5 The Risk and Expected Returns of African Equity Investment

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OVERVIEW OF AFRICAN ECONOMIES AND STOCK MARKETS

Table 5.1 shows that historically, countries in Africa have lagged the economic performance of the rest of the world. Real gross domestic product growth averaged 2.2 per cent from 1978 to 1985, and 2 per cent from 1986 to 1993. This is slightly lower than the growth rates experienced in the developed world, and much lower than the rate of growth in Asia. Africa, and Sub-Saharan Africa in particular, has also carried relatively high debt loads. Africa represents about 8 per cent of developing world gross domestic product, and 15 per cent of developing world total debt. The numbers for Sub-Saharan Africa are 3.4 per cent and 8.6 per cent respectively. Generally, low levels of economic growth and high debt levels have not been associated with thriving equity markets.

Table 5.2 supports this conclusion. Of over fifty world equity markets, tracked by the International Finance Corporation (IFC) of the World Bank in 1966 only three of them were in Africa.[1] These three national equity markets are small (less than 2 per cent of IFC Composite market capitalization) and very illiquid (two of these countries have daily turnover of less than $15 million).

MEASURES OF COUNTRY RISK IN DEVELOPED COUNTRIES

Asset pricing theory and country risk

There are remarkably diverse ways to calculate country risk and expected returns. The risk that we will concentrate on is risk that is 'systematic'. That is, risk that is not diversifiable. Importantly, systematic risk will be rewarded by investors. That is, higher systematic risk should be linked to higher expected returns.

Table 5.1 Developing countries: World economic activity

Region	*Real GDP: Average Annual Growth (%)* 1978–1985A	1986–1993A	1994–1997A	*Per cent of:* Total GDP World	Total GDP Developing	Total Exports World	Total Exports Developing	Total Debt Developing
Industrial	2.6	2.5	2.8	58.8	–	73.0	–	–
Developing	4.3	5.3	6.3	41.2	100.0	27.0	100.0	100.0
Africa	2.2	2.0	3.6	3.2	7.8	1.7	6.3	15.1
Sub-Saharan Africa				1.4	3.4	0.6	2.2	8.6
Asia	6.5	7.6	8.4	24.4	9.2	17.7	65.6	35.5
Middle East and Europe	2.2	3.5	3.4	4.8	11.7	3.6	13.3	16.1
Western Hemisphere	3.0	2.5	3.7	8.8	21.4	3.9	14.4	33.2

Source: World Economic Outlook, International Monetary Fund, May 1996.
Projections are Medium-Term Baseline Scenario
GDP based on purchasing power parity (PPP) valuation of country GDPs.

Table 5.2 Summary statistics: International Finance Corporation global indices

	Country	Price Earnings Ratio	Price Book Ratio	Dividend Yield	Number of Companies	Market Capitalization US$ (Millions)	Mkt Cap % of Composite	Daily Value Traded US$ (Millions)	Percent of IFCG Composite
	Composite	20.1	1.9	2.0	1683	1 202 760		68 099	
	Asia	22.2	2.6	1.4	936	758 603	63.1	43 220	63.5
	Latin America	19.1	1.0	2.7	330	272 319	22.6	10 823	15.9
	Europe/Mid East	13.1	2.3	3.4	296	68 340	5.7	1 797	2.6
	Africa	18.8	2.7	2.4	121	103 498	8.6	1 218	1.8
	Asia								
A	China	26.7	3.0	1.5	172	46 186	3.8	11 041	16.2
A	India	16.1	2.7	1.6	131	79 987	6.7	2 952	4.3
A	Indonesia	22.5	3.1	1.2	45	55 767	4.6	1 204	1.8
A	Korea	15.0	1.1	1.9	151	110 558	9.2	4 722	6.9
A	Malaysia	27.1	3.8	1.2	123	165 530	13.8	3 112	4.6
A	Pakistan	17.6	1.9	2.0	68	7 153	0.6	653	1.0
A	Philippines	32.0	3.7	0.6	46	46 420	3.9	1 067	1.6
A	Sri Lanka	7.2	1.2	3.4	44	1 071	0.1	6	0.0
A	Taiwan	26.9	3.5	1.0	83	154 781	12.9	28 182	41.4
A	Thailand	20.5	2.9	2.2	73	91 149	7.6	1 321	1.9
	Latin America								
L	Argentina	19.7	1.5	2.6	35	25 647	2.1	266	0.4
L	Brazil	55.9	0.6	3.2	86	113 553	9.4	7 082	10.4
L	Chile	16.3	2.1	3.8	47	43 085	3.6	560	0.8
L	Colombia	9.9	0.9	3.0	28	6 875	0.6	N/A	N/A
L	Mexico	10.5	1.7	1.2	81	70 922	5.9	2 656	3.9
L	Peru	15.1	3.0	1.4	37	8 423	0.7	218	0.3
L	Venezuela	20.6	2.3	2.7	16	3 814	0.3	41	0.1

Table 5.2 (*continued*)

	Country	Price Earnings Ratio	Price Book Ratio	Dividend Yield	Number of Companies	Market Capitalization US$ (Millions)	Mkt Cap % of Composite	Daily Value Traded US$ (Millions)	Percent of IFCG Composite
	Europe/Middle East								
E	Czech Republic	14.4	1.1	1.4	69	13 541	1.1	43	0.1
E	Greece	9.4	1.8	5.1	53	10 416	0.9	238	0.3
E	Hungary	27.3	1.5	1.1	16	3 592	0.3	69	0.1
E	Jordan	13.4	1.5	3.5	51	3 029	0.3	14	0.0
E	Poland	11.4	2.4	1.0	23	4 935	0.4	N/A	N/A
E	Portugal	15.9	1.6	2.9	30	13 045	1.1	361	0.5
E	Turkey	10.0	4.1	5.4	54	19 783	1.6	1 072	1.6
	Africa								
F	Nigeria	10.6	2.6	4.8	35	2 090	0.2	4	0.0
F	South Africa	19.1	2.7	2.3	63	99 577	8.3	1 201	1.8
F	Zimbabwe	9.4	1.6	4.6	23	1 831	0.2	14	0.0

Date: 30 June 1966

A simple, and well-known, approach to systematic risk is the beta of the Sharpe (1964), Lintner (1965), and Black (1972) capital asset pricing model (CAPM). This model was initially presented and applied to US data. The classic empirical studies, such as Fama and MacBeth (1973), Gibbons (1982), and Stambaugh (1982) present some evidence in support of the formulation. The model is used in an international setting by Solnik (1974a, 1974b, 1977). In these applications, the risk factor is no longer the US market portfolio but the world market portfolio.

Evidence on using the beta factor as a country risk measure in an international context is mixed. The early studies find it difficult to reject a model that relates average beta risk to average returns. For example, Harvey and Zhou (1993) find it difficult to reject a positive relation between beta risk and expected returns in 18 developed markets. When more general models are examined, however, the evidence against the model becomes stronger.

