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BENEFITS / COSTS OF DIVERSIFYING IN EMERGING MARKETS

by

NURHAN TOGUC

**A dissertation submitted to the Graduate Faculty in Economics
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy, The City University of New York**

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ABSTRACT**BENEFITS / COSTS OF DIVERSIFYING IN EMERGING MARKETS**

by

Nurhan Toguc**Adviser: Professor Thom B. Thurston.**

This study describes an empirical methodology for determining the allocation of funds in global markets. Country specific information variables and investor risk preferences are utilized within the Generalized Auto Regressive Conditional Heteroskedasticity in the Mean (GARCH-M) model along with mean-variance quadratic programming to investigate the benefits and costs of diversification into emerging markets.

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INTRODUCTION

The benefits of diversifying a portfolio across emerging market securities have been documented by previous authors(see Harvey, 1994 and Divecha, 1992). In general, international investments provide opportunities for achieving higher returns and the potential to reduce portfolio risk through diversification.

Recently there has been a growing interest by American investors in emerging markets. These markets are known to have higher volatilities and carry greater risks for the global investor. The studies by Harvey (1994) and Divecha (1992) indicate that stock price movements in these markets are less dependent on global factors than those of the developed markets. Hence, they offer the potential for greater diversification benefits than the developed country markets.

Modern portfolio theory introduced by Harry Markowitz in 1952 provides the tools for analyzing the benefits of such diversification. Given the expected returns, volatilities and correlations among individual security returns within the universe of feasible investment opportunities, one can derive an optimal portfolio by maximizing expected return for a given level of risk. In implementing modern portfolio, theory most researchers typically base their expected return and volatility estimates on historical return data that does not make use of the latest information variables often utilized by practitioners in evaluating risky assets.

The purpose of this study is to provide some guidelines to global investors in diversifying their portfolios into emerging markets. A utility-based mean - variance quadratic programming formulation is used to evaluate the benefits of diversifying a portfolio across emerging markets, given an individual investor's degree of risk aversion. A certainty equivalent value of each portfolio is derived (using Arrow's risk measure) to measure the cost of not diversifying into emerging markets for investors with given risk aversion parameters.

The study thus provides an empirical approach for determining the allocation of funds in global markets, considering the investor's time horizon and risk tolerance level, while utilizing the most current information variables. Optimal country portfolio weights, where each country is treated as a risky asset, are derived such that the portfolio allocation produces the highest expected utility for an investor with a given degree of risk aversion.

By analyzing the alternative opportunities of investing in a developed market portfolio alone versus investing in a combined portfolio that includes emerging markets, I expect to measure the incremental benefits / costs of diversifying into emerging markets.

The rest of the dissertation is organized into five main sections. The first section gives a review of literature on diversification benefits into emerging markets. The second section describes the econometric methodology employed for estimating the country

returns and variances. This section also describes the mean-variance portfolio optimization addressed in this study. The third section utilizes the quadratic programming portfolio optimization model to derive optimal portfolio country weights for investors with different degrees of risk aversion and discusses the benefits from diversification into emerging markets. Section four presents the certainty equivalent values of portfolios to measure the cost of not diversifying into emerging markets. The last section concludes the study.

The monthly forecasts of expected returns for each country are estimated by regressing stock index returns on country specific information variables. I first use standard equity valuation measures such as price-earnings ratios, price-to-book ratios and dividend yields at time $t-1$ to forecast the "base" stock market returns at time t . These valuation measures provide valuable specific information for each country's economy.

The empirical model of stock market returns is estimated by a Generalized Autoregressive Conditional Heteroskedasticity in the Mean (GARCH-M) process. The coefficients of the information variables are estimated by maximizing the likelihood function. Applying the estimated coefficients to the information variables then generates forecasts of returns for each country. One advantage of this empirical approach is that the volatilities of expected returns for each country are allowed to fluctuate over time. The GARCH-M model is used to predict the behavior of these time varying volatilities. The model predicts volatility for time t based on volatility estimates at time $t-1$ and a set of

estimated parameters. The forecasted expected returns and volatilities obtained from the GARCH-M model are then used as inputs into the optimization model.

Two efficient portfolio frontiers are then constructed in order to compare the return-to-risk profile of investing in developed markets alone versus investing in both emerging and developed markets. Each portfolio on these efficient frontiers represents a utility-maximizing portfolio profile for investors with a given degree of risk aversion. A measure of the shift or difference in the two frontiers then represents the relative incremental benefits of including emerging markets into a global investor's portfolio.

I- LITERATURE REVIEW

Global economic conditions and investment strategies are in constant change, presenting important challenges to the global investor. In general, diversifying a portfolio internationally is expected to yield higher diversification benefits because the correlations of asset returns among different countries are less than for portfolios constrained within the national boundaries, due to country specific risk factors.

The advantage for a US investor to diversify his portfolio across emerging markets may result from risk reduction benefits and / or the expectation of higher returns in these countries. These opportunities may arise because of differences in host countries' tax policies for foreign investors, the size of the market, its growth potential, the country's political stability or its long-term development strategy. Below I discuss some recent literature on the benefits of diversification in global markets.

Harvey (1994), in examining the impact of emerging equity markets on global investment strategies, finds that there is a significant benefit to including emerging market assets in a globally diversified portfolio. He quantifies these benefits by comparing the minimum portfolio returns. He evaluates six asset allocation strategies and derives the investment portfolio weights, during the 1980-1992 period. The first three portfolio allocation strategies examine traditional asset allocation based on historical averages of the expected returns, variances and covariances. The three strategies are:

a-Developed market portfolio:

b-Developed and emerging market portfolio;

c-Developed and emerging market portfolio with a 20% cap on emerging markets.

For each case he examines two policies:

1-*Hold the global minimum variance portfolio;*

2-*Hold the portfolio with a target volatility of 16%(annualized);*

The last three allocations use the same set of assets except conditioning information is used to forecast expected returns, variances and covariances, based on the following quadratic optimization model:

$$\max w' \mu$$

$$\text{subject to } w' L w = \text{Target}$$

$$w' 1 = 1$$

where w represents the investment proportion vector, μ is the expected asset return vector, and L is the variance covariance matrix. Harvey uses a linear OLS model to forecast conditional means as follows:

$$E[r_{i,t} | Z_{t-1}] = Z_{t-1} \delta_i$$

where $r_{i,t}$ is the return on country i from time $t-1$ to t , Z_{t-1} is the vector of forecasting variables including a constant, lagged world dividend yield, lagged world returns, lagged

country dividend yield and lagged country returns.

The forecast of the covariance between asset i and asset j is operationalized as follows:

$$\text{Cov}[r_{i,t}, r_{j,t} | Z_{t-1}] = E[\varepsilon_{i,t}, \varepsilon_{j,t} | Z_{t-1}]$$

The conditional covariance is thus the forecasted value of the product of the residuals for the regression models for asset i, j . The average conditional variance-covariance matrix is based on a sixty-month moving windows average of the product of the regression residuals.

Harvey found that strategies that included emerging markets outperformed the strategies that were limited to developed markets only. He concludes that there is a benefit to including emerging market assets in a globally diversified portfolio. Harvey also points out that using forecast variables to estimate mean returns improves the implied portfolio performance in comparison to using historical averages as mean returns.

Divecha (1992) also investigated diversification benefits into emerging markets. His study included twenty-three emerging markets and three developed markets (USA, Japan and UK) over a five-year period (January 1988-December 1992). He proposed

using a low-volatility approach to country allocation in the emerging markets, in order to reduce the risk of the global portfolio. The low-volatility portfolio is created by picking the weights of each country that would minimize the variance of the portfolio. Thus, each country was weighted according to how much it contributed to lowering the risk of the overall portfolio. Countries that had the lowest predicted volatility coupled with low correlation with other markets would be given the highest weight; those with high predicted volatility or high correlation with other countries would have the lowest weight.

To construct the portfolios, he used the following strategy:

1-Invest in low-volatility portfolio:

2-Invest in the International Finance Corporation (IFC) Global Composite Index.

Under *the low volatility strategy*, monthly total returns (in US\$) for each country for thirty-six months (from January 1985-to December 1987) formed the first variance-covariance matrix. Using this matrix, he computed the low-variance portfolio using quadratic optimization. Investors were assumed to hold this portfolio for one year, and the end of each year he used the previous thirty-six month data to compute the inputs of the optimization problem for the following year.

Under *the IFC Global Composite Index* Divecha uses the weights in the capitalization-weighted index produced by IFC. This index weights countries in proportion to their market capitalization.

Given the above strategies, Divecha concludes that the low volatility (LV) portfolio weight strategy outperforms the IFC Global Composite Index weight scheme over the same time period. He finds that the realized volatility (annualized standard deviation of monthly returns) of the LV portfolio over the five year period was 16.54 percent, as compared to 23.39 percent for the IFC Global Composite Index. Hence, individuals who invested in the LV portfolio would have reduced their risk more efficiently by diversifying into the emerging markets over the period under investigation.

Trevor (1996) investigates the impact of alternative risk estimation methods in the context of asset allocation decisions. The risk measures considered include the traditional historic average-fixed window method, the exponential smoothing model, and the GARCH model. His findings suggest that the choice of risk measure can make a significant difference in the asset allocation decisions. Trevor optimizes portfolios using the actual monthly return data. Asset allocation is made following one of the two strategies:

1- Minimum variance portfolio;

2- Expected returns for each asset is obtained by using average returns and the allocation is made by minimizing risk subject to a target return. The target return is an equally weighted average across all assets.

The inputs of the optimization problem are estimated using the GARCH model.

$$R_t = \mu + \varepsilon_t$$

where R_t are the returns at time t , μ is the historic average of returns obtained from

$$\mu = \sum_{i=1}^{t-1} \frac{R_{t-i}}{t},$$

and ε_t is the error term of the return equation at time t . ($\varepsilon = R_t - \mu$). The variance used is the conditional variance estimated using the GARCH(1,1) model, as follows:

$$\sigma_t^2 = a_0 + a_1 \sigma_{t-1}^2 + a_2 \varepsilon_{t-1}^2,$$

where σ_t^2 is the expected conditional variance at time t . The conditional variance captures its own recent past (σ_{t-1}^2) and the recent past values of the squared errors (ε_{t-1}^2) revealed by returns at time $t-1$. The parameters of the model (μ , a_0 , a_1 , a_2) are estimated by maximum likelihood procedures. The variance of each asset is assumed to follow a univariate GARCH process. The covariance of each asset pair is defined as:

$$\sigma_{i,j} = \rho \sqrt{\sigma_i^2} \sqrt{\sigma_j^2}$$

where ρ is the correlation matrix estimated over the same sample period as the variances. Trevor concludes that the GARCH model performs well in forecasting risk. He adds, however, using GARCH to estimate risk is impractical and costly. There are many variations of GARCH models. They were reviewed in the following section.

II- ECONOMETRIC MODELING AND THE MEAN-VARIANCE PORTFOLIO OPTIMIZATION PROBLEM

II-1- Econometric Modeling

In standard econometric models the variance of the error term is assumed to remain constant. When the variance of the error term is constant, the standard OLS regression can be employed for modeling.

Engle (1982) showed that time series data from financial markets exhibit periods of unusually large volatility, followed by periods of tranquillity. In such cases the data is conditionally heteroscedastic. Using OLS estimation in this case would still provide the best linear unbiased estimator, but the nonlinear Generalized Least Squares estimator (GLS) is more efficient. The heteroscedasticity would cause the OLS estimation to be inefficient. Engle's application of the Autoregressive Conditional Heteroscedastic (ARCH) model indicated that the heteroscedastic error term can be explained by the conditional variance. The simple first order ARCH model is of the form:

$$Y_t = \beta Y_{t-1} + \varepsilon_t$$

$$h_t = \text{Var}(\varepsilon_t) = \hat{\varepsilon}_t^2 = a_0 + a_1 \varepsilon_{t-1}^2$$

$$\varepsilon_t | I_{t-1} \sim N(0, h_t)$$

where a_0 , a_1 , β are the unknown parameters to be estimated and I_{t-1} is the available information at time $t-1$. The Y_t equation is referred to as the mean equation while h_t is called the variance equation. The variance equation gives the conditional variance of ε_t , which is dependent on the past realized value of variance at $t-1$ (ε_{t-1}^2) and a constant term (a_0).

The unconditional variance of the dependent variable (Y_t) includes both the predictable component, $Var(\beta Y_{t-1})$, and the unpredictable component, $Var(\varepsilon_t)$, of the mean equation. The unconditional variance of the dependent variable can therefore be written as:

$$Var(Y_t) = Var(\beta Y_{t-1}) + Var(\varepsilon_t)$$

The unconditional variance may be an inaccurate measure of current uncertainty since it includes both the variance of the predictable and the unpredictable components. However, the conditional variance measures only the variance of the unpredictable component, $Var(\varepsilon_t)$. The conditional variance is considered to be a better measure of uncertainty precisely because it represents the variance of the unpredictable component:

$$Var(Y_t) = Var(\varepsilon_t | \varepsilon_{t-1}) = h_t = a_0 + a_1 \varepsilon_{t-1}^2$$

The conditional variance uses recent information when predicting the variance at time t , which may be time varying (heteroscedastic).

The q^{th} order ARCH process uses only the most recent q squared residuals to estimate the conditional variance, i.e.,

$$h_t = a_0 + \sum_{i=1}^q a_i \varepsilon_{t-i}^2$$

The coefficients a_i have to be restricted in order to ensure the stability of the autoregressive process. These coefficients are assumed to be positive because the key in the ARCH process is that the errors are related through their variances. The conditional variance itself is an autoregressive process which causes conditionally heteroskedastic errors. This conditional heteroscedasticity in ε_t will result in Y_t being an ARCH process.

Bolerslev (1986) subsequently introduced the Generalized Autoregressive Conditional Heteroscedastic (GARCH) model. The GARCH model allows the conditional variance to depend on past conditional variance in addition to the past realizations of the error term. The simple first order GARCH model is:

$$Y_t = \beta Y_{t-1} + \varepsilon_t$$

$$h_t = a_0 + a_1 \varepsilon_{t-1}^2 + a_2 h_{t-1}$$

where h_{t-1} is the past conditional variance, with all other variables of both the mean and the variance equations being as defined before. The basic difference between the ARCH and GARCH models is the inclusion of the past conditional variance in the latter model.

The q^{th} order GARCH or GARCH(q,p) process is given as:

$$h_t = \alpha_0 + \sum_{i=1}^q \alpha_i \varepsilon_{t-1}^2 + \sum_{j=1}^p \alpha_j h_{t-1},$$

where all variables are as defined before.

Engle, Lilien and Robins (1987) introduced the ARCH in the mean (ARCH-M) process. This model allows the conditional variance (or conditional standard deviation) to be an independent variable of the mean equation. The first order ARCH-M model is given below:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 h_t + \varepsilon_t,$$

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2$$

The GARCH-M model is an extension of the GARCH model. The estimation techniques developed by ARCH and GARCH models incorporate the error effects into the framework of dynamic linear regression models, such as those given above for ARCH-M and below for GARCH-M models:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 h_t + \varepsilon_t$$

$$h_t = a_0 + a_1 \varepsilon_{t-1}^2 + h_{t-1}$$

where all variables are as defined before. It should be noted that either the conditional variance or the conditional standard deviation can be included in the regression equation for GARCH-M process. The difference between the GARCH model and the GARCH-M model is the inclusion of the conditional variance $h_{i,t}$ or the conditional standard deviation $\sqrt{h_{i,t}}$ as an independent variable in the mean equation.

