior risk/return characteristics; a goal that has become more difficult to achieve as economies of the world grow increasingly integrated. For the African nations, it provides much needed infusion of long term capital that is conducive to regional economic growth. While responsibility to provide attractive investment climates rests with the policy makers in these developing economies, suggestions for optimal economic policies that include the "right kind" of incentives continue to provide "cottage industry" to researchers in the field of economic development. As usual, the need to implement policies that attract foreign capital requires finesse so as to strike an optimal balance with the peculiar needs of these nascent economies. While such issue is beyond the scope of this paper, a few remarks on some of the current policies in these countries are in order.

¹⁷ See, for instance, Alile & Anao (1986), p. 129, and the Nigerian Stock Exchange Annual Report (1988), p. 6.

¹⁸ Market research undertaken in 1990 by the Johannesburg Stock Exchange (JSE) reveals a lack of knowledge by private individuals in South Africa on the mechanics and merits of equity investment. Consequently, the JSE is giving consideration to a communications and marketing program. Source : « Executive Report », JSE *Annual Report* (1990).

¹⁹ We are indebted to Professor Willi Iyiegbuniwe of the University of Lagos, Nigeria, for this view.

The economy of Nigeria is heavily dependent on oil exports (OPEC-member nation) and for the period covered in the study, has been going through transitional changes politically as well as economically. The nature of the transition involved in the economic sector is relatively more drastic and involves, among other things, changes in its foreign exchange control regime as well as IMF-mandated structural adjustment programs.

South Africa on the other hand, has witnessed economic backlash in response to its political system, and is also going through transitional phases. Like Nigeria, South Africa is heavily dependent on natural resources. Both of these countries have embarked on programs designed to improve their economies and thus render them attractive to international investors. A lot, however, remains to be accomplished in terms of reforms. It is noteworthy that the empirical estimates of the risk/return profile for the equities market in South Africa lend qualified support to the contention in some literature on "Apartheid and Divestiture" that the recent wave of divestment may have had more to do with a deteriorating economy than a statement of opposition to Apartheid policy:

With few exceptions, the sixties and seventies were high yield years for foreign investors in South Africa. Hence the failure on the part of the disinvestment forces to make much headway in these years In 1983, however, conditions changed. A worldwide recession led to a sharp economic downturn ... one of the world's high return low risk business areas was perceived in 1985 as a low return high risk business environment

In 1985 thirteen U.S. firms and a couple of British firms announced their partial or total withdrawal from South Africa. Although economic considerations were apparently the overriding consideration in most [of] these cases, the protagonists of sanctions claimed that politics played a role.

Some of these departing firms have indeed found it convenient to underplay the bad business aspect and stress political purity as the major reason for their withdrawal.²⁰

Although this study lends empirical support to some of the ideas espoused above, it cannot be denied that some corporations divested in response to either political and/or moral pressures or to self-perceived righteous indignation. The importance of such

²⁰ Les de Villiers, *et.al.* (1986).

moral-based divestitures cannot be ignored if they affected the subsequent performance of the South African economy negatively and thereby induced other corporations to divest, even if admittedly for reasons other than political and/or moralistic. The bright side is that if the present poor performance of the economy is due to political rather than economic fundamentals (like business cycles), then there is much that can be done by the people of South Africa to improve the situation and thus attract foreign direct as well as portfolio investments.

Nigerians on the other hand appear to maintain an ambivalent posture in that they constantly reiterate the need to attract foreign capital but leave in place policies and institutional structures that militate against the professed objectives. A prime example is the existing restrictions on international access to its capital markets.²¹

Zimbabwe is a country richly endowed in natural resources with a well-developed physical and social infrastructure, a relatively high degree of industrialization and multi-racially integrated society. The economy was highly regulated during the period leading to independence in 1980. Since the attainment of independence, economic policies were designed both to counter imbalances inherited from the past as well as to maintain a healthy economy. To promote investment, the Government is committed to honor the remittance of pensions and dividends. To further assure investors of protection of their investments the Government in 1990 was applied for membership of Multi-lateral Investment Guarantee Agency and embarked on arrangements which will provide for international arbitration in case of disputes. The Government accedes to the 1965 Convention on the Settlement of Investment Disputes between states and nationals of other countries and to the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards. There are also provisions in the Zimbabwe Constitution *which protect* investment. Presently there exists a regime of exchange controls *which within* prescribed limits, enable foreign investors to remit dividends and profits and the proceeds of disinvestment.

Relaxing access to local capital markets will undoubtedly allow the economy of African nations to benefit from diversity of business culture that such practice fosters. One would have strong reasons to believe that relaxing international access to third-world capital markets would in addition to raising the supply of capital also, in general, promote competitive regulation which are beneficial to local enterprises. That this does not

²¹ See, for instance, Tony Hawkins, « Africa May Come Second, » *Financial Times* (London), 19 March 1990, p. IV, col. 5.

currently obtain in all the emerging economies can only be attributed to entrenched politically powerful groups with vested economic interests in the *status quo*..

An immediate extension of this paper is to incorporate certain institutional realities, namely, analyzing the effect on the portfolio efficient frontier as well as the portfolio equilibrium of not allowing the short selling of stocks. This merits attention inasmuch as the prohibition of speculative trading may sometimes discourage high risk venture capital. Our future research agenda, subject to data availability, is to explore the robustness of potential benefits to diversification into African economies in the presence of other competing economies outside the continent of Africa. In particular, we plan to focus on the economies of France, Germany, Japan, United Kingdom, Italy, Australia, Singapore and Hong Kong.

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