Harvey (1991) presents evidence against the world CAPM when both risks and expected returns are allowed to change through time. Ferson and Harvey (1993) extend this analysis to a multifactor formulation that follows the work of Ross (1976) and Sharpe (1982). Ferson and Harvey's model also allows for dynamic risk premiums and risk exposures.

The bottom line for these studies is that the beta approach has some merit when applied in developed countries. Beta, whether measured against a single factor or against multiple world sources of risk, appears to have some ability to discriminate between expected returns. The work of Ferson and Harvey (1994, 1996) is directed at modelling the conditional risk functions for developed capital markets. They show how to introduce economic variables, fundamental measures, and both local and worldwide information into dynamic risk functions.

This work, however, applies only to developed markets. What about the rest of the world, and in particular, Africa?

Country risk in developing markets

One might consider measuring systematic risk the same way in emerging as well as developed markets. Harvey's (1995) study of emerging market returns suggests that there is no relation between expected returns and betas measured with respect to the world market portfolio. A regression of average returns on average betas produces an R-squared of zero. Harvey documents that the country variance does a better job of explaining the cross-sectional variation in expected returns.

Bekaert and Harvey (1995a, 1996a, 1997) pursue a model where expected returns are influenced by both world factors (like a world CAPM) and local factors (like a CAPM that holds only in that country). They propose a conditional regime-switching methodology that allows the country to evolve from a developing segmented country to a developing country that is integrated in world capital markets.

The Bekaert and Harvey work is very promising, and the authors have applied this idea to the cost of capital estimation for individual securities in emerging markets (see Bekaert and Harvey (1995b)). All the estimation is calibrated using the data for only the 20 developing countries collected by the International Finance Corporation, however.

It is straightforward to estimate a relation (the 'reward for risk') between, say, a beta and expected return. The cost of capital is obtained by multiplying this reward for risk times the beta. The beta is measured by analysing the way the equity returns covary with a benchmark return.

What if there is no equity market? That is, even if we estimate the risk premium using the countries where data are available, we have no way of using the reward for risk, because we do not have betas for many of the developing economies' markets – because the equity markets do not yet exist.

Alternative risk measures

We start our exercise with the requirement that the candidate risk measure must be available for all countries, and it must be available in a timely fashion. This eliminates risk measures based solely on the equity market. It also eliminates measures based on macroeconomic data that are subject to irregular releases and often dramatic revisions. We focus on country risk rating. The country risk ratings source used in this chapter is Political Risk Services' *International Country Risk Guide*.

There are many services that measure country risk. Information on the following providers is found in Erb *et al.* (1996b):

Bank of America World Information Services
Business Environment Risk Intelligence (BERI) S.A.
Control Risks Information Services (CRIS)
Economist Intelligence Unit (EIU)
Euromoney
Institutional Investor
Standard and Poor's Rating Group
Political Risk Services: International Country Risk Guide (ICRG)
Political Risk Services: Coplin–O'Leary Rating System
Moody's Investor Services

Each of the index or rating providers must amalgamate a range of qualitative and quantitative information into a single index or rating. In this section, we review in detail the methodologies used by two of the foremost providers of risk ratings: *Institutional Investor* and *International Country Risk Guide* (ICRG).

Table 5.3 Critical factors in *Institutional Investor's* country credit ratings

	OECD		*Emerging*		*Rest of World*	
	1979	1994	1979	1994	1979	1994
Economic Outlook	1	1	2	3	3	4
Debt Service	5	2	1	1	1	1
Financial Reserves/ Current Account	2	3	4	4	4	3
Fiscal Policy	9	4	9	7	6	6
Political Outlook	3	5	3	2	2	2
Access to Capital Markets	6	6	7	9	8	9
Trade Balance	4	7	5	5	5	5
Inflow of Portfolio Investments	7	8	8	8	7	8
Foreign Direct Investments	8	9	6	5	9	7

Institutional Investor

Institutional Investor credit ratings are based on a survey of leading international bankers who are asked to rate each country on a scale from zero to 100 (where 100 represents maximum creditworthiness). *Institutional Investor* averages these ratings, providing greater weights to respondents with greater worldwide exposure and more sophisticated country analysis systems.[2]

Whenever a survey or expert panel is used to subjectively rate creditworthiness, it is hard to exactly define the parameters taken into account. At any given point in time an expert's recommendation will be based upon factors the expert feels are relevant.

In order to identify the factors that its survey participants have taken into consideration in the past, *Institutional Investor* asks them to rank the factors that they take into account in preparing country ratings. The results of this survey are listed in Table 5.3. Note that the bankers rank factors differently for different groups of countries and that rankings have changed over time within country groups. The ranking of factors affecting OECD country ratings appear to have been the most turbulent over the 15-year period.

International Country Risk Guide

ICRG compiles monthly data on a variety of political, financial and economic risk factors to calculate risk indices in each of these categories as well as a composite risk index. Five financial, thirteen political and six economic factors

are used. Each factor is assigned a numerical rating within a specified range. The specified allowable range for each factor reflects the weight attributed to that factor. A higher score indicates lesser risk.[3]

Political risk assessment scores are based on subjective staff analysis of available information. Economic risk assessment scores are based upon objective analysis of quantitative data and financial risk assessment scores are based upon analysis of a mix of quantitative and qualitative information.

Calculation of the three individual indices is simply a matter of summing up the point scores for each factor within each risk category. The composite rating is a linear combination of the three individual indices' point scores. Note that the political risk measure (100 points) is given twice the weight of financial and economic risk (50 points each). ICRG, as well as many of the other providers, think of country risk as being composed of two primary components: ability to pay and willingness to pay. Political risk is associated with a willingness to pay while financial and economic risk are associated with an ability to pay.

The specific formulas for these calculations are as follows:

$$PR = \sum PR_i, \quad ER = \sum ER_i, \quad FR = \sum FR_i$$

$$\text{and} \quad CRR = 0.5^*(ER + FR) + 0.5^*PR$$

where PR is political risk, ER is economic risk, FR is financial risk and CRR is the composite risk rating. The specific factors taken into account for each risk index are detailed in Table 5.4.

Index and rating provider comparison

A wide range of groups provide country risk or country credit ratings. Although the factors taken into account by each group and the audience they seek to inform vary, there are significant similarities across the providers of these measures.

Most of the providers transform widely used quantitative economic indicators in roughly the same manner. The important differences are found in the degree of and specific factors included in the qualitative component of the risk index measures. Tables 5.5 and 5.6 contrast the primary risk index products available from the indicated groups.