In order to estimate the parameters of the mean and variance equation, the following procedure was developed by Engle (1982). To estimate the nonlinear GLS, the maximum likelihood method is used. The maximum likelihood estimation of ARCH and GARCH models is similar to those for ARCH-M and GARCH-M models. The likelihood function for the GARCH process is given below:

$$\ln L(\Theta_{i,t}) = -\frac{1}{2} \left[\log(h_{i,t}) + \frac{\varepsilon_{i,t}^2}{h_{i,t}} \right],$$

where $\varepsilon_t = Y_t - \beta Y_{t-1}$, and $\Theta_{i,t}$ is the vector of coefficients $a_0, a_1, \dots, a_p, \beta_0, \dots, \beta_q$. The initial values of these parameters are obtained from OLS regression. The successive values are calculated by using the previous set of results, iteratively, until the difference

of the results between two successive iterations becomes smaller or equal to a given small convergence criterion.

II-2- The Mean-Variance Quadratic Programming Problem

Formulation

Considering a universe of risky assets available to individual investors at any point in time, each individual investor has to decide: which assets to invest in and how much to invest in each risky asset so as to maximize his utility of wealth. Assuming that investors have equal amounts of initial wealth, W_0 , to invest in risky assets, each individual would choose a different investment bundle to maximize a specific utility function of wealth. For a given level of W_0 there is direct relationship between the rate of return on a risky investment, R (%), and wealth at later time 1, W_1 :

$$W_1 = W_0(1 + R) \qquad \text{II.2-1}$$

Characterizing the investment opportunities available to a investor by their expected rate of return and their risk, it is assumed that a typical investor maximizes his utility of wealth. Utility functions may take many forms; one which has been used to analyze investment decisions of individual investor is the negative exponential utility of the form:¹

¹ See Pratt et al (1965) , Raiffa, H. (1970) and Rubinstein, M.(1974) for a complete description of this utility function

$$U(W) = 1 - \exp(-kW) \quad \text{II.2-2}$$

where W is the amount of wealth obtained from an investment, $U(W)$ is the utility of wealth obtained from the investment and $k (>0)$ is a risk aversion parameter, measuring the investor's aversion to risk. The negative exponential is part of the widely used linear risk tolerance class of utility functions that produces portfolio separation in which the utility of the investor rises as his wealth from an investment rises. The utility of the investor rises at a decreasing rate at higher wealth levels, as can be seen from the first and second derivatives. The first derivative is:

$$U'(W) = k \exp(-kW) \quad \text{II.2-3}$$

Thus the slope of the utility function is positive ($U'(W) > 0$). This simply indicates that an individual prefers more wealth to less. This holds for both risk averse and risk loving investors. The second derivative is given below:

$$U''(W) = -k^2 \exp(-kW) \quad \text{II.2-4}$$

The second derivative is negative ($U''(W) < 0$), suggesting concavity in the slope of the utility function and indicating risk aversion. If the risk aversion parameter k is a large number, this indicates a conservative investor since the investor is satisfied with a low yield investment. A small value for k indicates that the investor is less conservative.

Assuming that investment opportunities can be evaluated based on their expected return and risk characteristics, one can utilize the above negative exponential utility function as the investor's objective function. Since higher utility values are assigned to investments with more attractive return versus risk profiles, investors can use the resulting utility values to rank investment opportunities. This utility function captures the relationship between risk and return of an investment as follows: Assuming that the return vector (R) on a selected set of risky investments, is normally distributed with mean μ and variance-covariance matrix V , the terminal wealth W is also normally distributed with mean $\bar{W} = \mathbf{R}'\mathbf{X}$ and variance $\sigma_w^2 = \mathbf{X}'\mathbf{V}\mathbf{X}$, where \mathbf{R} the vector containing investment returns and \mathbf{X} is the vector containing portfolio weights for each investment. The expected utility of wealth can then be computed by using the normal distribution function, $f(W)$ as:²

$$E[U(W)] = \int_{-\infty}^{\infty} U(W)f(W)dW \quad \text{II.2-5}$$

$$= 1 - \frac{1}{\sqrt{2\pi\sigma_w^2}} \int_{-\infty}^{\infty} \exp\left[-kW - \frac{1}{2}\left(\frac{W - \bar{W}}{\sigma_w}\right)^2\right] dW$$

$$= 1 - \exp\left(-k\bar{W} + \frac{1}{2}k^2\sigma_w^2\right)$$

$$^2 f(W) = \frac{1}{\sqrt{2\pi\sigma_w^2}} \exp\left[-\frac{1}{2}\left(\frac{W - \bar{W}}{\sigma_w}\right)^2\right]$$

Maximizing this expected utility is equivalent to maximizing $\ln E[U(W)]$, resulting in:

$$g(W) = k\bar{W} - \frac{1}{2}k^2\sigma_W^2 \quad \text{II.2-6}$$

Dividing both sides by the risk aversion parameter, k , one can obtain³:

$$h(W) = \bar{W} - \frac{1}{2}k\sigma_W^2 \quad \text{II.2-7}$$

Given the variance-covariance matrix, \mathbf{V} , the vector of expected returns, \mathbf{R} , the investor's risk aversion parameter, k , the vector of asset portfolio weights, \mathbf{X} , and defining

$\Phi = \frac{1}{2}k$, one can select a portfolio that maximizes the expected utility of wealth by

solving the following equivalent optimization problem:

$$\text{Max } h(R) = E(R) - \Phi\sigma_R^2$$

That is, the optimization problem can be expressed as a linear tradeoff between the expected portfolio return, $E(R_p)$, and the variance of portfolio return, σ_R^2 , with the investor's risk aversion parameter, Φ , determining the "rate of exchange" between portfolio mean and variance. In matrix notation:

$$\text{maximize } h(R) = \mathbf{R}'\mathbf{X} - \Phi\mathbf{X}'\mathbf{V}\mathbf{X} \quad \text{II.2-8}$$

subject to the constraints:

³ For further information see Varian, H (1992) *Microeconomic Analysis Third Edition* pp 189-190

$$\sum_{i=1}^n X_i = 1 \quad \text{or} \quad \mathbf{A}\mathbf{x} = \mathbf{b}$$

$$X_i \geq 0 \quad i = 1, \dots, n$$

The above maximization problem is thus redefined as a problem of allocating a given amount of cash, W_0 , among n securities, where the return vector \mathbf{R} is an n by 1 column vector whose elements are the expected returns on each security i , μ_i , \mathbf{X} is an n by 1 column vector where X_i is the fraction of wealth invested in the i^{th} security. \mathbf{V} is a n by n variance-covariance matrix whose diagonal elements are the variances (σ_{ii}) and the off-diagonal elements are the covariances between the i^{th} and j^{th} securities (σ_{ij}). \mathbf{V} is a symmetric matrix since $\sigma_{ii} = \sigma_{jj}$. \mathbf{A} is a 1 by n unity matrix, and \mathbf{b} is a 1 by 1 unity matrix. Φ is a measure of the willingness of an investor to accept risk in his portfolio. The optimal allocation of cash among the n securities is determined as a function of Φ . For example, if the investor acts as a gambler caring only about maximizing expected returns, $\Phi = 0$. In this case the objective reduces to the linear programming problem:

$$\text{maximize } h(R) = \mathbf{R}'\mathbf{X}$$

subject to the same constraints given above.

For an investor who does not want to accept any risk at all in the portfolio, $\Phi = \infty$ with the objective becoming the minimization of portfolio variance. Equation II.2-8, can be written in open form as follows:

$$\text{maximize } h(R) = [\mu_1 \ \mu_2 \ \dots \ \mu_n]_{1 \times n} \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix}_{n \times 1} - \Phi [X_1 \ X_2 \ \dots \ X_n]_{1 \times n} \begin{bmatrix} \sigma_{11} & \sigma_{12} & \dots & \sigma_{1n} \\ \sigma_{21} & \sigma_{22} & \dots & \sigma_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \sigma_{n1} & \sigma_{n2} & \dots & \sigma_{nn} \end{bmatrix}_{n \times n} \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix}_{n \times 1}$$

subject to

$$(1) \quad [1 \ 1 \ \dots \ 1]_{1 \times n} \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix}_{n \times 1} = [1]_{1 \times 1}. \text{ This constraint guarantees that portfolio weights}$$

sum to one.

$$(2) \quad X_i = s_i^2. \quad \text{This is the nonnegativity restriction prohibiting short sales of securities (each } X_i \text{ has a positive value).}$$

To optimize the objective function in equation II.2-8 subject to the stated constraints, the methods of Lagrange multipliers can be used. The Lagrange function for this problem can be formed as:

$$\mathbf{L} = \mathbf{R}'\mathbf{X} - \Phi\mathbf{X}'\mathbf{V}\mathbf{X} + \lambda(\mathbf{A}\mathbf{X} - \mathbf{b}) + \sum_{i=1}^n \phi_i(X_i - s_i^2) \quad \text{II.2-9}$$

or

$$L(X, s, \lambda, \phi) = \sum_{i=1}^n \mu_i X_i - \Phi \sum_{i=1}^n \sum_{j=1}^n \sigma_{ij} X_i X_j + \lambda \sum_{i=1}^n (X_i - 1) + \sum_{i=1}^n \phi_i (X_i - s_i^2) \quad \text{II.2-9'}$$

The first order conditions for maximizing $h(R)$ are:

$$(a) \quad \frac{\partial}{\partial X_i} = \mu_i - 2\Phi \sum_{j=1}^n \sigma_{ij} X_j + \lambda + \phi_i = 0 \quad \text{II.2-10}$$

$$(b) \quad \frac{\partial}{\partial \alpha_i} = -2\phi_i s_i = 0$$

$$(c) \quad \frac{\partial}{\partial \bar{x}_i} = \sum_{i=1}^n X_i - 1 = 0$$

$$(d) \quad \frac{\partial}{\partial \phi_i} = X_i - s_i^2 = 0$$

The first order conditions (a) and (c) are the first Kuhn Tucker condition while (b) and (d) are the second Kuhn Tucker condition for the quadratic programming problem. The first Kuhn Tucker condition, i.e., first order conditions (a) and (c), can be written in matrix form as:

$$\begin{bmatrix} -2\Phi \mathbf{V}_{n \times n} & \mathbf{A}'_{n \times 1} & \mathbf{I}_{n \times n} \\ \mathbf{A}_{1 \times n} & \mathbf{0}_{1 \times 1} & \mathbf{0}_{1 \times n} \end{bmatrix} \begin{bmatrix} \mathbf{x}_{n \times 1} \\ \lambda_{1 \times 1} \\ \phi_{n \times 1} \end{bmatrix} = \begin{bmatrix} -\mathbf{R}_{n \times 1} \\ \mathbf{b}_{1 \times 1} \end{bmatrix} \quad \text{II.2-11}$$

where \mathbf{I} is a unity matrix, $\mathbf{0}$'s are zero matrices, and all other variables are defined as before.

Above equation II.2-11 has $2n-1$ unknowns on the left hand side and $n-1$ knowns on the right hand side. It is therefore necessary to assign zeros to n variables in order to obtain a nontrivial solution. This optimization problem, however, involves looking into all possible combinations of n variables being zero, thus solving numerous sets of $n-1$ equations with $n-1$ knowns. The total possible combinations of n variables being zero out of $2n-1$ variables is given by:

$$P = \frac{(2n+1)!}{n!(n+1)!}$$

For instance, if we have $n=3$ three securities to choose from, our optimization problem will involve $\frac{7!}{3! \times 4!} = 35$ equations to be solved under the first Kuhn Tucker condition.

In order to account for the second Kuhn Tucker condition and further reduce the number of equations to solve, one can look at the first order conditions (b) and (d) in more detail. Together these imply the general form $\phi_i X_i = 0$. This indicates that in order to obtain a nontrivial solution in a given set of equations, ϕ_i and X_i cannot be both equal to zero for the same value of i .

The above quadratic programming solution method by Lagrangian multipliers can be summarized as follows: We first construct Equation II.1-11 which gives $n+1$ equations with $2n-1$ unknowns. We then assign zeros to all possible combinations of n variables,

thus resulting in P sets of equations with $n-1$ knowns and $n-1$ unknowns. To further reduce the total number of equations to solve and satisfy the first order conditions given in (b) and (d) above, we discard the equation sets containing zeros for both ϕ_i and X_i values. I then solve each equation to obtain nontrivial solutions of investment portfolio weights (X_i) along with the other parameters (ϕ_i, λ etc.). I evaluate the value of the utility function, $h(R)$, by substituting the X_i values into the utility equation. The maximization is achieved by the solution set which gives the highest nonzero value of the utility function. That is, we select the particular set of optimal portfolio weights X_i resulting in the highest value of the utility function for a given value of the risk aversion parameter, Φ . It should be noted that this procedure is repeated for different values of the investor risk aversion parameter.⁴

III- THE MEAN-VARIANCE QUADRATIC PROGRAMMING PROBLEM WITH THE GARCH-M MODEL

III-1 Introduction

In this section I concentrate on the nature of stock market index returns and

⁴ For this part see Pfaffenberger, R. and Walker, D.A (1976), *Mathematical Programming For Economics* pp.269-274

volatilities of returns in thirty countries. An empirical model to capture the effects of market information variables on monthly stock market returns is presented. In the basic model, the stock market returns are forecasted by regressing the returns on local information variables. Two basic formulations are used: the OLS linear regression model, and the GARCH-M process. The parameters of the GARCH-M process are estimated using the maximum likelihood procedure. These parameters are then used in estimating the portfolio optimization problem.

One main objective is to obtain efficient portfolio frontiers for each year under examination. I use recent past financial information variables that are country specific and modeled with GARCH-M. I then examine two different investment opportunity sets facing the global investor for specified relative risk aversion parameters. In order to compare how the return-to-risk profiles change among the two different efficient frontiers, I do the following: The first efficient frontier is estimated using only the indexes of the 15 developed nations, The second efficient frontier is estimated by combining the 15 developed markets with 15 emerging markets to form a diversified thirty-country portfolio.

A second objective is to examine the asset allocation decisions of the asset allocation decisions of different types of investors, depending on the degree of their risk aversion. Finally a risk premium is calculated to provide a certainty equivalent dollar

measure of the diversification benefits for the portfolio choice of individuals with given risk aversion parameters.

III-2 Data

The data used in this study are obtained from two main sources. The rates of return on the stock market index for emerging markets come from the Emerging Market Data Base (EMDB) constructed by the International Finance Corporation (IFC). Emerging markets is a term introduced by The World Bank as a definition for developing countries with GNP per capita less than US\$ 7,910 as of 1991. Total capitalization in these markets was approximately US\$ 650 million as of December 1992.

