



Policy Brief

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The Conditional Pricing of Currency and Inflation Risks in Africa's Equity Markets

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The Executive Statement

The purpose of this policy brief is to inform the central bank monetary policy division that the exchange rate fluctuations and changes in inflation have a significant influence on the pricing of equity securities at the Stock Exchange. In particular, studies show that foreign investors consider exchange rates changes and changes in domestic inflation to constitute a key component of the total risk of equity investments. Consequently, these investors demand to be compensated for bearing these risks. In an environment in which exchange rates are volatile and there is instability in prices of goods and services, these are carried on into equity prices and introduce instability in equity prices as well. Clearly, there is need to ensure stability in exchange rates and prices in general. Thus, intervention measures may be necessary where exchange rates are believed to be extremely volatile. Similarly, since interest rates affect both inflation and exchange rates, the monetary policy division should institute measures, such as mandatory compliance with interest rate signals provided by the central bank rate (CBR), to ensure stability in interest rates.

Introduction

Africa's financial markets have recently attracted increased interest among international investors, largely on account of their low correlations with the rest of the world (Harvey, 1995), which makes them attractive for portfolio diversification. The interest in Africa's financial markets as an investment destination may also be explained by the fast pace of growth of many of Africa's economies (AfDB, 2013), recent remarkable risk-adjusted equity performance (Allen et al., 2011) and a positive relationship between risk and expected returns in most of Africa's stock markets (Alagidede and Panagiotidis, 2009).

Notwithstanding their immense diversification benefits, Africa is believed to be characterized by relatively higher volatility of asset returns driven by low liquidity, perceived high sovereign risk, (Abdalla and Murinde, 1997) as well as increased foreign exchange markets volatility (Giovannetti and Velucchi, 2009) which have adversely affected the attractiveness of her financial markets. Knowledge of the exact role played by each of these factors in driving equity prices is therefore important in driving policy formulation in the continent. We investigate the role of two of these factors – foreign exchange rates. The study takes the perspective of the global investor interested in Africa's stocks as a foreign investment. If they perceive exchange rate volatility to be a significant factor affecting their net returns, foreign exchange risk would command a premium that would constitute a part of their overall required rate of return on African stock investments. In addition, we also examine the role of inflation as a separate factor driving equity risk premia in Africa.

Methodology

We choose ten of the most trade competitive countries with the most viable capital markets in the African region¹. Through this set of countries, we also capture a sufficiently representative sample in terms of the level of economic development and spectrum of economic activity. The analysis uses aggregate equity market data. All categories of data and all returns are measured in US dollars for the period 1997:1 to 2009:12. This is the period during which foreign investors' participation had been allowed in most of Africa's financial markets and over which financial time series data are consistently available for the sampled countries. Observations are sampled at monthly intervals.

The exchange rate is defined as the African currency price of the US dollar; thus, a positive change indicates dollar appreciation. The relative change in the value of foreign currency, used in parameter estimation, is the log difference of trade-weighted real exchange rates, constructed as in Kodongo and Ojah (2011). Inflation is measured as the monthly rate of change in the consumer price index (CPI). Returns on all stock market indexes provided in African currencies are converted into US dollar returns using nominal exchange rates.

Our empirical investigation makes use of the stochastic discount factor model. The scaled factor methodology is used to estimate factor sensitivities (Cochrane, 1996) as well as factor risk

¹The countries sampled are Botswana, Egypt, Ghana, Kenya, Morocco, Mauritius, Namibia, Nigeria, South Africa and Tunisia. Other factors informing our country choice are liquidity of the stock markets and availability of data over the study period.

premia (Harvey and Kirby, 1995). The models are estimated through the sequential generalized method of moments (GMM). The instrumental variables used in GMM estimation are African inflation, world equity portfolio return, world equity market portfolio dividend yields in excess of the Eurodollar deposit rates and the USA term premium.

Results and conclusions

The results of our study show that foreign exchange risk (nominal and real) and inflation are significant macroeconomic variables that explain the opportunity cost of capital of equity investors in the African countries investigated. Therefore, high foreign exchange risk, arising from high volatility in exchange rates, causes equity investors to discount future cash flows at a higher rate of return (interest rate), implying that larger future cash flows are required to make the investor indifferent between a given current cash flow and an expected cash flow in the future.