Table 5.5 identifies the underlying analytical source (ie, quantitative or qualitative information) for each major index subcomponent. Additionally, the index measure is categorized as ordinal or scalar and the data sources are classified. From this table it can be seen that most firms use a mix of qualitative and quantitative analysis. The extremes are represented by Bank of America World Information Services which is wholly based on quantitative information, and *Institutional Investor* which is wholly based on a survey of

Table 5.4 Critical factors in ICRG rating system

	Points	*% of Individual Index*	*% of Composite*
Political			
Economic expectations versus reality	12	12	6
Economic planning failures	12	12	6
Political leadership	12	12	6
External conflict	10	10	5
Corruption in government	6	6	3
Military in politics	6	6	3
Organized religion in politics	6	6	3
Law and order tradition	6	6	3
Racial and nationality tensions	6	6	3
Political terrorism	6	6	3
Civil war	6	6	3
Political party development	6	6	3
Quality of bureaucracy	6	6	3
Total Political Points	100	100	50
Financial			
Loan default or unfavourable loan restructuring	10	10	5
Delayed payment of suppliers' credits	10	10	5
Repudiation of contracts by government	10	10	5
Losses from exchange controls	10	10	5
Expropriation of private investments	10	10	5
Total Financial Points	50	100	25
Economic			
Inflation	10	10	5
Debt service as a % of exports of goods and services	10	10	5
International liquidity ratios	5	5	3
Foreign trade collection experience	5	5	3
Current account balance as % of goods and services	15	15	8
Parallel foreign exchange rate market indicators	5	5	3
Total Economic Points	50	100	25
Overall Points	200		100

banking professionals. Note that surveys and staff analysis which strive for an overall recommendation are categorized as qualitative analysis on the basis that this form of recommendation takes many non-quantitative factors into account. At the same time, the analysts and experts certainly do take relevant

Table 5.5 Specific factors included in country ratings

	Index Provider (See Endnotes)											
Index Subcomponents	*BoA*	*BERI*	*CRIS*	*EIU*	*EUROMY*	*INSTINV*	*MOODY*	*PRSICRG*	*PRSCOPL*	*S&P*		
Political and Policy		Qual		Qual	Qual	Qual	Qual	Qual		Quant/Qual		
Financial	Quant				Quant	Qual	Quant	Quant/Qual	Quant/Qual			
Economic	Quant	Quant		Quant	Quant	Qual	Quant/Qual	Q uant/Qual		Quant		
Operations		Quant/Qual										
Remittances and Repatriation of Capital		Quant/Qual										
Security			Qual									
Lending & Trade				Quant/Qual								
Export									Quant/Qual			
Direct Investment									Quant/Qual			
Index Type	Ordinal	Scalar	Ordinal	Scalar	Scalar	Scalar	Ordinal	Scalar	Scalar	Ordinal		
Data Sources												
Expert Panel		X							X			
Survey					X	X						
Staff Analysis			X	X			X	X		X		
Published Data	X	X		X	X		X	X	X	X		

Table 5.6 Primary components of country ratings

Factors	*Index Provider (See Endnotes)*				*INSTINV*	*MOODY*	*PRSICRG*	*PRSCOPL*	*S&P*
	BoA	*BERI*	*CRIS*	*EIU*					
Current Account/Balance of Payments	X	X		X	X	X	X	X	X
Debt	X	X		X	X	X			
Deficit	X	X		X	X	X	X	X	X
Economic Structure and Growth								X	X
(export concentration, reliance on imports	X	X		X	X	X		X	X
Foreign exchange/Currency convertibility	X	X		X		X		X	X
GDPPC/GDP	X	X		X		X		X	X
Liquidity		X		X			X		
Parallel Market						X	X		X
Reserves	X			X	X	X			X
Savings Rate				X		X		X	X
Inflation		X						X	X
Access to capital markets		X			X	X			
Factionalization									
(political, ethnic, religious, ideological, linguistic)		X	X	X	X	X	X		X
Social conditions/Conflict/History									
Attitudes/Expectations		X		X	X	X	X	X	X
Coercive regime/Legitimacy		X				X			
Bureacratic/Technocratic competence									
Corruption/Policy flexibility		X	X	X		X	X		
Criminal/Military Insurgency		X	X			X	X		X
International commitment/integration		X			X	X	X	X	X
Legal framework		X				X	X		
Nationalization		X				X	X		
Policy environment		X	X	X	X	X	X	X	X
Regional politics		X				X	X		X
Infrastructure and local service management		X				X			
Labor costs/productivity		X				X		X	

quantitative factors into account, just not in a formulaic manner as is true for a purely quantitative index.

Table 5.6 looks in more detail at the specific factors comprising each risk index. Moderately broad categories have been created to classify the many specific factors used by each group. This chart helps to identify the mix of quantitative and qualitative factors used by each group as well as the specific similarities and differences in the composition of the indices.

Finally, Table 5.7 provides a comparison of S&P and Moody's Ratings with both the II and ICRG ratings. The table reports the ratings in October 1995. There is a close correspondence between the S&P and Moody's ratings and the II credit risk measure with a rank order correlation of 95 per cent. There is also a strong correlation between these ratings and the ICRG financial rating (rank order correlation of 90 per cent). The correlations are weaker for the other measures. For example, the rank order correlation of the Moody's rating and the ICRG economic rating is only 68 per cent.

Other measures of risk

There are alternative metrics that can be used to develop expected return, volatility and correlation estimates in these countries. To be useful, the variable must be available for a wide range of countries on a timely basis. Some fundamental variables might include: per capita gross domestic product, the growth of gross national product, the size of the trade sector, inflation, the change in the exchange rate versus a benchmark, the volatility of exchange rate changes, size of the government sector, the external debt of a country, the number of years of schooling, life expectancy, quality of life and political risk. Work by Cantor and Packer (1996) shows that many of these variables are highly correlated with the sovereign credit ratings of Standard & Poor's and Moody's. Given the correlation between the risk measure we use in this chapter and the Standard & Poor's and Moody's ratings (Table 5.7), we believe that we are picking up many of these fundamental influences. Tables 5.8 and 5.9 provide some perspective on the relationship between the risk measures we have discussed and fundamental variables such as population, real gross domestic product growth, and inflation.