The fifteen emerging market countries included in this study are listed below. According to IFC, these countries' stock markets provide free entry and exit for foreign investors, have internationally acceptable accounting standards and acceptable investor protection. Argentina, Brazil, South Korea, Mexico, Taiwan and Turkey are considered to be among the ten big emerging markets by IFC, along with China, India, Indonesia, South Africa and Poland. The emerging country markets are:

<u>COUNTRIES</u>	
1	ARGENTINA
2	BRAZIL
3	CHILE

4	COLOMBIA
5	MEXICO
6	VENEZUELA
7	KOREA
8	PHILIPPINES
9	TAIWAN
10	INDIA
11	MALAYSIA
12	THAILAND
13	GREECE
14	PORTUGAL
15	TURKEY

Data for the equity markets of industrialized countries are obtained from the Morgan Stanley Capital International data set (MSCI), a monthly publication of Morgan Stanley. These countries' markets have common characteristics, which differ from those of emerging markets. The developed countries included in this study are listed below:

COUNTRIES

16	AUSTRALIA
17	AUSTRIA
18	BELGIUM
19	CANADA
20	FRANCE

21	GERMANY
22	HONG KONG
23	ITALY
24	JAPAN
25	NETHERLANDS
26	NEW ZEALAND
27	SPAIN
28	SWITZERLAND
29	UK
30	USA

The indexes computed by the IFC are consistent across all emerging markets and are comparable. The stocks included in the indexes are selected on the basis of market size, trading activity, and sector representation. The IFC also provides an index that includes dividend payments so that total rates of return series for all the emerging markets which include capital gains and dividend yields are readily computed. The data set includes total monthly rates of return from January 1989 to December 1994 for fifteen emerging markets. All returns are given in US dollars along with local currencies by IFC, but I use only returns in dollars in this study. The IFC uses exchange rates from the Wall Street Journal and/or the Financial Times to convert the local currencies into US dollars.

The MSCI data set includes total monthly rates of returns from January 1989 to December 1994 for the fifteen equity markets of industrialized countries. In this data set

as well. the indexes available from MSCI are used to compute monthly returns in US dollars. All returns are total returns assuming reinvestment of dividends), and before transaction costs or taxes, including dividend taxes withheld in each market.

III-3 OLS Estimation, Optimal Lag Length and Heteroscedasticity Tests

Harvey (1994) emphasizes that in any asset allocation problem accurate estimates of inputs are the most important component of the problem. Using historical returns and a constant variance-covariance matrix to compute mean-variance efficient portfolios will not produce optimal results since past behavior of stock prices is by no means a guarantee of future behavior. Hence it is critical to obtain the best possible inputs for the optimization process. Following Harvey, we assume that expected returns are not simply the means of past returns but that they can be estimated by observing current information variables. Harvey (1994) suggests building linear regression models using various information variables that are available to portfolio managers to estimate conditional mean returns. This can be formulated using a simple OLS equation as follows:

$$R_{i,t} = \beta_0 + \beta_1 Z_{i,t-1} + \varepsilon_{i,t}, \quad \text{III-1}$$

where $R_{i,t}$ is the rate of return on country index i from $t-1$ to t , and $Z_{i,t-1}$ is an 1 by n vector of n country specific information variables known at time $t-1$. The regression equation in compact form (following Harvey) is:

$$R_{i,t} = Z_{i,t-1} \delta_i + \varepsilon_{i,t} \quad \text{III-2}$$

where δ_i is an n by 1 coefficient vector. The conditional expectation of the country index return $R_{i,t}$ is defined as the mean return and is a linear function of information variables:

$$E[R_{i,t} | Z_{i,t-1}] = Z_{i,t-1} \delta_i \quad \text{III-3}$$

In this regression equation the conditioning information variables are available at time $t-1$, and they are used to forecast the next period returns for time t . The coefficients of these variables are estimated using monthly data over the sampling period t and information variables through $t-1$. These the coefficients are applied to the information variables known at time t and are used to calculate forecasts of returns for time t . At t we reestimate the model using new coefficients and information variables to form the forecasted returns for $t+1$. Our regression equation in open form is given as:

$$\text{Return}_{i,t} = \beta_0 \text{Constant} + \beta_1 (\text{Return})_{i,t-1} + \beta_2 (P/E)_{i,t-1} + \beta_3 (P/BV)_{i,t-1} + \beta_4 (\text{DIV})_{i,t-1}$$

where P/E is the price earnings ratio, P/BV is the price-book value, DIV is the dividend yield (known at time $t-1$) and $\delta_i = (\beta_0, \beta_1, \beta_2, \beta_3, \beta_4)$ is the coefficient vector to be estimated.

Financial analysts have been evaluating common stocks by using financial accounting information such as dividend yields, price-earnings ratios, price-to-book values etc. Research by Fama and French (1989) found that stock returns are positively related to dividend yields, usually high yields. Fama and French argued that systematic patterns in the variation of expected returns are linked to business cycles. Dividend yields tend to be high at low points in the business cycle; when wealth is low investors put a higher price on risk, thus leading to higher expected returns.

Studies by Basu (1977) and Banz (1981) showed that high price-earnings ratios imply higher than average returns. Capaul et al. (1993) showed that price-to-book value ratios (value stocks) is a simple but useful measure in evaluating equities, especially in the US. G. Gerber, president of Twin Capital Management Inc., suggests indicates the use of such information variables in building portfolios. He defines two basic styles of portfolio management: value and growth. He explains the growth-style management as concentrating on forecasts of future earnings streams, with less attention given to current price. If a growth manager forecasts a positive change in earnings, the stock may be purchased. Gerber defines value-style management as focusing on dividend yield and P/E

ratios. A value manager would concentrate on high yield stocks with low P/E ratios, while paying less attention to earnings prospects.⁵

I assume that each country-return index at time t can be forecasted by observing the country-specific information variables given above at time $t-1$. The information variables used in this study have been studied in the US and Japan by Fama and French (1992) and by Harvey in emerging markets (1994).

After defining the information variables in our forecast equation, the optimal lag length of the return variable is to be determined. I use two different information criterion namely the Akaike Information Criterion (Akaike, 1973) and the Schwartz Criterion (Schwartz, 1978), to determine optimal lag lengths. These two tests are single equation tests as given below:

$$\text{Akaike: } T \log(RSS) + 2K$$

$$\text{Schwartz: } T \log(RSS) + K \log T,$$

where T is the number of observations. RSS is the sum of squared residuals, and K is the number of regressors. The criteria for selecting the lag length are based on minimizing the above functions over different lag lengths. The Schwartz criterion does not choose a lag length larger than the Akaike criterion. The difference between the two is that the Schwartz criterion penalizes for additional parameters chosen.

⁵ See Lederman, J. and Klein, A.R. (1994), pp. 108-109

Table 1 presents the test results for the Akaike and Schwartz criteria for all thirty countries for the mean equation. I have used lag lengths up to twelve lags to test the optimal lag length. The results of Schwartz' criteria indicate one lag is a better representation in terms of capturing the dynamics of the return data. the Akaike Criterion, however, produced higher optimal lag lengths for several countries, including Belgium, France, Spain, Switzerland, UK and USA. As a result of the lag test, I decided to use the Schwartz test results and included one lag in the forecast equation, since inclusion of higher lag lengths would decrease the number of data points used in forecasting returns.⁶

Giovannini and Jorion (1987) report conditional heteroscedasticity in the returns of US stocks. Later it was shown by Attanosio (1988) that conditional heteroscedasticity exists in several other countries' stock index returns. Following this research, we test the residuals of the OLS regression to investigate the existence of heteroscedasticity. To test the ARCH (GARCH) effects, Engle (1982) suggested the use of the ARCH test. The first step in testing for the ARCH effects is to estimate the regression equation III-2 by OLS to obtain the residuals. Then the residuals of OLS are regressed on a constant and one of its own lagged values as follows:

$$h_{i,t} = \text{Var}(\varepsilon_{i,t}) = a_0 + a_1 \varepsilon_{i,t-1}^2,$$

⁶ For further information see Enders, W (1995) pp 88,315

where a_0 is constant, and a_1 is the coefficient of the ARCH process. The next step in testing for ARCH is to define the null hypothesis H_0 such that; $H_0 = a_1 = a_2 \dots a_q = 0$, in which case the error variances would be constant (homoscedastic errors). Comparison of TR^2 (T is the sample size and the uncentered R^2 is obtained from the regression of OLS residuals on its own lagged values as given above).

The results of the regression of the residual sum of squares for thirty countries are given by Table 2, when the length of the lags are selected as one ($q = 1$). The steps of the ARCH test can be summarized as follows:

First, perform the OLS regression given by equation III-2 for each country over the sampling period. Then save the residuals from each regression. Estimate a regression of the squared residual on a constant and the lagged values of the squared residual. The next step is to obtain the TR^2 . The χ^2_1 with one degrees of freedom (at 5%) provides a reference to acceptance or rejection of the null hypothesis. TR^2 converges to the χ^2 distribution under the null hypothesis. If the value of TR^2 exceeds the critical value of the χ^2 distribution with one degree of freedom, we can reject the null hypothesis that the error terms of the regression are constant since the critical value of χ^2 with 95% confidence level produces a χ^2 value of 3.84, which is less than TR^2 for all thirty countries. We can therefore detect existence of heteroskedasticity in the error terms in this way. The ARCH test results for all countries are presented in Table 2. Low TR^2

values indicate a relatively weak ARCH process, therefore suggesting considerably less heteroskedasticity.

III-4 GARCH-M Estimation Of Inputs

Our estimation of the country returns and variances is based on the GARCH-M (1,1) model, where the initial estimates of the parameters are obtained using OLS regression. This specification provides a good fit for many financial time series. I use the following GARCH-M univariate mean equation to forecast each country's conditional returns:

$$R_{i,t} = Z_{i,t-1} \delta_i + \sqrt{h_{i,t-1}} B_{i,t} + \varepsilon_{i,t} \quad \text{III-4}$$

This standard GARCH-M mean equation includes conditional information variables, where $\varepsilon_{i,t}$ is the forecast error for the return index of country i assumed to be normally distributed with zero mean and variance, $h_{i,t}$. The $\sqrt{h_{i,t}}$ is the conditional standard deviation and $R_{i,t}$ is country i 's index returns. The return index of each country exhibits heteroscedasticity in the error terms as shown in Table 2. To account for this heteroscedasticity I use the GARCH-M process to estimate returns and variances. As discussed earlier, if the heteroskedasticity is not properly accounted for in the estimation

of parameters, an inefficient estimation will occur: if $R_{i,t}$ is misspecified, then $h_{i,t}$ will also be misspecified. Following the standard univariate GARCH-M model specification, I include the standard deviation of the error term in the forecast of the country returns as an explanatory variable.

The conditional expected return and variance for each country is thus estimated by using the univariate GARCH-M process. As indicated by Trevor (1996) when risk (measured by variance) is changing, the best risk estimates are those which place greater emphasis on the most recent information. These estimates are obtained as follows:

The monthly conditional expected return on country i (the mean equation of GARCH-M) is:

$$E[R_{i,t} | Z_{i,t-1}] = Z_{i,t-1} \delta_i + \sqrt{h_{i,t}} B_i \quad \text{III-5}$$

and the conditional variance for each monthly return series for country i (the variance equation of GARCH-M as given by Trevor [1996]) is:

$$h_{i,t} = \sigma_{i,t}^2 = a_0 + a_1 \varepsilon_{i,t-1}^2 + a_2 h_{i,t-1}; \quad \text{III-6}$$

the conditional standard deviation is:

$$\sqrt{h_{i,t}} = \sigma_{i,t} = \sqrt{a_0 + a_1 \varepsilon_{i,t-1}^2 + a_2 h_{i,t-1}} \quad \text{III-7}$$

where $\varepsilon_{i,t-1} = R_{i,t-1} - E[R_{i,t-1} | Z_{i,t-1}]$, a_0 is a constant, a_1 is the coefficient of the lagged value of the regression sum of squares, and a_2 is the coefficient of the lagged value of the conditional variance. In this process the conditional variance, $h_{i,t}$, is a linear function of the previous variance.

Equation III-5 expresses the expected return on country i at time t as a function of information variables at time $t-1$ and the conditional standard deviation at time t , while equation III-6 is the expected conditional variance of returns at time t . The conditional variance is explained as a function of its own recent past ($h_{i,t-1}$) and by the recent values of the squared unexpected variation in returns ($\varepsilon_{i,t-1}$) for each country. As indicated by Trevor (1996), the motivation for using GARCH to model the changing variance is that the conditional variance captures the short-term variance and ordinary variance represents the long-term volatility. Hence investors should be more concerned about the short-term variance in asset allocation.

The parameter vector δ_i is the coefficient vector of information variables, B_i is the coefficient vector of the conditional standard deviation modeled by GARCH in equation III-5, and a_0 , a_1 and a_2 are the GARCH-M coefficients. The maximum likelihood estimates of the GARCH-M model are obtained by maximizing the likelihood

function with respect to unknown variance parameters. The likelihood function is given by:

$$L_t(\delta_t, B, a_0, a_1, a_2) = -\frac{1}{2} \left[\log(h_t^2) + \frac{\varepsilon_t^2}{h_t} \right] \quad \text{III-8}$$

where δ_t is defined as the true parameter vector in the model given by equation III-5 and a_0, a_1 and a_2 are as defined by equation III-6. All the coefficients are estimated simultaneously.

The expected returns and variances (or standard deviations) given by equations III-5 and III-6 (or III-7) are thus estimated using the GARCH-M model. The previous forty-eight monthly observations used to estimate returns for 1992. This procedure is repeated for years 1993 and 1994 for each country.

Table-3 presents the results of GARCH-M processes with the lag length selected as one. It includes the parameter estimates of the maximum likelihood procedure. The initial values of the beta coefficients for the information variables are obtained from the OLS regression equation. A visual inspection of Table-3 indicates that the sign and statistical significance of the estimated coefficients vary considerably.

The important difference between OLS estimates and GARCH-M estimates can be summarized as follows: The OLS assigns constant weights to the variance term of the

regression, while in the GARCH-M model the weights α_i depend on i and the order of α_i is chosen.

By substituting the coefficient estimates from Table-3 into the GARCH-M model given by equations III-5 and III-6 we obtain the inputs of the portfolio choice problem. These estimates are then used for calculating the correlations among country returns from:

$$\rho_{i,j} = \frac{\sum (R_{i,t} - E[R_{i,t}|Z_{t-1}]) (R_{j,t} - E[R_{j,t}|Z_{t-1}])}{\sqrt{\sum (R_{i,t} - E[R_{i,t}|Z_{t-1}])^2 \sum (R_{j,t} - E[R_{j,t}|Z_{t-1}])^2}} \quad \text{III-9}$$

where $\rho_{i,j}$ is the conditional correlation coefficient between the return indexes for countries based on the information variables. The conditional variance-covariance matrix is calculated by the procedure suggested in Trevor (1996). This procedure combines the correlation estimates with variance estimates as follows:

$$V = Cov(R_i, R_j) = \rho_{i,j} \sqrt{h_{i,t} h_{j,t}} \quad \text{III-10}$$

V is the conditional variance-covariance matrix. $h_{i,t}$ is the diagonal elements of the matrix (variance terms) and $\sqrt{h_{i,t}}$ is the standard deviation of return of each country obtained by using the GARCH-M model and $\rho_{i,j}$ are defined above. The variance-covariance matrix along with expected returns for the year 1992 are estimated using

forty-eight recent month by observations. These expected return and variance-covariance estimates change during 1993 and 1994. Thus; use the recent estimates as inputs for the asset allocation problem each year. Once the portfolio is formed by solving the quadratic programming problem, the investor is assumed to hold is portfolio over a one year period. At the end of the year, the portfolio is reoptimized using the updated information.

