GAINS FROM PORTFOLIO DIVERSIFICATION INTO LESS DEVELOPED COUNTRIES’ SECURITIES

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Abstract. The paper substantiates the intuitive argument for international portfolio diversification—diversification that is not limited to the developed markets, but also includes the corporate securities of less developed countries (LDCs). Such diversification, in light of all the available evidence, appears to be desirable from the standpoint of the investor. Capital flows resulting from international diversification can tremendously improve liquidity position of the developing countries and provide a major development impact by increasing the probability of success of the capital market development programs being pursued by many LDCs; e.g., Brazil, Venezuela, Colombia, Indonesia, Nigeria, and Korea.

The pioneering works of Harry Markowitz\(^1\) and James Tobin\(^2\) resulted in the famous Mean-Variance (M-V) model, which demonstrates that the reduction in risk from portfolio diversification depends on correlations among return distributions of individual securities. Even though diversification among risky assets available in a particular country leads to risk reduction, the potential is rather limited due to the generally high correlations within an economy. This suggests the possibility of further risk reduction through international portfolio diversification. Accordingly, gains from such diversification have been suggested by Grubel\(^3\) (study of eleven developed countries for the period 1959-1966), Levy and Sarnat\(^4\) (study of twenty-eight countries for the period 1951-1967), and Grubel and Fadner\(^5,6\) (diversification into US-UK-West German stock exchanges for the period January 1, 1965, to June 30, 1967).

The above studies suffer from possible bias due to time period selection. Both Grubel and Levy-Sarnat studies lent themselves to the argument of gains from international diversification as a result of the time periods studied. On the other hand, the period selected by Grubel-Fadner was too short to draw meaningful conclusions. The past research also relied heavily on a single source of published stock price indices. The Levy-Sarnat work which included less developed countries (LDCs) ignored cash dividends and reduction in variance resulting from the presence of averaging in the indices. These problems have considerably reduced the impact of their findings.

Hence, the objective of this paper is to study the desirability of portfolio investments into the corporate securities of less developed countries. The problems of past studies are dealt with by the selection of multiple time periods; extensive use of quarterly data in addition to annual indices; multiple sources of data which include recent performance of leading domestic securities in a selected group of countries; collection and inclusion of dividend data in the analysis; and by estimating the bias resulting from use of averaged indices. A discussion of the barriers to such investments will be followed by potential responses including the Brazilian experience.

In order to provide the necessary theoretical underpinnings to the study, a brief description of the model follows.

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The Model

The study utilizes the M-V model for the generation of efficient sets of portfolios. Under this model, a portfolio $x$ is preferred to another portfolio $y$, if and only if,

$$\text{Ex} \geq \text{Ey} \text{ and } \text{Var}(x) \leq \text{Var}(y)$$

At least one of the strong inequalities must hold. The expected returns, Ex and Ey, indicate profitability of the two portfolios; whereas the variances, Var ($x$) and Var ($y$), indicate their risks. Alternatively, the M-V criterion can be defined as,

$$\text{Ex} \geq \text{Ey} \text{ and } \text{Var}(x) \leq \text{Var}(y)$$
$$\text{Ex} > \text{Ey} \text{ and } \text{Var}(x) \leq \text{Var}(y)$$

Thus, $\text{Ex} \geq \text{Ey}$ and $\text{Var}(x) \leq \text{Var}(y)$ each constitute a necessary condition for the portfolio $x$ to dominate portfolio $y$.

The portfolio expected returns are weighted averages of expected returns for individual securities making up the portfolio. Thus,

$$\text{Ex} = \sum_{i=1}^{n} w_i \mu_i$$

where $w_i$ and $\mu_i$ are, respectively, the proportion of and expected return for security $i$ in the portfolio of $n$ securities.

The portfolio variance is given by,

$$\text{Var}(x) = \sum_{i=1}^{n} w_i^2 \sigma_i^2 + 2 \sum_{i=1}^{n} \sum_{j>i}^{n} w_i w_j R_{ij} \sigma_i \sigma_j$$

where, $\sigma_i^2$ is the variance of return distribution for the security $i$ and $R_{ij}$ denotes the coefficient of correlation between the returns of securities $i$ and $j$.

Thus, the degree to which diversification reduces the variance of returns depends on the correlation between return distributions of securities in the portfolio. If returns for all securities are perfectly positively correlated with each other ($R_{ij} = +1$ for all $i$ and $j$), no reduction in portfolio variance will be achieved. On the other hand, if the securities are perfectly negatively correlated ($R_{ij} = -1$ for all $i$ and $j$), it is possible to reduce portfolio variance to zero. Thus, diversification in general reduces portfolio variance except in the extreme case where the returns are perfectly positively correlated.$^7$

The Data

To access the potential gains from international diversification into LDC securities, efficient sets of portfolios were generated using annual and quarterly stock price indices published by the International Monetary Fund (29 countries for the period 1957-1971) and Capital International Perspective (16 countries for the period 1958-1972).

The time periods were selected to avoid sharp discontinuities in the international markets and to include a period of a weakening U.S. dollar. Since the argument for diversification is largely based on correlation coefficients, and since our sample size of twenty-nine countries requires at least twenty-nine observations for an unbiased estimate of the correlation matrix, quarterly rather than annual indexes were used for the major part of the study.

To determine the percentage of optimal portfolios in the LDCs, the countries were divided into sub groups according to their respective stages of development. The following criteria were used:

- Less developed countries (LDC): US$ 0 - 1,000 GNP per capita
- Semi-developed countries (SDC): US$1,000 - 2,000 GNP per capita
- Developed countries (DC): US$2,000+ GNP per capita

The 1970 GNP per capita figures were used for this purpose. The exceptions to this rule were: (1) Italy and Japan are in the developed-country group, for obvious reasons; (2) South Africa is in the semi-developed-country group, a classification accepted by development economists. For a discussion of data sources, see Appendix.