ESTIMATING EXPECTED RETURN, RISK, AND CORRELATION

Econometric specification

We fit our model using equity data from 49 national equity markets. Morgan Stanley Capital International (MSCI) publishes 21 of the indexes, and the International Finance Corporation (IFC) of the World Bank publishes the

Table 5.7 Comparison of sovereign country ratings and other risk attributes – December 1995

Country	*S&P*	*Moody's*	*II CCR*	*ICRGC*	*ICRGP*	*ICRGF*	*ICRGE*
Argentina	BB–	B1	38.8	70	74	34	31.5
Australia	AA	Aa2	71.2	82.5	83	44	37.5
Austria	AAA	Aaa	86.2	84	81	47	39.5
Belgium	AA+	Aa1	79.2	83	79	46	41
Brazil	B+	B1	34.9	62.5	64	33	28
Canada	AA+	Aa2	80.3	83	81	46	39
Chile	A–	Baa1	57.4	79.5	74	43	42
Colombia	BBB-	Baa3	46.5	68	60	40	35.5
Czech Republic	A	Baa1	58.4	82	80	42	41.5
Denmark	AA+	Aa1	79.9	87.5	84	48	42.5
Finland	AA–	Aa2	71.4	84.5	87	43	39
France	AAA	Aaa	89.1	82	80	44	40
Germany	AAA	Aaa	90.9	53	53	24	28.5
Greece	BBB–	Baa3	50	75	75	38	36.5
Hong Kong	A	A3	67	81	72	46	43.5
Hungary	BB+	Ba1	45	72.5	78	39	28
India	BB+	Baa3	46.1	69	63	37	37.5
Indonesia	BBB	Baa3	52.4	69.5	63	39	37
Ireland	AA	Aa2	73.4	84	85	44	38.5
Israel	A-	A3	49.2	72.5	66	42	37
Italy	AA	A1	72.3	77	75	41	38
Japan	AAA	Aaa	91.6	86	80	48	44
Malaysia	A+	A1	69.1	80.5	76	43	42
Mexico	BB	Ba2	41.8	66	65	37	30
Netherlands	AAA	Aaa	89.3	86	84	47	40.5
New Zealand	Aaa	Aa2	69.4	83.5	84	46	36.5
Nigeria	NR	NR	15.8	52.5	52	26	26.5
Norway	AAA	Aa1	81.6	87	83	46	44.5
Pakistan	B+	B1	30.7	59.5	54	33	31.5
Peru	NR	NA	25.8	60	56	31	33
Philippines	BB	Ba2	36.8	67.5	62	37	35.5
Poland	BB	Baa3	37.6	78	79	40	37
Portugal	AA–	A1	68.4	80	75	43	41.5
Singapore	AAA	Aa2	84	86	80	48	44
South Africa	BB+	Baa3	45.2	76.5	75	41	36.5
South Korea	AA-	A1	72.2	76.5	75	41	36.5
Spain	AA	Aa2	73.7	74	69	41	38
Sweden	AA+	Aa3	74.1	82	81	43	39.5
Switzerland	AAA	Aaa	92.2	89	85	50	43
Taiwan	AA+	Aa3	79.9	84.5	77	48	44
Thailand	A	A2	63.8	77	69	43	41.5
Turkey	B+	Ba3	40.9	62.5	59	36	30
UK	AAA	Aaa	87.8	74.5	68	41	39.5
USA	AAA	Aaa	90.7	83	80	48	38
Venezuela	B+	Ba2	31.4	66.5	65	34	34
Zimbabwe	NR	NR	31	64.5	66	31	31.5

Table 5.7 (*continued*)

Country	*S&P*	*Moody's*	*II CCR*	*ICRGC*	*ICRGP*	*ICRGF*	*ICRGE*
S&P Rank Correlation	–	–	95.2	87.6	77	90.2	72.4
Moody's Rank Correlation	–	–	95.1	87.5	79.5	89.8	67.6

Legend

ICRGC	International Country Risk Guide Composite Index
ICRGP	International Country Risk Guide Political Index
ICRGF	International Country Risk Guide Financial Index
ICRGE	International Country Risk Guide Economic Index
II CCR	Institutional Investor Country Credit Ratings

other 28. We view the MSCI national equity indexes as developed market returns and the IFC indexes as emerging market returns.

Our sample begins in April 1984 and ends in March 1996. Twenty-eight of the country indexes existed at the beginning of this analysis. We add developed country indexes to the analysis during the month that they were first introduced by MSCI. Emerging market country indices are added three years after introduction by the IFC.

We estimate a log-linear time series cross-sectional regression by combining all the countries and risk ratings into one large model. Specifically, we estimate using a pooled time-series cross-sectional regression:

$$\text{Return}_{i,t} = a + b \times \text{Country Risk}_{i,t-1} + \text{c} \times \text{Change in Country Risk}_{i,t-1} + \text{residual}_{i,t}$$

The slope coefficient of country risk should be negative, implying that a higher risk rating is associated with lower average returns. The slope coefficient of change in country risk should be positive, suggesting that an increase in credit rating is associated with higher returns.[4]

We also use the above model to explain the variance and correlation of returns over the period:

$$\sigma_{i,t} = \text{a} + \text{b} \times \text{Country Risk}_{i,t-1} + \text{c} \times \text{Change in Country Risk}_{i,t-1} + \text{residual}_{i,t}$$

and

$$\rho_{i,t} = \text{a} + \text{b} \times \text{Country Risk}_{i,t-1} + \text{c} \times \text{Change in Country Risk}_{i,t-1} + \text{residual}_{i,t}$$