III-5 The GARCH-M Mean-Variance Quadratic Programming Problem And Efficient Frontier

The portfolio manager's objective in choosing a portfolio is to maximize expected return for a given level of risk. Given the estimates of the expected returns, variances and covariances of country indexes and the risk aversion parameter of a specific investor one can apply the quadratic optimization techniques of portfolio selection. The problem here is to choose the optimal forecasted asset allocation. Optimality implies that the forecasted portfolio allocation produces the highest feasible expected utility for an investor with a given relative risk aversion. The relative risk aversion of the investor is determined by his particular utility for wealth. The optimal allocation of wealth is thus determined for different values of risk aversion, and a set of efficient portfolios identified as a function of the investor's risk position.

The portfolio manager should of course choose from among the portfolios lying

on the efficient frontier, but selecting the best among them (in the sense of a riskless security) depends on the investor's individual preferences for risk. The investor's objective is to maximize the expected portfolio return per unit of risk (or reward to variability) for his given degree of risk aversion.

The mean-variance efficient portfolio is computed by solving the quadratic programming problem summarized below:

$$\text{Max } U = \sum_{i=1}^n E[R_i] X_i - \Phi \left[\sum_{i=1}^n X_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{j=1}^n X_i X_j \rho_{i,j} \sigma_i \sigma_j \right] \quad \text{III-11}$$

subject to

$$1- \sum_{i=1}^n X_i = 1$$

$$2- X_i \geq 0 \quad \text{for all } i \quad \text{where } i = 1, 2, 3 \dots n.$$

The first term in equation III-11 is the expected conditional return of the portfolio, the second term is the variance of the portfolio Φ is the risk aversion parameter, n is the number of country indexes (treated as assets) considered, X_i is the percentage of available money that will be invested in country i , $E[R_i]$ is a 1 by n vector of annual expected returns for n countries. Each element of this vector is the annual expected conditional return on the country index i , obtained from the GARCH-M model. $\sigma_{i,j}$ is an n by n matrix of conditional covariances between the returns of countries i and j . The diagonal

elements, $\sigma_{i,i} = \sigma_i^2$, represent the conditional variance of return on country i (also obtained from the GARCH-M model). The parameter Φ is a measure of the investor's willingness to accept risk in his portfolio. The above one-period utility problem can be written in matrix form as:

$$U = \mathbf{R}'\mathbf{X} - \Phi\mathbf{X}'\mathbf{V}\mathbf{X} \quad \text{III-12}$$

We maximize the objective function (or the portfolio's utility) for an investor whose portfolio is being managed. In general, the portfolio problem for an investor who seeks a higher expected value at some risk is given by equation III-12. Denoting the optimal solution to mean variance efficiency by $X(\Phi) = MV(E[R_i], \sigma, \rho, \Phi)$ for given values of the return vector and variance-covariance matrix, the optimal allocation of available cash among the n countries is determined as a function of the risk aversion parameter, Φ . For a given value of Φ , there is only one efficient portfolio that maximizes utility such that⁷:

$$X(\Phi) = [X_1(\Phi), X_2(\Phi), \dots, X_n(\Phi)] \quad \text{III-13}$$

Equation III-13 gives the portfolio weights obtained by solving the conditional mean-variance problem applied for years 1992 through 1994. Each investor with a given risk

⁷ For further information see Broadie (1993)

aversion parameter is assumed to hold these portfolio weights over the year. At the optimal solution, the expected portfolio return is as follows:

$$R_p(\Phi) = \sum_{i=1}^n X_i(\Phi) E(R_i) \quad \text{III-14}$$

The portfolio variance is then given by:

$$\sigma_p(\Phi) = \sum_{i=1}^n X_i^2(\Phi) \sigma_i^2 + \sum_{i=1}^n \sum_{j=i-1}^n X_i(\Phi) X_j(\Phi) \rho_{i,j} \sigma_i \sigma_j \quad \text{III-15}$$

The efficient frontier curve $(R_p(\Phi), \sigma_p(\Phi))$ is obtained for values of Φ ranging from 0 to 1.5. The $\Phi=1.5$, represents higher degree of risk aversion and the lowest risk portfolio (in this range) and $\Phi=0$ indicates low risk aversion and leads to the maximum return portfolio (in this range). Hence we obtain different optimal efficient portfolios along the efficient frontier for different value, of the risk aversion parameter between 0 and 1.5. A relatively risk tolerant individual who cares primarily to maximize his expected return on the portfolio is represented by low Φ ($\Phi=0$) while a risk averter by high Φ ($\Phi=1.5$).

A standard mean-variance quadratic programming (MV-QP) model is used here, described in Broadie (1993) based on forecasts of risk and return inputs. The decision variables for (MV-QP) are the portfolio country weights. The required parameters for the

(MV-QP) are the estimated means, standard deviations and correlations of the country returns. The (MV-QP) problem is solved using MATLAB. A reference for MATLAB is the publication by the MathWorks (1995). To solve this problem I used the Quadratic Programming Optimization Toolbox. A description of the quadratic programming problem can be found in the Optimization Toolbox User's Guide (1990). The main part of the (MV-QP) is given as follows;

$$x = \text{qp}(\text{cov}, c, A, b, v_l, b, v_u, x, 1)$$

This line tells MATLAB to solve a quadratic program. The program solves the above problem for a single point on the efficient frontier. I estimated two efficient frontiers for three years as shown by charts 1 through 3. Each frontier is plotted for sixteen points, each corresponding to a different risk aversion parameter Φ in the range of 0 to 1.5. The output of the quadratic programming problem is a vector of portfolio weights, together with the portfolio return and standard deviation⁸.

III-6 Results

In this section I present the results when each individual investor is presented with one of the following portfolio choices:

1-Invest in the developed market portfolio only;

⁸ Tables 7 through 22 give the results for each sixteen risk aversion parameter values for the combined markets efficient frontier, while Tables 23 through 38 give the results for the developed markets efficient frontier

2-Invest in the combined portfolio (including emerging markets as well as developed markets) portfolio.

Before proceeding, I analyze the degree of correlation within emerging markets and the degree of correlation between emerging markets and developed markets, based on current and country specific information variables. Later I analyze the allocation choices represented along the two efficient frontiers and compare them by year to identify the benefits of diversifying into emerging markets.

Tables 4 through 6 show cross country return correlations for the years 1992 through 1994 respectively. The highest conditional correlation between emerging markets and developed market returns is 0.7252, between Austria and Argentina in 1992. The lowest conditional correlation is between Spain and Greece, which is equal to -0.7443 for 1992. The correlation values vary among developed and emerging markets. The conditional correlations within emerging markets has a highest value of 0.7306 (between Portugal and Malaysia) and a lowest value of -0.7158 (between Turkey and Portugal) for 1992. The highest value of correlation within developed markets for that year is between Italy and New Zealand, which equals to 0.7384.

For 1993 the highest value of conditional correlation coefficient within emerging markets is 0.9571 (between Mexico and Greece), while the minimum correlation coefficient is -0.6671 (between Columbia and Taiwan). New Zealand has the highest

correlation coefficient with Switzerland (0.8568) within the developed markets, while the lowest correlation is -0.7844 (between Canada and Switzerland) for that year. Similar analysis is observed for 1994 from Table 4.

Charts 1 through 3 show the efficient frontiers for the years 1992 through 1994. Each curve plots the conditional expected return and volatility as an annualized percent. As expected the efficient frontier obtained by inclusion of both developed markets and emerging markets always lies above the frontier for developed markets alone, indicating benefits of diversification into the emerging markets.

Tables 7 through 22 give the portfolio weights for investors who invest both in emerging and developed markets. Along the frontiers are target points, that maximize an investor's expected utility, $R_p - \Phi\sigma_p^2$, for a given value of Φ .⁹ The benefits of diversifying into emerging markets can be seen by inspecting these tables. The expected return and corresponding standard deviations of target points are given at the end of each table for each year. When we compare the utility maximizing choices of individuals with risk aversion parameter measures between 0 and 1.5 (given by tables 7 and 22) we observe the following: Table 7 shows an optimal portfolio selection with annual return of 130% and a corresponding standard deviation of 117% for a very risk tolerant investor ($\Phi=0$) in 1992; at the other extreme, Table 22 gives a portfolio with 43% annual return and only 2% standard deviation for a risk averse individual ($\Phi=1.5$) for that year. The

⁹ This is given by Broadie (1993)

risk tolerant individual chooses to invest 100% of his funds in the maximum expected return portfolio in emerging markets while the risk averse investor would allocate approximately 80% of his funds into emerging markets in 1992. Thus in this particular year, even the investor who is risk averse can improve his/her return /risk profile by including emerging markets in his portfolio. Similar analysis can be drawn for all the years under investigation. In 1993 the risk averse individual with $\Phi = 1.5$ would maximize his utility by investing 47.28% of his funds into emerging markets (see Table 22). The same individual would allocate 33.16% of his funds into emerging markets in year 1994. Clearly, there is a time variation depending on market movements.

Tables 23 through 38 give the portfolio weights, expected returns and standard deviations for investor (with different risk aversion parameters) in developed markets.

The above efficient frontiers were obtained capitalizing on the predictive power of current country specific information variables. These estimates include only a portion of past information variables to predict returns for next period. Inclusion of additional information variables may of course increase the predictive power of the estimates.

The investment opportunity set faced by the investor (with a given degree of risk aversion) appears to vary from year to year. An inspection of time varying mean standard deviation plots (given by charts 1 through 3) and portfolio weights (given by tables 7 through 38) suggests the following:

1. The return-to-volatility ratio can be improved by diversifying into emerging markets, which shift the frontier to the left.
2. On average, the conditional volatilities of the emerging markets estimated by the GARCH-M process are much higher than those for the developed markets. This is a commonly accepted empirical observation by both investors and professionals in the field. These higher volatilities are of course typically accompanied by higher expected returns in emerging markets.
3. For a given volatility level, it is possible to obtain higher expected returns by extending investment across emerging markets.

IV- MEASURING THE COSTS FROM NOT DIVERSIFYING INTO EMERGING MARKETS: A CERTAINTY - EQUIVALENT APPROACH

An investor may be interested in knowing the cost of not being able to diversify into emerging markets. One way to measure this, is to compare the expected monetary value (certainty monetary equivalent) of a combined portfolio and the developed market portfolio for a given risk aversion parameter. The certainty equivalent is a dollar amount, for certain that give the same utility as the portfolio's outcome. The difference between the certainty equivalent of the two investment alternatives at each level of investor risk aversion parameter may provide a dollar measure of the cost of not diversifying in emerging markets. In order to compute the certainty equivalent amounts, I rely on a

framework of single period expected utility analysis introduced by Arrow (1964) and applied to portfolio analysis by Levy and Sarnat (1983).¹⁰ In this framework, a certainty equivalent amount for a portfolio is obtained by subtracting the risk premium from the expected value of that portfolio. The expected value of the portfolio is defined as the terminal wealth and the risk premium is defined as an amount that an investor is willing to pay in order to get rid of his portfolio's risk.

Following Levy and Sarnat (1983),¹¹ consider an individual investor with initial wealth W_0 at the beginning of the year facing an uncertain outcome for his investment W_1 at the end of the year. This individual will have an expected terminal wealth of $W_1 = (1 + R_p)W_0$ say highest wealth with $W_1 + \sigma_p$ and a lowest $W_1 - \sigma_p$ at the end of the period. The R_p and σ_p are the portfolio return (%) and standard deviation for that year. In order to obtain an amount of the risk premium for a portfolio, assume that return realizations (high and low outcomes) are occurring with an equal probability of 0.5, how much would an investor be willing to pay in order to get rid of his portfolio's risk? An answer to this question involves the degree of investor's aversion for risk. If the investor is risk neutral, he will be indifferent to such a fair outcome. However, if the investor is risk averse, he will reject it. In order to induce the risk averse investor to accept such an outcome, the probability of getting the favorable result ($W_1 + \sigma_p$) must be increased from 0.5 to some level $p > 0.5$ (see Arrow, 1964) until the investor becomes just indifferent.

¹⁰ For further details see Levy and Sarnat (1983), pp.148-161

¹¹ The derivation of certainty equivalent measures in this section is given in pages 158-159.

The amount $(p - 0.5)$ measures how much one should increase the probability of the favorable outcome in order to make the risk averse investor just indifferent. The more risk averse the investor is, the greater the $(p - 0.5)$. This probability spread is used as an indicator of the risk premium that a risk averse investor is willing to pay to get rid of his portfolio's risk.

In order to determine the amount of the risk premium, the two events described above can be represented in terms of the utility they provide as $U(W_1 + \sigma_p)$ and $U(W_1 - \sigma_p)$. Levy and Sarnat (1983) expand $U(W_1 + \sigma_p)$ and $U(W_1 - \sigma_p)$ in a Taylor series around the given terminal wealth W_1 to obtain:¹²

$$U(W_1 + \sigma_p) = U(W_1) + U'(W_1)\sigma_p + \frac{1}{2!}U''(W_1)\sigma_p^2 + \dots$$

and

$$U(W_1 - \sigma_p) = U(W_1) - U'(W_1)\sigma_p + \frac{1}{2!}U''(W_1)\sigma_p^2 - \dots$$

Using only the first three terms of the Taylor series approximation and multiplying the two expressions by the respective probabilities of the two outcomes, the following expression is obtained:

$$pU(W_1 + \sigma_p) = pU(W_1) + pU'(W_1)\sigma_p + p\frac{1}{2!}U''(W_1)\sigma_p^2$$

¹² Taylor series around point a; $f(x+a) = f(x) + 1/1! f'(x) a + 1/2! f''(x) a^2 + 1/3! f'''(x) a^3 \dots$

and

$$(1-p)U'(W_1 - \sigma_p) = (1-p)U'(W_1) - (1-p)U''(W_1)\sigma_p + (1-p)\frac{1}{2!}U'''(W_1)\sigma_p^2$$

Adding the two equations gives the following:

$$pU'(W_1 + \sigma_p) + (1-p)U'(W_1 - \sigma_p) = U'(W_1) + (2p-1)U''(W_1)\sigma_p + \frac{1}{2!}U'''(W_1)\sigma_p^2$$

The left hand side of the above equation is simply the expected utility of the uncertain outcome. According to Arrow (1964), p has to be increased until the investor is just indifferent to the uncertain outcome. Thus, the expected utility of the investment's outcome (left hand side) is just equal to the utility derived from terminal wealth W_1 . This implies that

$$U(W_1) = pU(W_1 + \sigma_p) + (1-p)U(W_1 - \sigma_p) \quad \text{IV-1}$$

and thus

$$(2p-1)U''(W_1)\sigma_p + \frac{1}{2!}U'''(W_1)\sigma_p^2 = 0 \quad \text{IV-2}$$

Dividing both sides of Equation IV-2 by $2U''(W_1)\sigma_p$ gives¹³:

¹³ Page 159 of Levy and Sarnat (1984).

$$p - \frac{1}{2} = -\frac{\sigma_p U''(W_1)}{4 U'(W_1)} \quad \text{IV-3}$$

$(p - \frac{1}{2})$ is the risk premium measure which can be written as:

$$RP = -\frac{\sigma_p U''(W_1)}{4 U'(W_1)} \quad \text{IV-4}$$

The certainty equivalent is a value that yields the same utility as the expected utility of an uncertain outcome as given below:

$$EU(W_1) = U(W_1 - RP) \quad \text{IV-5}$$

where the expression $(W_1 - RP)$ is the certainty equivalent of the uncertain outcome (W_1) . The investor agrees to convert his risky portfolio to a certain guaranteed amount by paying a risk premium, RP .