Secondly, and perhaps very importantly, we find that foreign exchange risk is a conditionally priced factor in the equity markets. This means that foreign investors consider foreign exchange rate fluctuations to be an important variable affecting returns on their equity investments in African countries. Therefore, they demand compensation for bearing this risk. Further, foreign exchange risk premia are time varying, implying that investors demand less compensation for bearing the risk in periods when foreign exchange rates exhibit less volatility, and vice versa.

Third, the study finds that inflation risk is priced in Africa's equity markets with time varying risk premia, again indicating that periods of greater price stability in the economy witness less variability in equity prices as well. Further, the results suggest that inflation risk premia are negative. Thus, because high inflation today implies low growth in future real consumption, periods with positive inflation shocks tend to be bad states of nature and investors are willing to pay "insurance" by accepting lower equity returns in such periods, and vice versa.

Implications and Recommendations

The findings of our study suggest a strong need to have stability in exchange rates and inflation. Thus, intervention strategies should be considered in the management of floating foreign exchange rates to reign in wild and irregular fluctuations. Further, since Verdelhan (2010) has demonstrated that a direct relationship exists between interest rates and foreign exchange risk premia, the monetary policy department of the central bank must put in place policies that would ensure stability in interest rates as a way of controlling the impact of exchange rate fluctuations (and inflation) on equity prices. For instance, the central bank may consider strengthening the ability of the central bank rate (CBR) to inform borrowing and lending rates in the economy by taking punitive action against commercial banks that fail to comply or follow the CBR signal.

Similarly, stabilization policies must be put in place to deal with economic shocks that may put short-run pressure on factors that drive exchange rates and inflation. For instance, because of its wide utilization in the manufacturing sector, oil prices affect the prices of other commodities and the cost of transport. Thus, the central bank might require every oil distributor to hedge

their exposure to oil price fluctuations in derivative markets in an effort to cushion the economy against price instability introduced by oil price changes.

The foregoing observations clearly point to the need to broaden financial markets to include more innovative financial products and instruments, such as derivatives, that can aid in the hedging of exposure to currency and other risks encountered by equity investors. Although macroeconomic episodes, such as the recent global financial crisis, show that the derivatives tend to encourage speculative activities, which raises volatility in the financial markets with potential destabilization consequences, our recommendation is premised on the desirability of derivatives as tools for risk hedging and price discovery. Thus, if the government chooses to implement this recommendation, it must also legislate strong regulatory measures to discourage potentially disruptive speculative uses of derivatives.

References

- Abdalla, I. S. A., Murinde, V., 2007. Exchange rate and stock price interactions in emerging financial markets: evidence on India, Korea, Pakistan and Philippines. *Applied Financial Economics* 7, 25-35.
- AfDB, 2013. Promoting structural transformation and better use of natural resources. African economic outlook, 2013. African Development Bank, Tunis.
- Alagidede, P., Panagiotidis, T., 2009. Modelling stock returns in Africa's emerging equity markets, *International Review of Financial Analysis*, 18, 1-11.
- Allen, F., Otchere, I. and Senbet, L. W. 2011. African financial systems: a review. *Review of Development Finance* 1, 79-113.
- Cochrane, J. H., 1996. A cross-sectional test of an investment-based asset pricing model. *Journal of Political Economy* 104, 572-621.
- Giovanetti, G., Velucchi, M., 2009. Africa's financial markets: a spillover analysis of shocks. European Report on Development, Florence, Italy.
- Harvey, C. R., Kirby, C. M., 1995. Analytical tests of factor pricing models. Duke University Working paper, Durham NC.
- Kodongo, O., Ojah, K., 2011. Foreign exchange risk pricing and equity market segmentation in Africa. *Journal of Banking and Finance* 35, 2295-2310.
- Verdelhan, A., 2010. A habit-based explanation of the exchange rate risk premium. *Journal of Finance* 65, 123 - 146.