Table 5.8 Summary statistics: Africa

Country	Population in Millions 1995	Real GDP: Average Annual Change 1978–87	1988–94	1995	Inflation: Average Annual Change 1978–87	1988–94	1995	Risk Ratings ICRGC	ICRGP	ICRGF	ICRGE	EMCRR	IICCR	S&P	Moody's
Algeria	28.6	1.7%	0.0%	3.9%	10.3%	24.8%	16.3%	56	50	38	25	37	22		
Angola			-4.4%	9.2%		366.8%	43.0%	52	50	23	32	20	13		
Botswana	1.5	11.0%	6.2%	4.4%	11.5%	12.0%	9.1%	77	72	40	42	58	50		
Burkina Faso	10.2	3.6%	2.7%	4.5%	5.2%	39.5%	7.8%	58	54	28	35	41	16		
Cameroon	13.3	7.4%	-5.4%	3.1%	9.8%	2.2%	26.9%	57	51	29	34	34	19		
Congo	2.5	7.7%	0.3%	0.9%	8.2%	10.2%	8.9%	57	57	29	27	23	14		
Cote d'Ivoire	14.2	2.4%	0.1%	6.5%	9.1%	5.9%	14.2%	60	59	29	32	41	17		
Egypt	59.2	5.9%	2.1%	3.2%	16.0%	16.6%	9.4%	69	59	40	39	49	34		
Ethiopia	56.9	2.5%	-2.0%	5.5%	6.7%	10.1%	11.4%	61	59	26	37	31	15		
Gabon	1.3	-3.9%	3.5%	2.8%	8.5%	4.6%	10.9%	66	59	35	38	39	25		
Gambia	1.1	2.5%	3.1%	-4.0%	16.0%	9.2%	5.0%	59	56	24	38	34			
Ghana	16.9	1.4%	4.6%	4.5%	51.5%	24.5%	58.1%	66	65	33	34	50	29		
Kenya	30.5	4.7%	2.9%	5.0%	11.4%	22.2%	1.7%	67	67	34	33	44	27		
Libya	4.9	-2.8%	-0.1%	1.2%	10.8%	12.8%	30.0%	67	59	34	42	23	7		
Malawi	9.8	2.6%	1.5%	9.9%	14.2%	19.7%	56.5%	61	64	28	29	39	20		
Mali	10.5	1.6%	2.8%	6.0%	7.4%	4.2%	12.4%	56	58	19	36	34	17		
Mauritius	1.1	4.1%	5.9%	4.1%	11.3%	8.9%	6.1%					55	50		Baa2
Morocco	27.1	3.3%	4.3%	-6.0%	8.8%	5.2%	6.6%	68	65	38	33	54	39		
Mozambique	17.4	-0.9%	6.3%	4.3%	26.5%	46.9%	44.3%	50	56	25	19	25	13		
Namibia	1.5		2.9%	1.7%		12.7%	9.3%	76	80	31	41	28			
Niger	8.9	1.4%	1.1%	3.0%	5.7%	4.2%	10.5%	49	47	26	24	33			
Nigeria	108.5	-0.6%	5.2%	2.9%	15.4%	37.7%	73.5%	53	54	23	29	32	15		
Senegal	8.1	2.3%	1.5%	4.5%	8.2%	4.1%	8.0%	61	59	29	33	39	22		
Sierra Leone	4.4		-1.4%	-10.0%	50.5%	58.7%	29.1%	43	39	16	31		8		
Somalia	9.1	1.9%	-1.2%	5.4%	37.5%	72.4%	16.3%	29	28	10	20	18			
South Africa	41.2	2.2%	1.0%	3.4%	14.5%	12.8%	8.9%	76	74	40	38	65	46	BB+	Baa3
Sudan	29.0	0.9%	4.1%	4.2%	28.3%	89.7%	85.0%	32	29	14	21	24	7		
Tanzania	30.3	2.0%	4.1%	4.5%	26.6%	25.2%	22.0%	64	64	33	31	32	18		
Togo	3.9	1.3%	0.1%	8.3%	5.8%	6.1%	14.7%	55	51	28	30	30	17		
Tunisia	8.8	4.6%	3.9%	3.5%	8.5%	6.2%	6.2%	70	70	36	31	65	45		Baa3
Uganda	20.6	1.9%	6.3%	6.5%	97.9%	25.2%	6.5%	55	52	25	32	42	15		

Table 5.8 (*continued*)

Country	Population in millions 1995	Real GDP: Average Annual Change 1978–87	1988–94	1995	Inflation: Average Annual Change 1978–87	1988–94	1995	Risk Ratings ICRGC	ICRGP	ICRGF	ICRGE	EMCRR	IICCR	S&P	Moody's
Zaire	42.6	1.3%	-6.9%	-0.7%	54.3%	13148.5%	533.3%	40	34	14	31	18	7		
Zambia	9.4	1.1%	0.2%		24.7%	114.2%	30.0%	62	65	29	31	35	16		
Zimbabwe	11.5	3.0%	2.7%	-1.1%	12.7%	21.4%.	23.0%	61	62	28	32	50	32		
Average	*19.5*	*2.5%*	*1.7%*	*3.2%*	*19.8%*	*420.2%*	*36.9%*	*58*	*57*	*28*	*32*	*38*	*22*		
Median	*10.5*	*2.2%*	*2.4%*	*4.1%*	*11.5%*	*14.7%*	*13.3%*	*60*	*59*	*29*	*32*	*35*	*17*		

Rank Correlations	Population	Real GDP: 1978–87	1988–94	1995	Inflation: 1978–87	1988–94	1995	ICRGC	ICRGP	ICRGF	ICRGE	EMCRR	IICCR
Population	1.00	-0.10	-0.04	0.17	0.28	0.39	0.31	-0.08	-0.05	-0.02	-0.15	0.01	-0.13
GDP (78–87)		1.00	0.00	0.00	-0.24	-0.31	-0.60	0.42	0.33	0.39	0.29	0.52	0.54
GDP (88–94)			1.00	0.00	0.20	-0.06	-0.29	0.29	0.37	0.18	0.08	0.44	0.37
GDP (95)				1.00	-0.11	0.07	0.04	-0.11	0.00	-0.11	-0.13	0.01	-0.01
Inflation (78–87)					1.00	0.72	0.42	-0.19	-0.13	-0.27	-0.17	-0.10	-0.22
Inflation (88–94)						1.00	0.52	-0.36	-0.30	-0.38	-0.38	-0.35	-0.51
Inflation (95)							1.00	-0.45	-0.36	-0.40	-0.41	-0.53	-0.56
ICRGC								1.00	0.94	0.85	0.72	0.65	0.78
ICRGP									1.00	0.74	0.57	0.63	0.72
ICRGF										1.00	0.48	0.65	0.77
ICRGE											1.00	0.39	0.42
EMCRR												1.00	0.89
IICCR													1.00

Sources: *World Economic Outlook*, International Monetary Fund, May 1996
International Financial Statistics, International Monetary Fund, June 1996

ICRGC International Country Risk Guide Composite Rating (5/96)
ICRGP International Country Risk Guide Political Rating (5/96)
ICRGF International Country Risk Guide Financial Rating (5/96)
ICRGE International Country Risk Guide Economic Rating (5/96)
EMCRR Euromoney Country Risk Ratings (3/96)
II CCR Institutional Investor Country Credit Risk Ratings (3/96)
S&P Standard & Poors Long Term Sovereign Foreign Currency Rating
Moody's Moody's Long Term Sovereign Currency Rating