For the specific negative exponential utility function used in this study,

$$U(W_1) = 1 - \exp(-kW_1),$$

the first and second derivatives of the above equation are:

$$U'(W_1) = k \exp(-kW_1)$$

and

$$U''(W_1) = -k^2 \exp(-kW_1)$$

The ratio of the derivatives gives:

$$\frac{U''(W_1)}{U'(W_1)} = -k$$

Substituting $-k$ into equation IV-4 for $\frac{U''(W_1)}{U'(W_1)}$, we obtain Arrow's measure of the risk

premium for each investor, as follows:

$$RP \equiv \frac{\sigma_p}{4} k$$

or

$$RP \equiv \Phi \frac{\sigma_p}{2}$$

where $\Phi \equiv \frac{k}{2}$ is the risk aversion parameter used earlier.

The risk premium, RP, gives the dollar amount that an individual is willing to transfer the risk of his portfolio to someone else. This amount is a function of both the investor's risk aversion parameter, Φ , and the risk of the portfolio, σ_p . An investor with risk aversion parameter zero will not pay any risk premium since such investor is considered to be risk tolerant.

Tables 39 through 41 give the expected returns (R_p), risks (σ_p) and the risk premium. RP , for an investor investing in the combined portfolio (for different risk aversion parameters) for the years 1992 through 1994. For comparison purposes, the initial investment (W_0) is assumed to be \$100. Similarly, the expected return, risk and the risk premium for an investor investing on the developed market portfolio (for different risk aversion parameters) is given by tables 42 through 44 for the years 1992 through 1994.

Tables 39 through 41 also give the certainty equivalent measures, CE , of the combined portfolios at different points (corresponding to different risk aversion parameters) on the efficient frontiers for years 1992 through 1994. Similarly, tables 41 through 44 give the certainty equivalent measures of the developed market portfolios at different points (corresponding to different risk aversion parameters) on the efficient frontier for the corresponding years. The certainty equivalent amounts are higher for the combined portfolios than for the developed market portfolios for all risk aversion parameters and all years under investigation.

Table 45 gives the difference between these certainty equivalents (ΔCE). For a given risk aversion parameter, the amount of ΔCE represents the dollar amount that an investor would be willing to pay in order to be on the higher efficient frontier. Thus, it may measure the cost of not diversifying into emerging markets. In cases where the international investor is restricted from investing in emerging markets (e.g., due to

government regulations and control, transaction costs, political risks), the differences in the certainty equivalents may be interpreted as measuring the cost of such obstacles. An examination of the differences in these certainty equivalents, ΔCE , indicates that there is a significant loss of not diversifying into emerging markets for the years 1992 and 1994. The loss is comparatively less significant in 1993.

V- CONCLUSIONS

The standard portfolio optimization requires inputs, namely the expected return and the variance-covariance matrix, that must be forecasted. Techniques that utilize historic averages to forecast future returns may not proper results since past performance is not necessarily the best indicator of the future behavior of market returns. Following Harvey (1994), I propose that information available in the recent past can be used as information variables to better forecast future returns.

Forecasts of returns and the variance-covariance matrix were obtained using current information variables (called conditioning information variables), such as previous month's returns, the price earnings ratio, price-to-book value, and the dividend yield. Thus, implementing the conditional asset allocation strategy, I believe that I have utilized better forecasts of the expected returns, variances and covariances for next period.

In testing the linear regression equation for return forecasts I confirmed the existence of heteroscedasticity in the error terms. When the error term is not constant (time-dependent), an ARCH (GARCH) type of process is better suited for modeling financial time series data.

A univariate GARCH-M model in combination with the above information variables was used to forecast the country returns and variance-covariances employed as inputs in the quadratic programming problem. The quadratic optimization problem was solved to derive efficient portfolio weights as a function of an individual investor's degree of risk aversion for each year during the period 1992-1994. The construction and performance of the efficient frontiers was examined for each of the two investment alternatives (developed markets only versus developed plus emerging markets). In the last section, certainty equivalent measures of the difference in performance among the two alternative investments were derived.

Recent research by Harvey (1994) and Divecha (1992) indicates that average returns in emerging markets are higher than those in developed markets. These high returns combined with low correlations between emerging and developed markets are presumed to create better diversification opportunities for US investors. The results of this study are similar to those obtained by Harvey and Divecha in that investing in emerging markets enhances the reward-to-risk profile by shifting the mean variance efficient portfolio frontier to the left.

This study utilizes the country specific information variables to forecast returns, where the return equation is the mean equation of the univariate GARCH-M model. The information variables include the conditional standard deviation as an independent variable, among others. The coefficients of information variables are estimated by using the maximum likelihood procedure. However, Harvey uses global information variables as well as country specific variables and relies on OLS regression to estimate the parameters of the information variables. This study uses an alternative quadratic programming formulation in which the individual investor's risk aversion preferences are represented. (Harvey solves a quadratic programming problem for a minimum variance portfolio with a given risk level).

Divecha (1992) also solves the quadratic programming problem for a minimum variance portfolio. He uses historic averages of returns and variances as inputs into the portfolio problem. His formulations are again different than those used in this study. The results regarding the diversification benefits are similar to the results of this study. Trevor (1996) uses the variance equation of the univariate GARCH model to formulate risk. This study borrows his approach to formulate the variance-covariance matrix. Trevor's work again uses the average historic returns as return estimates, whereas this study uses recent past information variables to estimate returns.

By examining differences in the certainty equivalents among the emerging markets efficient frontier and the combined markets efficient frontier, I find that there is

a significant loss from not diversifying into emerging markets for years 1992 and 1994: the average ΔCE was \$28 in 1992 and \$12 in 1994 on a \$100 investment. The loss is less significant for the year 1993 (\$5 on the \$100 investment).

APPENDIX A: Tables

TABLE I AKAIKE AND SCHWARTZ LAG TEST RESULTS

ARGENTINA	AKAIKE	SCHWARTZ
1	605.6631	616.1348
2	607.5746	620.1406
3	607.8749	622.5353
4	608.7616	625.5164
5	609.7077	628.5568
6	610.0003	630.9437
7	611.7146	634.7524
8	613.7093	638.8414
9	613.5486	640.7750
10	615.4419	644.7627
11	617.1621	648.5772
12	618.3281	651.8376
BRAZIL		
1	607.6205	618.0923
2	609.5916	622.1577
3	610.8633	625.5237
4	611.6105	628.3652
5	610.4753	629.3244
6	611.8776	632.8210
7	611.4915	634.5293
8	610.6325	635.7646
9	611.9931	639.2196
10	611.7040	641.0249
11	613.0236	644.4388
12	614.9666	648.4761
CHILE		
1	495.0814	505.5532
2	496.5369	509.1030
3	497.8456	512.5060
4	499.8454	516.6002
5	500.5306	519.3797
6	502.0779	523.0213
7	499.2086	522.2464
8	500.8857	526.0179
9	502.8839	530.1103
10	502.9231	532.2439
11	503.6089	535.0240
12	503.2385	536.7480
COLOMBIA		
1	504.3098	514.7815
2	504.6322	517.1983
3	506.5959	521.2564
4	506.9616	523.7163
5	506.4011	525.2502
6	508.1243	529.0677
7	509.9875	533.0253
8	511.2856	536.4178
9	513.2076	540.4341
10	514.9534	544.2742
11	515.9241	547.3392
12	517.9235	551.4330

MEXICO		Table I continued	
1	518.7205	529.1922	
2	520.1063	532.6724	
3	522.1057	536.7661	
4	521.8993	538.6540	
5	523.6963	542.5454	
6	524.1278	545.0712	
7	525.5818	548.6195	
8	527.3837	552.5158	
9	524.7813	552.0077	
10	525.1658	554.4866	
11	524.6006	556.0157	
12	526.4928	560.0023	
VENEZUELA			
1	566.6831	577.1548	
2	568.3234	580.8895	
3	570.3181	584.9785	
4	569.6947	586.4494	
5	569.9841	588.8332	
6	571.9779	592.9213	
7	573.9370	596.9748	
8	575.9255	601.0576	
9	577.9249	603.1514	
10	577.2685	606.5893	
11	576.9406	608.3557	
12	578.8801	612.3896	
KOREA			
1	509.9118	520.3836	
2	511.4633	524.0293	
3	512.2093	526.8697	
4	514.2030	530.9578	
5	514.8019	533.6510	
6	516.6927	537.6361	
7	518.5948	541.6326	
8	519.8481	544.9802	
9	517.5192	544.7457	
10	519.4570	548.7779	
11	520.8897	552.3048	
12	522.6627	556.1722	
PHILIPPINES			
1	525.4167	536.8884	
2	528.3431	540.9091	
3	530.3297	544.9901	
4	532.1805	548.9353	
5	534.1360	552.9851	
6	529.6857	550.6291	
7	531.6188	554.6566	
8	528.8057	553.9378	
9	529.0171	556.2436	
10	531.0169	560.3377	
11	530.7542	562.1693	
12	527.6533	561.1628	

TAIWAN		Table I continued	
1	568.2248	578.6965	
2	569.5593	582.1254	
3	571.4085	586.0689	
4	573.1224	589.8771	
5	574.0991	592.9482	
6	575.7463	596.6898	
7	577.1847	600.2225	
8	577.9307	603.0628	
9	576.8946	604.1211	
10	578.3812	607.7020	
11	580.3735	611.7886	
12	582.1388	615.6483	
INDIA			
1	531.8073	542.2790	
2	533.6793	546.2454	
3	535.6791	550.3395	
4	535.8230	552.5777	
5	534.9237	553.7728	
6	535.6405	556.5840	
7	537.6270	560.6647	
8	538.7365	563.8686	
9	540.6691	567.8956	
10	542.1295	571.4503	
11	543.2324	574.6476	
12	538.9339	572.4434	
MALAYSIA			
1	485.1353	495.6071	
2	484.7357	497.3018	
3	483.9580	498.6184	
4	483.1578	499.9126	
5	483.2724	502.1215	
6	484.3283	505.2717	
7	485.3122	508.3500	
8	485.6905	510.8226	
9	486.5825	513.8090	
10	487.8092	517.1300	
11	489.2145	520.6297	
12	491.2014	524.7109	
THAILAND			
1	530.6229	541.0946	
2	532.3561	544.9221	
3	534.2145	548.8749	
4	534.8574	551.6121	
5	533.2275	552.0766	
6	534.7165	555.6600	
7	536.2708	559.3086	
8	538.0533	563.1854	
9	540.0204	567.2468	
10	539.4503	568.7711	
11	541.1400	572.5552	
12	543.0119	576.5214	

GREECE Table I continued		
1	543.4047	553.8765
2	543.7021	556.2681
3	544.5492	559.2096
4	539.1470	555.9018
5	540.5368	559.3859
6	542.4997	563.4431
7	544.0849	567.1227
8	546.0818	571.2139
9	547.4708	574.6972
10	549.4707	578.7916
11	550.8540	582.2691
12	551.7556	585.2651
PORTUGAL		
1	491.5930	502.0647
2	492.8544	505.4204
3	494.8497	509.5101
4	495.8871	512.6419
5	497.7954	516.6445
6	498.8946	519.8380
7	500.0067	523.0445
8	500.9414	526.0736
9	502.3960	529.6225
10	503.2741	532.5949
11	505.0943	536.5095
12	504.9405	538.4500
TURKEY		
1	615.0564	625.5281
2	617.0387	629.6047
3	619.0012	633.6617
4	620.0310	636.7857
5	621.9724	640.8215
6	623.2270	644.1705
7	622.2459	645.2837
8	623.5935	648.8256
9	621.8590	649.0855
10	623.4304	652.7512
11	624.1052	655.5203
12	625.9534	659.4630
AUSTRALIA		
1	500.88	511.35
2	502.64	515.21
3	504.29	518.95
4	504.86	521.61
5	505.03	523.88
6	504.89	525.83
7	506.17	529.21
8	503.67	528.80
9	505.16	532.39
10	502.97	532.29
11	504.95	536.37
12	506.76	540.27

AUSTRIA		Table I continued	
1	444.93	455.40	
2	446.80	459.36	
3	448.79	463.45	
4	445.15	461.90	
5	447.06	465.91	
6	448.06	469.00	
7	450.03	473.07	
8	450.36	475.50	
9	452.14	479.37	
10	453.92	483.24	
11	454.20	485.61	
12	456.19	489.70	
BELGIUM			
1	426.93	437.40	
2	427.51	440.08	
3	429.48	444.14	
4	430.72	447.48	
5	420.27	439.12	
6	419.37	440.32	
7	416.15	439.18	
8	417.92	443.05	
9	417.57	444.79	
10	419.52	448.84	
11	421.51	452.93	
12	423.17	456.68	
CANADA			
1	411.11	421.58	
2	413.08	425.65	
3	415.07	429.73	
4	410.31	427.07	
5	409.44	428.29	
6	409.33	430.27	
7	409.75	432.79	
8	410.66	435.79	
9	410.10	437.32	
10	411.98	441.30	
11	413.34	444.75	
12	415.33	448.84	
FRANCE			
1	452.76	463.23	
2	445.32	457.88	
3	444.93	459.59	
4	446.67	463.43	
5	443.77	462.62	
6	445.01	465.95	
7	446.37	469.11	
8	445.54	470.68	
9	446.62	473.85	
10	448.28	477.61	
11	450.15	481.57	
12	452.01	485.52	

GERMANY Table I continued

1	464.73	475.21
2	461.12	473.69
3	461.89	476.55
4	463.46	480.21
5	461.44	480.29
6	462.68	483.62
7	463.06	486.10
8	464.84	489.97
9	463.80	491.02
10	465.79	495.12
11	467.51	498.92
12	469.44	502.95

HONG KONG

1	498.50	508.97
2	500.46	513.03
3	501.56	516.22
4	503.25	520.00
5	505.24	524.09
6	502.65	523.59
7	503.49	526.53
8	504.66	529.79
9	506.40	533.62
10	505.56	534.88
11	507.37	538.78
12	508.21	541.72

ITALY

1	491.87	502.35
2	493.17	505.73
3	495.01	509.67
4	496.21	512.97
5	497.54	516.38
6	499.34	520.28
7	500.78	523.82
8	502.02	527.15
9	502.84	530.06
10	503.53	532.85
11	501.67	533.09
12	502.07	535.58

