2. This is an important issue since most developing markets have been opened to foreign investors only in recent years.

3. See The Wall Street Journal, Mutual Funds: Quarterly Review; April 5, 1993.

4. If positivity of the variable m is also imposed, then the existence of m that satisfies (1) is equivalent to the absence of arbitrage opportunities, in the sense that assets with non-negative payoffs that are non-trivially positive must have positive prices.

5. For a derivation of traditional models of asset pricing from equation (1) see Ferson (1993).

6. For a generalization of this methodology to moments of different order see Snow (1991).

7. Using these results, $1/c$ can also be interpreted as the expected return on the portfolio that is uncorrelated with the tangency portfolio for each value of c.

8. A similar approach is used by Braun (1992) to establish whether physical investments are priced like financial assets.

9. See Newey and West (1987) and Andrews (1991) for a discussion of consistent estimators of the weighting matrix in the presence of autocorrelation and heteroskedasticity.

10. For a comparison between this spanning test and those proposed by Huberman and Kandel (1987) and Ferson, Foerster, and Keim (1993), see De Santis (1993).

11. The IFC also computes indexes for Indonesia, Portugal, and Turkey, but they are not included in this study because they cover a shorter period.

12. See IFC Index Methodology (1993).

13. The choice of the second sampling period is based on a compromise between having a sufficiently large number of observations to perform the tests and covering a period of increased liberalization. Unfortunately, the choice is somehow arbitrary because several EMDB markets have been opened to international investors only recently.

14. Harvey (1991) finds a 99.1 percent correlation between the MSCI U.S. index and the corresponding index computed by the Center for Research in Security Prices (CRSP) at the University of Chicago.

15. For empirical evidence in support of this measure see De Santis (1993).

16. For example, De Santis (1993) finds that the benefits of international diversification in developed markets are statistically significant only when investors use newly available information and hedge their position against currency risk.

Comments

Ross Levine

The paper by Professor De Santis is very carefully researched but does not link itself to the policy work of the World Bank. In commenting on the paper, I would like to highlight the basic messages of the paper, note (perhaps overemphatically) the absence of direct policy implications, and suggest how future research could tie this paper's findings to the World Bank's mission.

This paper is nicely written and the empirical work is done very carefully. Technically, the paper shows how the Hansen and Jagannathan method for deriving restrictions on asset pricing models can be used to derive a measure of how difficult it will be to find a model that simultaneously prices assets from different markets. Economically, the paper has two relatively uncontroversial conclusions. The pricing of assets in emerging stock markets seems to be different from the pricing of assets in developed stock markets. But, the paper does not tells us why this difference exists. We can only conclude that theoreticians will find it difficult to derive a single asset pricing model that, when confronted with data, explains stock returns in both sets of markets. The second conclusion is that investors can probably improve the risk-return performance of portfolios by investing in assets from emerging markets. Demonstrating these previously established findings using the latest techniques is valuable.

Importantly, however, the paper does not explicitly show that if an investor had held a portfolio that included emerging markets stocks over the last ten years, say, that the risk adjusted rate of return on this portfolio would have been better than a portfolio without emerging market stocks. So, the paper is not immediately useful to practitioners.

From the perspective of a World Bank policy analyst, De Santis does not connect his work with the problems I face in the field. Let me suggest the "Airline Criterion." Imagine yourself on an airplane on your way to Bolivia, or Tanzania, or China. You read De Santis paper and confirm your belief that there are probably benefits to holding a diversified portfolio. How will this help you develop a reform strategy when you land? How will this affect priorities? How does one use this research? The paper by De Santis would be more useful if somehow it linked its findings to these questions.

Let me give an example. A recent World Bank research project organized by Gerard Caprio studied firms in Ecuador and Indonesia before and after financial liberalization. The study found that there was a reallocation of the flow of credit from less efficient firms to more efficient firms

following financial liberalization. Now, it is true that this finding also has limitations in terms of the "Airline Criterion" noted above. Specifically, this finding does not tell us exactly which policies need changing, nor does it tells us whether banks or the stock market should be the focus of reform efforts, nor does it tell us the "right" type of regulatory structure. But, if I read this study on an airplane, I can use the findings when I land. A central way of increasing economic efficiency - and therefore economic welfare - is to get capital to where it can best be used. The research managed by Caprio tells me that improvements in the financial system can help. I then have to roll up my sleeves and focus attention on exactly how to improve the financial system in the country in which I am about to land.

De Santis does not draw a corresponding link between his findings and problems facing policy analysts. I would like to end by making this connection for De Santis. Basic research on the operation of equity markets is important for World Bank policy analysts because the Bank faces questions requiring a better understanding of the role of capital markets in economic development. Let me mention just one issue and also discuss how research along the lines of Professor De Santis may ultimately help address policy issues.

Country policymakers typically seek to promote both the level of investment in their countries and the efficiency with which these investments are allocated. External finance may help increase domestic investment and integration in world capital markets may improve the allocation of resources. It would thus be worthwhile knowing whether countries that are well integrated in major world equity markets enjoy faster rates of capital accumulation and faster rates of productivity growth than countries with capital markets that are less well integrated. The analysis in Professor De Santis paper offers a way of measuring integration, so that future research could use his measures to study the association between integration and both capital accumulation and productivity improvements. So the paper may serve as an input into more direct policy analyses of issues of critical importance to the World Bank's mission of promoting improvements in human welfare.