Table 5.9 Summary statistics: IFC countries

Country	Population in Millions 1995	Real GDP: Average Annual Change 1978–87	1988–94	1995	Inflation: Average Annual Change 1978–87	1988–94	1995	Risk Ratings ICRGC	ICRGP	ICRGF	ICRGE	EMCRR	IICCR	S&P	Moody's
IFC New															
Egypt	59.2	5.9%	2.1%	3.2%	16.0%	16.6%	9.4%	69	59	40	39	49	34		
Morrocco	27.1	3.3%	4.3%	–6.0%	8.8%	5.2%	6.6%	68	65	38	33	54	39		
Russia	147.9		–14.8%	–4.0%		659.4%	190.2%	66	73	36	23	41	20		
IFC Frontier															
Bangladesh	117.8	4.1%	4.5%	4.7%	12.5%	6.2%	8.9%	59	51	29	38	49	27		
Botswana	1.5	11.0%	6.2%	4.4%	11.5%	12.0%	9.1%	77	72	40	42	58	50		
Bulgaria		4.7%	–3.9%	2.5%	1.7%	88.2%	62.1%	72	75	36	34	41	23		
Cote d'Ivoire	14.2	2.4%	0.1%	6.5%	9.1%	5.9%	14.2%	60	59	29	32	41	17		
Ecuador	11.5	2.4%	4.0%	2.5%	22.1%	51.1%	23.0%	61	56	31	35	44	26		
Ghana	16.9	1.4%	4.6%	4.5%	51.5%	24.5%	58.1%	66	65	33	34	50	29		
Jamaica	2.5	2.4%	1.3%	0.5%	20.7%	32.8%	19.9%	77	73	41	39	45	28		
Kenya	30.5	4.7%	2.9%	5.0%	11.4%	22.2%	1.7%	67	67	34	33	44	27		
Lithuania	3.7		–23.1%	5.3%		431.9%	36.5%					45	24		
Mauritius	1.1	4.1%	5.9%	4.1%	11.3%	8.9%	6.1%	83	84	44	39	55	50	BB+	Baa3
Slovakia	5.3		0.6%	7.4%		18.2%	9.9%	73	75	38	33	65	39	A	A3
Slovenia	2.0		3.3%	4.8%		26.1%	12.1%					66	46	BB+	Ba1
Trinidad	1.3	–2.1%	0.1%	3.5%	12.7%	8.2%	5.3%	69	63	37	37	39	17		Baa3
IFC New															
Average	78.1	4.6%	–2.8%	–2.3%	12.4%	227.1%	68.7%	68	66	38	31	48	31		
Median	59.2	4.6%	2.1%	–4.0%	12.4%	16.6%	9.4%	68	65	38	33	49	34		
IFC Frontier															
Average	16.7	3.6%	0.7%	4.2%	15.7%	53.0%	19.5%	69	68	36	35	51	32		
Median	5.3	4.1%	3.1%	4.5%	11.5%	20.2%	11.0%	69	69	36	35	47	27		

Table 5.9 (*continued*)

Rank Correlations	Population	Real GDP: 1978–87	1988–94	1995	Inflation: 1978–87	1988–94	1995	ICRGC	ICRGP	ICRGF	ICRGE	EMCRR	IICCR
Population	1.00	0.18	–0.11	–0.18	0.04	0.04	0.23	–0.71	–0.43	–0.52	–0.47	–0.29	–0.33
GDP (78–87)		1.00	0.14	0.05	–0.42	0.08	–0.16	0.37	0.28	0.30	0.17	0.34	0.44
GDP (88–94)			1.00	–0.03	0.20	–0.45	–0.41	0.11	–0.17	0.07	0.47	0.60	0.72
GDP (95)				1.00	–0.02	–0.12	–0.15	–0.13	–0.09	–0.35	–0.08	0.25	0.03
Inflation (78–87)					1.00	0.41	0.26	–0.21	–0.41	–0.09	0.53	–0.11	–0.11
Inflation (88–94)						1.00	0.72	0.07	0.35	0.00	–0.01	–0.29	–0.28
Inflation (95)							1.00	–0.19	0.15	–0.22	–0.21	–0.26	–0.37
ICRGC								1.00	0.77	0.89	0.44	0.44	0.61
ICRGP									1.00	0.62	–0.04	0.21	0.35
ICRGF										1.00	0.49	0.38	0.59
ICRGE											1.00	0.19	0.37
EMCRR												1.00	0.91
IICCR													1.00

Sources: *World Economic Outlook*, International Monetary Fund, May 1996
International Financial Statistics, International Monetary Fund, June 1996

ICRGC International Country Risk Guide Composite Rating (5/96)
ICRGP International Country Risk Guide Political Rating (5/96)
ICRGF International Country Risk Guide Financial Rating (5/96)
ICRGE International Country Risk Guide Economic Rating (5/96)
EMCRR Euromoney Country Risk Ratings (3/96)
II CCR Institutional Investor Country Credit Risk Ratings (3/96)
S&P Standard & Poors Long Term Sovereign Foreign Currency Rating
Moody's Moody's Long Term Sovereign Currency Rating

Table 5.10 Estimating expected returns, volatilities and correlations

Regression	*Attribute*	*Intercept*	*Log ICRGC*	*Change ICRGC*	*Obs*	*Adjusted R-Square*
A. Return	ICRGC	0.87	–0.17	1.95	431	6.6%
		1.68	*–2.43*	*2.50*		
B. Volatility	ICRGC	1.91	–0.38	–0.05	431	16.4%
		5.55	*–4.87*	*–0.22*		
C. Correlation	ICRGC	–3.21	0.79	0.06	431	21.5%
		–9.00	*9.75*	*0.17*		

Annual Observations: April 1984 to March 1996
Sample: 49 Countries (MSCI, IFC)
Sample excludes first three years of emerging market returns
Returns are unhedged US$ returns in excess of 1 Year US Govt Bond (Ibbotson)
Correlations are with the MSCI AC World (World before 1988)
All t-stats (italics) use a heteroskedasticity consistent (White) covariance matrix.
Correlation dependent variable = Correlation/(1 + Correlation)
ICRGC International Country Risk Guide Composite Rating
Change Attribute measures change in rating over period.

where $\sigma_{i,t}$ is the unconditional standard deviation of the monthly returns six months after the credit rating is observed, and $\rho_{i,t}$ is the correlation of a country's equity market with the world equity market six months after the risk rating is observed.

Results

Table 5.10 presents the regression results for the country risk model. We estimate returns, volatilities and correlations for a number of African countries, whether or not they have currently existing equity markets. Our universe consists of 34 African countries for which Political Risk Services supplies an estimate of country risk. In panel A, the slope coefficient on the level of country risk is significantly different from zero and of the correct sign (heteroskedasticity consistent t-statistic of –2.43). The slope coefficient on the change in the level of country risk is also significantly different from zero and of the correct sign. Panel B, the volatility model, shows that the coefficient on the level of country risk is negative and statistically significant. This means that a higher level of rating (lower country risk) is associated with a lower level of equity return volatility. Panel C, the correlation model, shows that the coefficient on the level country risk is positive and statistically significant. This means that a higher level of rating is associated with a higher level of correlation with the world equity market.

Fitted expected rates of return, volatility and correlation

Table 5.11 presents our estimates of annual expected return, volatility and correlation for 34 countries in Africa. The formula is simple. The natural logarithm of the most recent ICRG composite risk rating is multiplied by –0.17 (slope coefficient from Table 5.10) and added to 0.87 (the intercept from Table 5.10). We assume no future change in country risk rating in this exercise.