JAPAN

1	502.41	512.88
2	503.96	516.53
3	505.89	520.55
4	507.35	524.10
5	509.28	528.13
6	511.05	531.99
7	512.70	535.74
8	514.17	539.30
9	516.15	543.39
10	518.04	547.37
11	518.19	549.61
12	520.06	553.57

NETHERLANDS Table I continued

1	410.96	421.43
2	410.62	423.19
3	412.52	427.18
4	414.00	430.76
5	413.84	432.69
6	413.06	434.00
7	415.03	438.07
8	416.47	441.60
9	417.18	444.40
10	417.64	446.97
11	418.72	450.13
12	420.72	454.23

NEW ZEALAND

1	481.59	492.16
2	483.34	495.91
3	484.49	499.15
4	485.69	502.45
5	487.47	506.32
6	489.25	510.19
7	491.07	514.11
8	493.07	518.20
9	487.54	514.76
10	489.47	518.79
11	491.44	522.85
12	492.03	525.54

SPAIN

1	482.45	492.92
2	482.27	494.84
3	483.73	498.39
4	485.73	502.48
5	485.79	504.64
6	485.71	506.65
7	487.71	510.74
8	487.94	513.08
9	489.45	516.67
10	491.35	520.67
11	493.35	524.77
12	493.56	527.07

SWITZERLAND

1	445.84	456.31
2	445.17	457.74
3	447.14	461.80
4	447.56	464.41
5	449.65	468.50
6	447.98	468.92
7	449.32	472.33
8	449.28	474.41
9	450.44	477.66
10	452.17	481.49
11	454.13	485.35
12	456.04	489.35

UK Table I continued

1	449.50	459.97
2	445.51	458.08
3	445.27	459.93
4	447.02	463.77
5	448.14	466.99
6	449.91	470.86
7	451.76	474.80
8	453.76	478.89
9	453.15	480.38
10	454.93	484.25
11	456.90	488.31
12	458.55	492.06

USA

1	399.34	409.81
2	400.03	412.59
3	402.02	416.68
4	402.40	419.16
5	402.39	421.24
6	398.82	419.76
7	400.71	423.75
8	401.50	426.63
9	400.87	428.10
10	402.87	432.19
11	404.30	435.71
12	406.14	439.65

TABLE 2. ARCH(1) TEST RESULTS

COUNTRY	CONSTANT	ε_{t-1}^2	T x R ²
Argentina	820.302662	0.09923225	4.826
Brazil	368.625394	0.05340516	20.922
Chile	58.2151453	-0.13229809	31.29
Colombia	54.1634422	0.12361977	16.765
Mexico	79.5149551	-0.1296345	13.949
Venezuela	186.497964	0.00666534	20.628
Korea	61.3389881	0.061816808	20.824
Phillippines	87.1043725	0.064704047	13.464
Taiwan	179.153381	-0.034984	14.813
India	83.7029552	0.161335887	21.782
Malaysia	39.9020117	0.063301758	20.841
Thailand	100.521156	-0.0748842	18.233
Greece	145.538043	-0.0348366	11.218
Portugal	60.6740189	0.032766622	9.462
Turkey	805.287878	-0.0227281	5.025
Australia	18.3303457	0.180317994	28.552
Austria	44.3292103	0.350507263	26.277
Belgium	14.4764089	0.17507227	22.023
Canada	13.0003809	0.033335217	24.634
France	23.4983317	0.155821191	25.817
Germany	26.9562858	0.285078767	20.195
HongKong	56.6567854	0.087328359	17.195
Italy	43.8836954	0.12697527	26.504
Japan	55.9140717	0.061284978	21.928
Netherlands	15.118753	-0.05789314	22.287
NewZealand	41.6557298	0.159430794	25.4
Spain	36.6035351	0.111886773	17.583
Switzerland	22.6468317	0.115245863	19.956
UK	26.4256621	0.050817574	24.229
USA	8.8307944	0.192864573	17.321

$\chi^2(1)$ with 95% Confidence Level =

3.8415

The following equation is estimated:

$$\varepsilon_{t,t} = a_0 + a_1 \varepsilon_{t,t-1}^2$$

where $\varepsilon_{i,t}$ are from OLS.

TABLE 3 GARCH-M RESULTS FOR 1992

Variable	Coeff	Std Error	T-Stat	Signif
ARGENTINA				
1. B0	6.2297347	317.2944784	0.77447	0.43865126
2. B1	-0.2301207	0.3468449	-0.36065	0.71836303
3. B2	-1.4595776	4.7061928	-1.27153	0.20354000
4. B3	4.5983600	4.8489426	2.03932	0.04141794
5. B4	0.0917677	0.0846022	0.81454	0.41533699
6. B5	-0.0136177	9.4321281	-0.76191	0.44611505
7. A0	804.5763978	415.0332444	1.46945	0.14171018
8. A1	0.2561133	0.0975812	0.54034	0.58896149
9. A2	0.1999069	0.2779575	1.58327	0.11335977
BRAZIL				
1. B0	22.6150566	145163.0771	-0.00292	0.99767022
2. B1	-0.0368109	0.4410	-0.09973	0.92056219
3. B2	-0.3599843	0.8117	-0.45045	0.65238352
4. B3	-18.0606442	12.7538	-0.76234	0.44585760
5. B4	-0.0044893	0.0558	-0.11838	0.90576719
6. B5	-0.0242731	5909.0429	0.00302	0.99758847
7. A0	422.2078179	718.9264	0.84229	0.39962433
8. A1	0.1622770	0.4618	0.00322	0.99742810
9. A2	0.0560529	1.2705	-0.00304	0.99757558
CHILE				
1. B0	16.36948672	10.92508016	0.82296	0.41053247
2. B1	0.39433286	0.14256642	2.43073	0.01506825
3. B2	-0.62436403	0.80726590	-0.62615	0.53121405
4. B3	-11.31906766	5.11851908	-1.32016	0.18678043
5. B4	0.77648062	0.71511967	0.51208	0.60859619
6. B5	-0.04114438	0.55105508	0.63210	0.52732339
7. A0	25.06764252	5.54132955	2.17184	0.02986754
8. A1	0.28026674	0.24165642	-1.49460	0.13502005
9. A2	0.17951755	0.14428558	7.54213	0.00000000
COLOMBIA				
1. B0	32.97482492	33.85978853	1.03533	0.30051280
2. B1	0.28877243	0.19225720	1.43324	0.15179029
3. B2	-4.10551176	1.78644656	-2.42886	0.01514642
4. B3	7.57140645	9.07937086	0.99523	0.31962348
5. B4	-1.19696869	0.35841036	-3.64116	0.00027142
6. B5	-0.01349457	2.77125069	-0.06589	0.94746878
7. A0	58.50948337	68.82691654	1.21882	0.22291299
8. A1	0.08810723	0.30912760	0.22600	0.82119981
9. A2	0.07757277	1.11717249	-0.36462	0.71539882
MEXICO				
1. B0	-1.89278782	6.412432076	-0.22461	0.82228270
2. B1	0.14631379	0.137358508	0.90019	0.36802082
3. B2	3.16484111	1.850617561	1.90595	0.05665712
4. B3	2.63837003	4.936332261	0.81718	0.41382763
5. B4	-0.44568640	0.788798582	-0.83959	0.40113914
6. B5	0.02454582	0.883383532	-0.13761	0.89054725
7. A0	27.75754191	0.961140172	4.01463	0.00005954
8. A1	0.34135756	0.085991846	-2.69967	0.00694090
9. A2	0.24013245	0.058336713	20.93770	0.00000000

Table 3 (1992) continued

		AUSTRALIA			
1.	B0	75.87575141	1032.898542	9.29909e-004	0.99925804
2.	B1	0.27263993	0.199272	1.21800	0.22322478
3.	B2	-3.77847260	2.138807	-2.21916	0.02647564
4.	B3	-30.96089356	11.528669	-2.86348	0.00419012
5.	B4	-0.87314046	0.353290	-2.59588	0.00943499
6.	B5	0.01966786	269.295554	0.08100	0.93544449
7.	A0	14.45280163	11.645964	1.14568	0.25192912
8.	A1	0.45078825	0.174690	0.08125	0.93524119
9.	A2	0.36155743	0.665932	0.11274	0.91023775
		AUSTRIA			
1.	B0	-19.67502834	34.05635890	-1.96427	0.04949874
2.	B1	0.27023598	0.22402327	0.47994	0.63126851
3.	B2	10.17979465	11.87352177	2.15228	0.03137566
4.	B3	-5.68984997	10.93954753	0.48541	0.62738220
5.	B4	0.48099245	0.45519428	0.54086	0.58860524
6.	B5	-0.03285429	0.93142677	0.41615	0.67729902
7.	A0	73.24032050	8.74980597	1.40702	0.15942047
8.	A1	0.18861033	0.32852932	0.81070	0.41753745
9.	A2	0.06725481	0.31156620	2.00805	0.04463759
		BELGIUM			
1.	B0	-83.42925366	46.21212471	0.04059	0.96762357
2.	B1	-0.15599449	0.17360763	-0.21081	0.83303264
3.	B2	9.21753018	4.74627043	0.38969	0.69676242
4.	B3	25.28910937	12.54929943	0.48187	0.62989812
5.	B4	-0.05464932	0.65005770	-1.75993	0.07841944
6.	B5	-0.00882238	0.82282963	-1.71363	0.08659727
7.	A0	16.57909064	1.79323315	1.15205	0.24930035
8.	A1	0.47306731	0.18089349	1.18052	0.23779443
9.	A2	0.29841952	0.15837705	4.56995	0.00000488
		CANADA			
1.	B0	-4.020599833	34.01284992	-0.03110	0.97519179
2.	B1	-0.122403965	9.21663011	-0.24647	0.80532142
3.	B2	2.084486640	6.09539730	0.39909	0.68982383
4.	B3	-1.451929602	9.23824574	-0.20948	0.83407599
5.	B4	-0.019633501	0.09017708	-0.15862	0.87396851
6.	B5	-0.001229442	1.26775569	-0.87464	0.38177006
7.	A0	6.263848726	2.01618949	1.21372	0.22485493
8.	A1	0.290990573	0.12699394	0.22843	0.81931187
9.	A2	0.305684291	0.29117399	2.62529	0.00865752
		FRANCE			
1.	B0	17.57639864	79.17947542	0.22538	0.82168500
2.	B1	-0.06970049	0.19008928	-0.22771	0.81987043
3.	B2	-2.61496070	11.77628813	-0.08660	0.93099148
4.	B3	-1.08381479	18.62982329	-0.04685	0.96263434
5.	B4	-0.48206420	0.92541143	-0.56519	0.57194765
6.	B5	-0.00694357	1.68684826	-0.59799	0.54984556
7.	A0	19.04804662	5.37565167	0.84932	0.39570356
8.	A1	0.30980751	0.10119885	0.46138	0.64452587
9.	A2	0.32563791	0.20354283	4.04710	0.00005186

Table 3 (1992) continued

NEW ZEALAND					
1.	B0	33.34674014	57.74199493	0.31238	0.75475370
2.	B1	0.04780169	0.20079021	0.10429	0.91693773
3.	B2	-2.17874536	5.17860967	-0.06069	0.95160859
4.	B3	-20.49571978	28.70882161	-0.48163	0.63006689
5.	B4	0.10309855	0.05396046	2.90761	0.00364203
6.	B5	-0.00448314	1.19320185	-0.44561	0.65587950
7.	A0	18.60232511	24.87599486	0.95942	0.33734936
8.	A1	0.24839132	0.43686110	1.01507	0.31007052
9.	A2	0.44726334	0.55032861	0.18740	0.85135060
SPAIN					
1.	B0	-69.88687158	3.83989601	-15.33317	0.00000000
2.	B1	-0.05389538	0.14663729	0.15390	0.87768530
3.	B2	9.68748393	1.14552994	6.73907	0.00000000
4.	B3	-0.44575922	12.11678635	-0.58643	0.55758574
5.	B4	2.24091727	0.95315908	2.40940	0.01597863
6.	B5	-0.00541917	1.04503608	0.72954	0.46566867
7.	A0	10.34897755	18.56912203	2.72200	0.00648885
8.	A1	0.45706126	0.17648844	1.22989	0.21873950
9.	A2	0.36491153	0.27107772	-2.87301	0.00406575
SWITZERLAND					
1.	B0	-18.62961001	44.77911374	0.04955	0.96048243
2.	B1	0.14865930	0.22532631	0.53234	0.59449042
3.	B2	5.86719658	8.80764376	0.16978	0.86518381
4.	B3	3.05527291	10.40271717	0.11725	0.90666046
5.	B4	0.11742876	1.12522012	-0.35852	0.71995150
6.	B5	-0.01381095	0.35244610	-0.23098	0.81733362
7.	A0	18.08457736	21.21833238	2.01345	0.04406692
8.	A1	0.35762466	0.26332935	0.82239	0.41085374
9.	A2	0.27051077	0.49173832	-1.14305	0.25301710
UK					
1.	B0	23.45990755	42175.40264	-0.00584	0.99534047
2.	B1	0.03307358	0.34478	0.07728	0.93840110
3.	B2	-0.63393580	3.86000	-0.25505	0.79868132
4.	B3	-10.03580457	15.38323	-0.65223	0.51425306
5.	B4	-0.11016343	0.66645	-0.15202	0.87916885
6.	B5	0.00211040	6800.84966	0.00643	0.99486929
7.	A0	15.07760139	21.52855	1.79226	0.07309088
8.	A1	0.19694323	0.08510	0.00667	0.99467552
9.	A2	0.44428509	0.51233	-0.00732	0.99416128
USA					
1.	B0	12.99372904	44.74895876	0.10564	0.91586686
2.	B1	0.01180790	0.26556349	-0.16484	0.86906788
3.	B2	2.37060435	6.82447159	0.64270	0.52041814
4.	B3	-11.01474389	11.02110363	-0.96117	0.33646842
5.	B4	0.23630335	0.27920443	1.08777	0.27669535
6.	B5	-0.03089296	1.37260678	-0.24935	0.80309331
7.	A0	6.52498973	5.03159571	3.03568	0.00239991
8.	A1	0.28278523	0.20793059	1.23093	0.21834835
9.	A2	0.35033890	0.34404004	-1.44241	0.14918789