The average expected excess return for our universe of 34 African countries is 18.4 per cent. Compare this to expected rates of return for the developed world of 12 per cent, for the United States of 12.7 per cent, for Iraq of 25 per cent and for Argentina of 14 per cent. The higher expected excess return for Africa would be attainable only at the expense of higher expected annual volatility; 35.6 per cent for Africa compared to 21.4 per cent for the MSCI developed equity market. It is also true that for individual countries, higher expected returns come together with high expected volatility. It is important to point out the limitations of this analysis. We apply the relation between country risk rating and returns found in existing developed and developing equity markets to impute expected excess returns for African countries, the large majority of which do not have stock markets. Although the analysis predicts that expected excess returns in a number of countries with high risk would have to be quite high, the method does not take account of a country's institutional and political capacity or the economic development necessary to support a viable equity market. Arguably, it may be wise to exclude from the calculation countries with recent or ongoing civil wars.

There are two reasons that emerging markets are attractive to investors: expected return and correlation. Table 5.11 shows that correlations for these African countries are on average very low (5 per cent compared to an average correlation of 41 per cent for developed countries' equity markets). If most of these markets existed and were available to international investors, they would be very good portfolio diversifiers.

CONCLUSIONS

African countries represent a small amount of world GDP, a large part of world population, and an insignificant part of world equity capitalization. It is reasonable to suppose that these markets will grow in the future – especially as more countries create new equity markets. This article provides a method of assessing what to expect in these new markets.

The method we propose to forecast expected returns, volatilities, and correlations is simple and parsimonious. Of course, it is not necessarily the best model. Because of the nature of the problem, there is no way to verify the

Table 5.11 Expected returns, volatility, correlations for African countries

Country	*Expected Excess Return (%)*	*Expected Annual Volatility (%)*	*Expected Correlation with World*	*IFC Status*
Algeria	18.7	36.6	0.00	
Angola	20.0	39.4	–0.05	
Botswana	13.3	24.4	0.32	Frontier
Burkina Faso	18.1	35.2	0.03	
Cameroon	18.4	35.9	0.02	
Congo	18.6	36.3	0.01	
Cote d'Ivoire	17.6	33.9	0.06	Frontier
Egypt	15.2	28.6	0.19	New
Ethiopia	17.3	33.3	0.07	
Gabon	15.9	30.3	0.15	
Gambia	17.8	34.6	0.05	
Ghana	15.9	30.3	0.15	Frontier
Kenya	15.7	29.7	0.16	Frontier
Libya	15.7	29.7	0.16	
Malawi	17.4	33.6	0.07	
Mali	18.7	36.6	0.00	
Mauritius	18.5	30.1	0.16	Frontier
Morocco	15.4	29.1	0.17	New
Mozambique	20.6	40.9	–0.07	
Namibia	13.6	24.9	0.30	
Niger	21.1	42.1	–0.09	
Nigeria	19.7	38.7	–0.03	Existing
Senegal	17.4	33.6	0.07	
Sierra Leone	23.2	46.7	–0.16	
Somalia	29.8	61.9	–0.33	
South Africa	13.6	24.9	0.30	Existing
Sudan	28.2	58.1	–0.29	
Tanzania	16.5	31.5	0.12	
Togo	19.2	37.6	–0.02	
Tunisia	15.0	28.0	0.21	Frontier
Uganda	19.2	37.6	–0.02	
Zaire	24.6	50.0	–0.20	
Zambia	17.0	32.7	0.09	
Zimbabwe	17.3	33.3	0.07	Existing
Equal Weighted Average			*Count*	
Africa	18.4	35.6	0.05	34
IFC Existing	14.5	27.1	0.25	28
IFC New	15.5	29.3	0.17	3
IFC Frontier	16.9	29.9	0.17	14
US	12.7	22.9	0.70	1
Argentina	14.0	25.9	0.21	1
Iraq	25.0	51.0	–0.22	1
MSCI Developed	12.0	21.4	0.43	21

World–MSCI All Country World Index
Returns are in US$ in excess of one year government bond return.
Source: Erb, Harvey and Viskanta

accuracy of the results until some of the developing countries emerge into the MSCI or IFC databases.

Notes

1. These include South Africa, Nigeria and Zimbabwe. The IFC announced that Egypt and Morocco would be added in September 1996.
2. See Erb *et al.* (1994, 1995, 1996a) for a detailed analysis of the *Institutional Investor* data.
3. See Erb *et al.* (1996b) for an analysis of the ICRG data.
4. That is, an increase in rating (lower risk), implies that expected returns are lower which is achieved by an immediate price appreciation.

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DISCUSSION

Lemma W. Senbet on 'The Risks and Expected Returns of African Equity Investment' by Claude B. Erb, Campbell R. Harvey and Tadas E. Viskanta

Erb, Harvey and Viskanta have written an interesting and ambitious chapter on a challenging topic. In my discussion, I will highlight the need for such a study, restate the core of the study, provide a brief evaluation, and conclude with a commentary and suggestions.

Some positive developments in African finance: research justification

There is virtually no serious academic research on African equity markets. The reason is simple. There is no credible data. The International Finance Corporation has been tracking only three markets in Africa – Nigeria, Zimbabwe and South Africa. Of these three, South Africa can be classified among the world's emerging markets of the same class as those in Latin America and East Asia. Indeed, by recent estimate, South Africa's market capitalization, which is tenth largest in the world (but not very liquid), is about ten times the combined capitalization of the rest of African equity markets. Beyond those three markets tracked by the IFC, there are now eleven other stock exchanges in Africa, including those in Egypt, Morocco, Kenya, Zambia, Côte d'Ivoire, Mauritius, and Ghana, with an average capitalization of $2 billion (South Africa's is over 100 times that average). Moreover, these markets are illiquid, thin, and 'balkanized'.

There are now growing efforts among policy institutions and governments in Africa to develop synergy among these markets by way of pooling resources and harmonizing the requisite infrastructure for capital market development. Indeed, there is a prospect of developing regional markets anchored by three or four currency zones: the CFA zone (Western Africa), the Rand zone (Southern Africa), the Shilling zone (Eastern Africa), and the Mahgreb zone (Northern Africa). These synergistic efforts have already culminated into an establishment of the Africa Capital Market Forum (ACMF), which was launched at the June 1996 Accra conference (sponsored by the UN ECA and other multilateral and governmental agencies). The primary function of the ACMF is to serve as a clearinghouse and forum in the development of capital markets and promotion of integration among these markets.

Apart from regional co-operative efforts, there are other developments that I regard are positive. There has been a surge of Wall Street interest in the last year or so as evidenced by the establishment of a dozen funds in Africa, including Sub-Saharan markets outside South Africa, with a total investment level exceeding $1 billion. This investment level can be put in proper perspective with reference to 1992 when there was none.

Why this development? African stock exchanges have displayed greater openness to foreign investors. Indeed, over half of these markets have recently posted spectacular returns at levels, at least, as competitive with the other emerging markets on a risk–return tradeoff (eg. Côte d'Ivoire, Mauritius, Namibia, Nigeria, Ghana, Egypt, Zimbabwe, Swaziland). Moreover and potentially more significant, as the newly industrialized and emerging markets become more *integrated* with the advanced economies, the benefits of international diversification are bound to diminish. The apparent correlation between African markets and those of the developed countries is low, and hence generating potential for beneficial international diversification. At the same time, the allocation of global funds targeted to emerging economies has continued to increase, although it is still at a low level, and Africa, which is grossly under-represented (about 4 per cent of the emerging markets portfolio currently), has the potential to be part of the growing flow of global capital, if countries get their 'houses in order'.