Table 3 (1992) continued

	VENEZUELA				
1.	B0	-13.4324823	62.5847862	-1.77367	0.07611837
2.	B1	0.3648037	0.2018616	1.88324	0.05966740
3.	B2	7.4208976	6.4394448	1.66183	0.09654595
4.	B3	0.9061307	3.1253357	0.44918	0.65330381
5.	B4	0.1052056	0.4463904	1.29014	0.19700207
6.	B5	-0.0005850	4.4257412	1.52050	0.12838512
7.	A0	118.2849020	76.2520251	3.00761	0.00263313
8.	A1	0.3292330	0.0820337	1.56330	0.11798101
9.	A2	0.2721504	0.2445111	-2.74384	0.00607251
	KOREA				
1.	B0	-0.17466687	11492.87652	-0.05817	0.95361531
2.	B1	-0.20665439	0.18187	-1.81421	0.06964519
3.	B2	3.23243383	2.12107	1.71582	0.08619488
4.	B3	12.33804170	9.49277	0.68977	0.49034042
5.	B4	-0.90594722	0.72692	-0.68232	0.49503774
6.	B5	-0.04081059	1410.39033	0.05806	0.95369840
7.	A0	54.97094902	32.16527	2.12731	0.03339457
8.	A1	0.09786207	0.03955	0.06096	0.95139141
9.	A2	0.09396874	0.63958	-0.06560	0.94769289
	PHILIPPINES				
1.	B0	3.19270892	11277.77780	0.04505	0.96406414
2.	B1	0.39411974	0.17471	2.14290	0.03212075
3.	B2	3.64517497	4.02683	1.42605	0.15385490
4.	B3	-0.69522498	2.05691	-0.07450	0.94061208
5.	B4	-0.16779621	0.28462	-1.26489	0.20591184
6.	B5	-0.02428741	1357.90840	-0.04501	0.96409739
7.	A0	48.62890385	55.66843	-1.23250	0.21776331
8.	A1	0.37710807	0.10786	0.04540	0.96378671
9.	A2	0.20185184	0.72283	5.17772e-004	0.99958688
	TAIWAN				
1.	B0	-13.45775116	27.17135872	-0.50887	0.61084342
2.	B1	0.13759078	0.19608957	0.59300	0.55318171
3.	B2	6.69059517	9.5J904083	0.84082	0.40045014
4.	B3	6.43367349	3.70244181	2.18239	0.02908045
5.	B4	-0.77679221	0.41297153	-1.79286	0.07299569
6.	B5	-0.07080991	1.42859620	-0.51304	0.60792221
7.	A0	67.39612879	29.90754971	1.01684	0.30923115
8.	A1	0.48872590	0.23127633	0.72026	0.47136732
9.	A2	0.18860425	0.35673174	1.81703	0.06921290
	INDIA				
1.	B0	36.70559359	22.23826221	-0.08718	0.93053076
2.	B1	0.15828434	0.18116615	-1.52844	0.12640363
3.	B2	-8.92852062	6.26333841	-0.01828	0.98541672
4.	B3	-1.04052367	2.99873183	1.37965	0.16769458
5.	B4	-0.64530398	0.69315616	-1.65491	0.09794370
6.	B5	-0.03654026	1.53026153	0.92095	0.35707478
7.	A0	55.50531895	29.83351837	2.81612	0.00486077
8.	A1	0.42854472	0.28009285	1.42401	0.15444399
9.	A2	0.16041578	0.34863476	-0.51639	0.60558116

Table 3 (1992) continued

MALAYSIA					
1.	B0	16.73107835	12.69221911	2.18267	0.02905993
2.	B1	-0.16943287	0.16576183	-1.06334	0.28762698
3.	B2	-1.28653071	3.43252936	-1.49665	0.13448487
4.	B3	-6.12929543	4.13787774	-2.24687	0.02464825
5.	B4	0.23155273	0.34109668	0.98782	0.32323913
6.	B5	-0.00447006	0.85429973	1.23389	0.21724567
7.	A0	9.51747759	4.82771586	1.00674	0.31406049
8.	A1	0.40578976	0.24553525	1.17820	0.23871664
9.	A2	0.40127322	0.28163899	2.12214	0.03382621
THAILAND					
1.	B0	13.30392333	7.01294971	2.14759	0.03174671
2.	B1	0.23149265	0.11475604	1.76010	0.07839132
3.	B2	0.00133636	0.89214039	-0.05567	0.95560235
4.	B3	1.26450693	1.98988137	0.34484	0.73021656
5.	B4	-0.94724121	0.65095319	-1.11882	0.26321802
6.	B5	0.00272138	0.40453409	-0.45342	0.65024975
7.	A0	46.74940060	4.66386180	2.50586	0.01221538
8.	A1	0.32764064	0.06380969	-4.70968	0.00000248
9.	A2	0.29506881	0.06673652	18.38060	0.00000000
GREECE					
1.	B0	13.36195516	7389.663337	0.12691	0.89901237
2.	B1	0.04059198	0.228966	1.68209	0.09255136
3.	B2	-0.62645356	1.495567	-0.05988	0.95225223
4.	B3	-6.80071933	2.340819	-2.21787	0.02656404
5.	B4	1.21651633	0.327011	3.25724	0.00112500
6.	B5	-0.01649195	623.904587	-0.12558	0.90006618
7.	A0	64.23303607	41.783100	3.41996	0.00062630
8.	A1	0.29753737	0.073579	0.12555	0.90008528
9.	A2	0.40829833	0.202802	-0.06067	0.95162065
PORTUGAL					
1.	B0	6.90185189	6.23293826	1.89144	0.05856621
2.	B1	-0.10259658	0.08990253	0.09015	0.92817160
3.	B2	-1.02590718	1.26111704	-1.14221	0.25336789
4.	B3	2.98356539	1.96005387	-0.78358	0.43328424
5.	B4	-0.69964136	0.42876481	-0.22638	0.82090684
6.	B5	0.00209997	0.24311593	-2.43598	0.01485142
7.	A0	31.38111443	9.38041637	2.82669	0.00470325
8.	A1	0.40382623	0.22394657	3.57924	0.00034459
9.	A2	0.13176689	0.13054273	-1.04581	0.29564731
TURKEY					
1.	B0	-41.7486516	51.3986867	-0.27552	0.78291747
2.	B1	0.0549630	0.3899037	0.29099	0.77105627
3.	B2	6.7814920	4.7622013	1.07319	0.28318733
4.	B3	7.2992085	6.9013493	0.54795	0.58372579
5.	B4	-0.9085497	1.5218132	-0.44637	0.65533241
6.	B5	-0.0179285	2.0118113	-0.17921	0.85777369
7.	A0	342.5777047	925.9819157	0.49843	0.61818213
8.	A1	0.4605869	0.2111110	-0.21441	0.83022922
9.	A2	0.3838017	0.8489136	0.70898	0.47833872

Table 3 (1992) continued

GERMANY					
1.	B0	72.11455793	110.8575322	0.54840	0.58341881
2.	B1	0.02496489	0.1753267	-0.84145	0.40009591
3.	B2	-9.37655764	16.9216279	-0.53164	0.59497308
4.	B3	-6.48620263	19.0226744	-0.11155	0.91118017
5.	B4	-1.67079133	1.4717391	-1.14050	0.25407716
6.	B5	-0.02041613	0.5123254	0.48810	0.62547595
7.	A0	27.29330011	14.8880460	1.69562	0.08995716
8.	A1	0.30620343	0.4451916	1.74882	0.08032278
9.	A2	0.27873665	0.0856691	-0.96549	0.33429918
HONG KONG					
1.	B0	-114.1762640	282.1036593	-0.07824	0.93763430
2.	B1	0.2055918	0.1931480	0.19611	0.84452235
3.	B2	14.4194326	5.9904027	2.52712	0.01150015
4.	B3	11.7254952	6.6411650	2.03589	0.04176091
5.	B4	2.8094744	1.3873056	2.27114	0.02313823
6.	B5	-0.0696802	49.7079400	-0.37724	0.70599169
7.	A0	27.2894416	11.5698587	2.16935	0.03005586
8.	A1	0.4317563	0.1702028	0.35073	0.72579010
9.	A2	0.3348799	0.2142714	0.41396	0.67890628
ITALY					
1.	B0	-31.47649330	63.51786089	0.22593	0.82125438
2.	B1	0.06114381	0.18189361	1.57920	0.11428999
3.	B2	6.32243688	10.23415161	0.00710	0.99433293
4.	B3	8.33959843	15.52012726	-0.14100	0.88786655
5.	B4	0.09227527	0.77539683	-0.65214	0.51431238
6.	B5	-0.02436303	0.57725468	-1.19623	0.23160488
7.	A0	18.02639187	21.06835327	3.11147	0.00186157
8.	A1	0.23747968	0.10626221	2.49055	0.01275445
9.	A2	0.44868109	0.18118232	-5.36324	0.00000008
JAPAN					
1.	B0	-56.49596200	9.13125497	-6.89787	0.00000000
2.	B1	-0.07897638	0.10630463	-1.80234	0.07149203
3.	B2	57.05988979	9.52850748	3.96274	0.00007409
4.	B3	13.34385284	3.38913785	1.29782	0.19434994
5.	B4	-0.66676321	0.28755407	1.27592	0.20198487
6.	B5	-0.02727949	0.36743805	2.71475	0.00663266
7.	A0	36.65833530	14.28524716	1.39023	0.16445866
8.	A1	0.26165928	0.62180586	1.88966	0.05880282
9.	A2	0.25019147	0.07785113	-1.56722	0.11706363
NETHERLANDS					
1.	B0	20.11512239	30.26037170	0.58603	0.55785427
2.	B1	-0.06013728	0.15547944	0.16592	0.86822206
3.	B2	-1.79471347	3.75641962	-0.33439	0.73808758
4.	B3	-4.24296445	10.18835144	-0.48541	0.62738718
5.	B4	-0.36940635	0.26069217	-1.19517	0.23202202
6.	B5	-0.00758742	1.33537184	-0.02630	0.97901884
7.	A0	7.67360386	8.98004758	2.66901	0.00760751
8.	A1	0.36215620	0.08446513	2.22639	0.02598811
9.	A2	0.26444579	0.26761348	-2.96816	0.00299590

TABLE 3 GARCH-M RESULTS FOR 1993

Variable	Coeff	Std Error	T-Stat	Signif
ARGENTINA				
1. B0	15.4515020	100.6835101	0.19787	0.84314509
2. B1	-0.0365051	0.3583099	-0.07980	0.93639646
3. B2	-4.7495708	3.6233761	-0.70475	0.48096537
4. B3	-4.1674049	6.8987963	-0.64466	0.51915052
5. B4	0.0226601	0.0569969	0.43305	0.66497787
6. B5	0.0426500	1.8653336	-0.04103	0.96726837
7. A0	254.7536749	809.6581537	0.74833	0.45425864
8. A1	0.2924899	0.0145660	-4.39679	0.00001099
9. A2	0.1641278	1.8592768	-0.18128	0.85614388
BRAZIL				
1. B0	6.1550899	22.7069126	0.34031	0.73362151
2. B1	-0.1446117	0.1752030	-1.13876	0.25480470
3. B2	-0.4179226	0.5511771	-0.47239	0.63664636
4. B3	-1.9781582	9.9549463	-0.26360	0.79208472
5. B4	-0.0047638	0.0180629	0.00298	0.99762123
6. B5	-0.0073424	1.1420396	-0.04665	0.96279381
7. A0	219.7658914	139.6324246	4.60802	0.00000407
8. A1	0.3032200	0.0355393	2.53283	0.01131453
9. A2	0.3373958	0.0123047	-81.36313	0.00000000
CHILE				
1. B0	23.89052867	26.75095490	2.01250	0.04416709
2. B1	0.32936899	0.17638103	1.81379	0.06970937
3. B2	-1.19385962	1.60870706	-1.63756	0.10151398
4. B3	-8.53722797	4.16763787	-2.13223	0.03298832
5. B4	-0.00481204	0.63253053	-0.59577	0.55132930
6. B5	-0.02992114	2.32930690	-1.18558	0.23578940
7. A0	22.03027948	14.92318893	0.87176	0.38334018
8. A1	0.33707016	0.20991597	0.86100	0.38923785
9. A2	0.33059536	0.30797738	1.80718	0.07073496
COLOMBIA				
1. B0	10.20659177	25602.16842	-0.01086	0.99133718
2. B1	0.09225590	0.22891	0.36317	0.71647782
3. B2	-2.51303957	1.19482	-2.22989	0.02575502
4. B3	22.39269180	9.35446	2.23417	0.02547216
5. B4	-1.60905074	0.47653	-3.29372	0.00098871
6. B5	-0.01504694	3135.14817	0.01131	0.99097550
7. A0	30.85633496	150.87498	0.42927	0.66772932
8. A1	0.60885975	0.08516	0.01181	0.99057815
9. A2	0.33714081	2.18285	0.01282	0.98977385
MEXICO				
1. B0	-9.44930037	9.79864803	-1.25189	0.21060886
2. B1	0.01287538	0.12580355	1.58522	0.11291662
3. B2	1.20709721	1.92674907	2.93887	0.00329407
4. B3	-4.97098751	4.95928244	1.10984	0.26706795
5. B4	1.56454493	0.72358169	-2.14183	0.03220747
6. B5	0.00662249	0.58102953	2.73265	0.00628272
7. A0	31.11470629	10.20908485	2.43412	0.01492790
8. A1	0.31401647	0.15545310	-2.62104	0.00876625
9. A2	0.26231330	0.13351414	7.75369	0.00000000

Table 3 (1993) continued

NEW ZEALAND								
1.	B0	-11.52279703	36.08649700	-0.14626	0.88371371			
2.	B1	-0.05373774	0.15109050	-0.25320	0.80011748			
3.	B2	0.19875241	3.39950074	-0.07235	0.94232688			
4.	B3	15.64227354	17.19106142	0.74572	0.45583515			
5.	B4	-0.50784817	0.72115145	-0.78905	0.43008169			
6.	B5	-0.00282470	0.61760176	0.08841	0.92955415			
7.	A0	20.81027787	35.72300315	1.80161	0.07160676			
8.	A1	0.31078360	0.18193980	2.11547	0.03438950			
9.	A2	0.29813346	0.39667447	-1.79667	0.07238828			
SPAIN								
1.	B0	-61.61159454	0.10449613	-842.46387	0.00000000			
2.	B1	-0.12984736	0.11633617	-1.37149	0.17022136			
3.	B2	8.47238663	0.35228759	36.55508	0.00000000			
4.	B3	-4.08129254	2.04049070	-3.09941	0.00193905			
5.	B4	2.39956905	0.33209996	8.71928	0.00000000			
6.	B5	-0.03555956	0.48283477	0.20809	0.83515961			
7.	A0	24.70958318	2.71044243	1.83437	0.06659906			
8.	A1	0.57002124	0.05487503	-5.14750	0.00000026			
9.	A2	0.23704338	0.09450001	13.20499	0.00000000			
SWITZERLAND								
1.	B0	-39.99891661	32.10722152	-0.50762	0.61172285			
2.	B1	0.11498372	0.11216871	0.82155	0.41133281			
3.	B2	8.34323596	6.72569779	0.33048	0.74103433			
4.	B3	9.72326647	6.20429254	1.33966	0.18035509			
5.	B4	0.47775634	0.93972697	-0.07708	0.93855595			
6.	B5	0.00349416	0.37096318	0.12891	0.89742932			
7.	A0	18.37066641	11.23599290	4.10759	0.00003998			
8.	A1	0.41763029	0.09386081	1.81711	0.06920055			
9.	A2	0.25636724	0.09900882	-9.89716	0.00000000			
UK								
1.	B0	6.39906205	45.43034783	0.97151	0.33129530			
2.	B1	0.00935818	0.21033380	-0.43631	0.66260900			
3.	B2	-0.46839389	1.39941866	-1.35214	0.17632997			
4.	B3	-2.03008458	14.22659389	-0.77449	0.43863822			
5.	B4	0.06449441	0.37955315	0.39842	0.69031790			
6.	B5	-0.00846764	1.00339289	0.92719	0.35383036			
7.	A0	13.33803500	8.89786557	1.52931	0.12618651			
8.	A1	0.34525775	0.42638470	1.33877	0.18064617			
9.	A2	0.35180616	0.24288896	0.09298	0.92591597			
USA								
1.	B0	-75.17408176	57.93948840	-1.30813	0.19082842			
2.	B1	-0.02187348	0.20658607	-0.40565	0.68499825			
3.	B2	13.25075979	8.95293673	1.60237	0.10907376			
4.	B3	10.67722938	11.58557690	0.87280	0.38277308			
5.	B4	0.53373463	0.34010359	1.45001	0.14705514			
6.	B5	-0.02979361	1.42937792	-0.23484	0.81432946			
7.	A0	9.07639730	4.35797421	3.03865	0.00237638			
8.	A1	0.35864915	0.11824771	1.55748	0.11935698			
9.	A2	0.23331573	0.38671579	-1.38090	0.16731006			