In some circles, Africa is being viewed as the 'last frontier' for international portfolio investors as the newly industrialized and emerging markets become more integrated with the advanced economies. With proper policies that favourably affect risk–return profiles of investments, Africa can position itself competitively in markets for international capital. Note also that the average market capitalization of $2 billion for markets outside South Africa is roughly at the same level as the average for those emerging markets in Latin America and East Asia in the late 1980s, which succeeded in obtaining all the dramatic gains in portfolio flows in the late 1980s into the 1990s, with Africa bypassed completely.

Is Africa *too risky?* I hope this chapter and the volume will shed some light on this long-standing question. Despite the recent unprecedented political, economic and financial reforms that have taken place, Africa is still perceived by the international news media as a continent of war, famine, massive corruption, failed projects, grossly undisciplined governance, and gross violations of human rights. Coupled with these desperate images is the monolithic view about Africa, which ignores the remarkable cross-sectional variation in the continent. These problems often lead to perceptions of high, often untenable political and investment risks facing potential investors in Africa. Without denying political and other risk factors inherent in investments in 'pre-emerging' markets, a need exists to evaluate and quantify these risks in the context of modern finance for purposes of optimal investment strategies. I regard the chapter under discussion contributing to this task of proper evaluation of risk–return profiles of African equity investments. Potentially, rigorous and objective evaluations of risk–return tradeoffs are useful also for African countries as they rely more heavily on private sources of capital, including international capital, and as they attempt to put into place mechanisms to reduce and control investment and political risks.

Risk–return profiles: core finding

I regard the chapter under discussion as contributing to the 'positive' developments in Africa in two ways. First, it provides a reasonable framework (based on country risk analysis) for an evaluation of certain dimensions of the risk–return tradeoffs in African equities. It attempts to circumvent the oft-cited data problem that has been the culprit for absence of rigorous research in the context of Africa. Second, there is a potential to use such results for gauging the attractiveness of Africa for potential investors and suggesting appropriate policies in building the requisite financial infrastructure.

The first section deals with institutional details of country risk rating. I will not discuss the methodologies used by various rating services in establishing the risk indices, although the weaknesses of these rating systems should be noted. Instead I will focus on what I regard is the most important part of the chapter, namely the generation of risk–return profiles of African equity investments based on ratings and capital market data. Essentially, the authors combine data from developed and emerging equity markets (almost entirely non-African) with country risk ratings of these same countries (non-African) to impute expected returns, volatilities, and correlations on African equity investments. What is particularly curious is that equity investment

returns are imputed even for those countries which have *no* equity markets, or have little likelihood of developing one in the foreseeable future (Somalia, for example).

The approach is straightforward but innovative in an African context, with the potential to stimulate research on African capital markets. The slope coefficients on country risk measures from three pooled time series cross-sectional regressions (relating equity returns of developed and emerging markets, their volatilities, correlations *with* country risk measures) are used to impute the risk–return characteristics on African equity investments, using the composite risk ratings, on a country by country basis.

Commentary and suggestions

While I appreciate the novelty of the analysis, I wish to raise a few issues of concern and offer some suggestions.

Lending market risk vs. equity market risk

The riskiness and factors affecting loans and equity portfolio investments should not be treated as identical. Country risk ratings are designed to track sovereign risk, and more appropriately, external debt servicing capacity. In the parlance of commonly used factors in return generation of equity markets (Chen *et al.*, 1986, for example), the country risk ratings may be analogous to what has come to be known as the 'junk bond' or high yield bond premium.

In fact, the risk factors relating to liquidity, accounting disclosure and informational efficiency are more important for equity investments than fixed obligation contracts. In summary, the slope coefficients from the country risk factors are at best *incomplete* basis for the risk–return characteristics imputed for equity investments, and the results should be interpreted accordingly and with great caution. Further, the authors have a self-imposed constraint that excludes other macroeconomic factors that are commonly used in finance. I think they should relax the constraint, despite measurement issues. While I see a tradeoff here, it seems that it is difficult to bypass the African data problem – both macroeconomic and equity market data.

The law of one price of risk

The manner in which the slope coefficients in the country risk measures are used in fitting the risk–return profiles suggests that the prices of the risk factors are the same across the *control* sample of developed/emerging markets *and* African equities. If so, it is hard to swallow. There is ample evidence in the literature on segmented markets, where genuine market *segmentation* is

presumed to deliver divergent prices of risk. Indeed, these divergences are often used to assess the degree of market segmentation. Thus, I worry about what actually the measures in Table 5.11 represent in segmented markets with restricted capital market access and a host of other market imperfections. Africa is certainly at the forefront of such market imperfections and restrictions.

The role of Africa in international portfolio

What policy implications can we draw from the analysis? I would hope to gain insights into the benefits of international diversification into Africa beyond simple measures of correlations. While these low correlations are suggestive of potential benefits of Africa to the internationally diversified portfolio, one needs to construct efficiency frontiers from the *risk–return* profiles. Does Africa survive in an efficiently diversified international portfolio? Alternatively, which countries, even regions, end up in the dominant investment strategies facing international investors?

To dramatize the above point here, it would be curious to see, for instance, if the outlier countries, such as Somalia and the Sudan with high negative correlations, are viable from an international investment standpoint just on the basis of enhancing insurability of the overall international risk. Somalia and the Sudan are extreme cases, but it would be useful to conduct the analysis at least for more sober cases. This then establishes a rigorous foundation for calling greater attention to Africa as the 'last frontier' of international investments and mobility into an emerging markets club. Moreover, we need to conduct an analysis of the degree of market segmentation among various groupings of African markets. This then becomes a rigorous basis for promoting financial integration and the development of regional stock markets, such as those anchored by the Johannesburg and Abidjan stock exchanges.

Finally, is there a significant cross-sectional variation in the risk–return profiles generated by this study (see Table 5.11)? It is not clear. However, I am concerned that casual observation suggests that the profiles do not seem far apart for many countries. In some cases there are pairs of 'strange bedfellows' with virtually identical profiles: take, for instance, Congo and Mali; Uganda and Angola; Kenya and Libya; Ghana and Gabon; etc. We are left wondering about the pairing of Uganda, a potential African 'tiger', with Angola. The results might have to do with the contagion effect associated with the rating systems, which is discussed in other chapters in this volume. Otherwise, it would be hard to explain the pairing results on the basis of fundamentals, such as similarities in economic and industrial structures as well as governmental policies.

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