Table 3 (1993) continued

VENEZUELA								
1.	B0	17.38223969	17.2026861	1.01091	0.31206039			
2.	B1	0.36334461	0.1400709	1.70174	0.08880422			
3.	B2	1.56686464	6.5468630	0.20277	0.83931385			
4.	B3	3.15018177	2.5113275	1.38605	0.16573161			
5.	B4	-1.38551986	0.7113740	-1.98489	0.04715670			
6.	B5	-0.01597968	0.3196081	0.53698	0.59127800			
7.	A0	81.14117762	104.3583818	2.10870	0.03497071			
8.	A1	0.46579460	0.1112713	-2.14518	0.03193856			
9.	A2	0.18811148	0.7245088	-0.24603	0.80565674			
KOREA								
1.	B0	16.30553252	14451.09018	-0.02205	0.98240506			
2.	B1	-0.09584457	0.18729	-0.77047	0.44101929			
3.	B2	0.10054764	2.53754	-0.08731	0.93042407			
4.	B3	5.25157045	8.52705	0.37463	0.70793505			
5.	B4	-1.04226367	0.71310	-1.38783	0.16518732			
6.	B5	0.00880519	1730.33014	0.02327	0.98143199			
7.	A0	37.34572492	81.36420	0.88072	0.37846832			
8.	A1	0.42053834	0.09375	0.02404	0.98082196			
9.	A2	0.19813803	1.30530	-0.02360	0.98117347			
PHILIPPINES								
1.	B0	2.81911004	23.87963851	0.41211	0.68025928			
2.	B1	0.34761600	0.26838641	1.18525	0.23591843			
3.	B2	-2.03411513	3.62946223	-0.65047	0.51538881			
4.	B3	-1.83042185	2.15976158	-1.02610	0.30484567			
5.	B4	0.40356347	0.27905220	1.13622	0.25586597			
6.	B5	-0.00339779	1.76487936	-0.21576	0.82917249			
7.	A0	50.83575765	43.43998874	1.07665	0.28163698			
8.	A1	0.37121182	0.05924038	-2.39295	0.01671351			
9.	A2	0.36863611	0.47879167	1.31031	0.19009115			
TAIWAN								
1.	B0	-4.5133585	10314.58751	-0.08814	0.92976784			
2.	B1	0.2629601	0.19391	1.85524	0.06356149			
3.	B2	4.6554160	11.68926	-0.88696	0.37510271			
4.	B3	5.1965208	5.49127	-0.21581	0.82913454			
5.	B4	-0.7255860	0.32840	-2.68948	0.00715642			
6.	B5	-0.0175643	817.78908	0.09178	0.92686887			
7.	A0	122.8731976	97.62182	1.80185	0.07156956			
8.	A1	0.4240774	0.09760	-0.09379	0.92527249			
9.	A2	0.2388133	0.52605	-0.19375	0.84637529			
INDIA								
1.	B0	17.65000737	6275.965363	0.06102	0.95133956			
2.	B1	0.29098153	0.147003	3.16927	0.00152822			
3.	B2	-0.84090371	5.703689	-0.03220	0.97431136			
4.	B3	-2.81947302	3.473123	-0.47319	0.63608092			
5.	B4	-0.17349322	0.556891	-0.37186	0.70999787			
6.	B5	-0.01770852	620.785070	-0.05870	0.95318924			
7.	A0	72.23927247	141.671909	0.77694	0.43719293			
8.	A1	0.42246337	0.047380	0.06023	0.95197506			
9.	A2	0.25278891	1.458855	-0.05582	0.95548487			

Table 3 (1993) continued

AUSTRALIA								
1.	B0	74.31478298	26.16585829	2.13870	0.03245966			
2.	B1	0.08114989	0.18100396	0.59110	0.55445424			
3.	B2	-5.36121265	1.71413107	-2.67235	0.00753215			
4.	B3	-23.43979228	8.05969136	-2.51707	0.01183360			
5.	B4	-0.86397700	0.31514823	-2.63606	0.00838748			
6.	B5	-0.02034615	2.33077904	0.84538	0.39789796			
7.	A0	18.99316211	8.24736417	0.96006	0.33702261			
8.	A1	0.15273029	0.26130780	0.63191	0.52744702			
9.	A2	0.31704966	0.29605589	1.71065	0.08714643			
AUSTRIA								
1.	B0	-4.22462891	2.82218567	-2.58486	0.00974191			
2.	B1	0.23149860	0.03476261	6.69557	0.00000000			
3.	B2	3.01697140	1.75168357	0.38563	0.69976842			
4.	B3	-1.92077739	3.75282852	-1.24914	0.21161282			
5.	B4	0.12110565	0.26362600	0.49191	0.62278077			
6.	B5	0.02021324	0.40538933	3.24482	0.00117523			
7.	A0	38.90570206	25.02586524	3.10697	0.00189017			
8.	A1	0.47699769	0.20396024	2.45158	0.01422291			
9.	A2	0.10272717	0.04711157	-21.75527	0.00000000			
BELGIUM								
1.	B0	-62.92994435	47.90296641	-1.01575	0.30975030			
2.	B1	-0.07543850	0.10217795	1.49404	0.13516467			
3.	B2	6.92423244	4.68312129	1.24726	0.21230325			
4.	B3	14.01469158	13.22942199	0.84558	0.39778743			
5.	B4	0.62054861	0.42420848	1.17303	0.24078357			
6.	B5	0.00042804	0.37783192	-1.65629	0.09766398			
7.	A0	12.36727931	5.97575654	2.42527	0.01529683			
8.	A1	0.29811149	0.39655337	1.42608	0.15384386			
9.	A2	0.09354473	0.21054082	-0.99512	0.31967710			
CANADA								
1.	B0	30.30012982	34.98394216	-0.03154	0.97484055			
2.	B1	-0.20738426	0.15871010	-1.81362	0.06973555			
3.	B2	-1.38837799	3.60231832	-0.47360	0.63578626			
4.	B3	-18.32946490	9.01388825	-0.82698	0.40824592			
5.	B4	0.01863438	0.05304892	0.18301	0.85478830			
6.	B5	0.00721772	7.35823603	0.73507	0.46229885			
7.	A0	4.89773550	4.01998854	1.12699	0.25974802			
8.	A1	0.56915192	0.10447004	0.61229	0.54034826			
9.	A2	0.34438368	0.30885833	1.67332	0.09426505			
FRANCE								
1.	B0	-7.36037126	6613.961692	0.03317	0.97353978			
2.	B1	0.01496597	0.222378	-0.06113	0.95125629			
3.	B2	2.01334637	9.960014	0.50628	0.61266313			
4.	B3	-1.24962413	14.363262	0.28487	0.77574523			
5.	B4	0.19264208	0.353528	0.57213	0.56723063			
6.	B5	-0.00679025	1266.531712	-0.03710	0.97040451			
7.	A0	16.97932061	23.576465	1.18951	0.23423882			
8.	A1	0.32440137	0.123531	0.03766	0.96995729			
9.	A2	0.31939250	0.986516	-0.03374	0.97308352			

Table 3 (1993) continued

MALAYSIA					
1.	B0	13.69751504	16.73344429	0.52941	0.59651819
2.	B1	-0.21420462	0.20356806	-0.96062	0.33674271
3.	B2	-4.75471297	3.13783135	-1.48670	0.13709352
4.	B3	-10.34024865	6.53255996	-1.71072	0.08713286
5.	B4	1.25190903	1.01710529	1.31775	0.18758715
6.	B5	-0.03956111	1.20403893	0.74257	0.45774097
7.	A0	13.72301908	13.65116697	0.71066	0.47729299
8.	A1	0.31440516	0.24610298	0.79689	0.42551530
9.	A2	0.40117482	0.40888450	1.47391	0.14050694
THAILAND					
1.	B0	13.08177234	56.04145869	-0.74599	0.45567466
2.	B1	0.11106011	0.20703276	0.42637	0.66984138
3.	B2	-0.84441236	3.36649446	-0.24005	0.81028944
4.	B3	-0.15596099	8.35903387	0.90752	0.36413213
5.	B4	-0.53634413	1.67922768	-1.00434	0.31521663
6.	B5	0.01447908	4.48049995	1.00348	0.31562784
7.	A0	52.76164255	6.73658017	1.88849	0.05896001
8.	A1	0.38089245	0.03967276	-0.73636	0.46150872
9.	A2	0.24548063	0.04555727	20.41076	0.00000000
GREECE					
1.	B0	3.24747839	11071.59871	0.09195	0.92673454
2.	B1	0.01040580	0.28244	0.70120	0.48318115
3.	B2	-0.06536158	1.32542	0.49412	0.62122491
4.	B3	-7.18509703	1.98844	-2.23212	0.02560680
5.	B4	1.58183823	0.26822	4.93941	0.00000078
6.	B5	-0.01052747	1052.28193	-0.09244	0.92634463
7.	A0	69.36452721	19.36814	5.68457	0.00000001
8.	A1	0.22545364	0.06803	0.09250	0.92630207
9.	A2	0.29381980	0.06680	0.02227	0.98223289
PORTUGAL					
1.	B0	17.83600779	12.55338837	1.42878	0.15306720
2.	B1	-0.15776305	0.08906406	-0.51421	0.60710172
3.	B2	-3.06810084	1.78457660	-1.31190	0.18955360
4.	B3	-6.41150927	2.83164655	-1.79780	0.07220856
5.	B4	0.24664448	0.35687326	0.52341	0.60068799
6.	B5	-0.01858233	0.52123822	-1.30551	0.19172086
7.	A0	17.29862501	10.14461415	2.33424	0.01958303
8.	A1	0.35055755	0.47975654	1.69774	0.08955771
9.	A2	0.35846867	0.09831490	-1.20769	0.22716586
TURKEY					
1.	B0	2.1863783	136.9485806	-0.13170	0.89522399
2.	B1	0.2230744	0.2156515	0.66783	0.50424501
3.	B2	0.6552743	3.4721678	0.10673	0.91500555
4.	B3	0.1657175	5.4101136	0.04342	0.96536906
5.	B4	-0.3491745	1.0165853	-0.31906	0.74968301
6.	B5	-0.0068343	6.4276789	0.14747	0.88276233
7.	A0	256.5897827	557.5184284	0.60799	0.54319586
8.	A1	0.3235696	0.0790611	-0.89155	0.37263364
9.	A2	0.3614558	1.2410555	0.26421	0.79161845

Table 3 (1993) continued

GERMANY								
1.	B0	-43.50949838	53.42708197	-0.79991	0.42376121			
2.	B1	-0.01251121	0.10343238	-1.25432	0.20972631			
3.	B2	7.12329157	9.06562072	0.62310	0.53321802			
4.	B3	2.94086287	8.37749718	0.95279	0.34069503			
5.	B4	0.85642513	0.66120647	1.11583	0.26449360			
6.	B5	-0.00308761	0.57681887	-1.49420	0.13512271			
7.	A0	17.18972527	11.44135827	2.46055	0.01387239			
8.	A1	0.43792793	0.46175835	1.69533	0.09001356			
9.	A2	0.16394653	0.23166200	-2.19289	0.02831503			
HONG KONG								
1.	B0	-2.19653665	44.69825748	-0.28961	0.77211435			
2.	B1	-0.07558514	0.12307598	1.34954	0.17716462			
3.	B2	1.42567169	5.56411555	0.44217	0.65836952			
4.	B3	20.27623570	5.76880893	3.66154	0.00025070			
5.	B4	-2.55636737	1.53010676	-1.67564	0.09380796			
6.	B5	-0.03059137	0.36902374	1.82399	0.06815421			
7.	A0	9.90956737	22.80866769	1.58248	0.11354067			
8.	A1	0.56912837	0.28930972	2.13545	0.03272457			
9.	A2	0.43590665	0.51312923	-0.94197	0.34621030			
ITALY								
1.	B0	19.60644276	25.96516515	1.14824	0.25087023			
2.	B1	0.06729678	0.17069667	0.32480	0.74533236			
3.	B2	-1.96266377	4.08328099	-0.44842	0.65384710			
4.	B3	-10.43571484	8.48720475	-1.47571	0.14002245			
5.	B4	-0.00153936	0.02432236	0.19681	0.84397308			
6.	B5	0.01356692	1.39397850	-0.82195	0.41110732			
7.	A0	21.70335452	10.15371433	0.79439	0.42696597			
8.	A1	0.34497250	0.14572535	0.24757	0.80446630			
9.	A2	0.33237954	0.21124790	3.94705	0.00007912			
JAPAN								
1.	B0	-24.88021158	35.37042987	-1.65430	0.09806731			
2.	B1	-0.00518211	0.18699879	0.05141	0.95899813			
3.	B2	29.11647283	7.84019616	3.43393	0.00059490			
4.	B3	1.00557713	1.58565321	1.94460	0.05182317			
5.	B4	-0.02997586	0.05549594	1.06022	0.28904509			
6.	B5	-0.01075987	4.33997318	0.85275	0.39379578			
7.	A0	40.77782083	21.17119970	1.61755	0.10576040			
8.	A1	0.24040350	0.55589590	0.73382	0.46306048			
9.	A2	0.33250575	0.29885584	0.26803	0.78867270			
NETHERLANDS								
1.	B0	27.83758300	4110.975132	0.04755	0.96207664			
2.	B1	-0.11885172	0.178061	-0.28132	0.77846212			
3.	B2	-3.94128215	1.989147	-1.59025	0.11177918			
4.	B3	-3.75820939	2.950632	-1.10440	0.26942085			
5.	B4	-0.29072183	0.281990	-0.87635	0.38083729			
6.	B5	-0.00314590	1301.314258	-0.04239	0.96618455			
7.	A0	8.19875326	3.557185	2.10410	0.03536993			
8.	A1	0.41489993	0.094445	0.04230	0.96625573			
9.	A2	0.29027193	0.546431	-0.04177	0.96668018			

TABLE 3 GARCH-M RESULTS FOR 1994

Variable		Coeff	Std Error	T-Stat	Signif
ARGENTINA					
1.	B0	38.1777857	2126.638396	-0.10045	0.91998380
2.	B1	0.0901495	0.273703	0.63175	0.52755132
3.	B2	-1.7713547	4.185076	-0.49800	0.61848101
4.	B3	-20.7345601	8.314486	-2.23153	0.02564632
5.	B4	0.0062984	0.050259	0.02908	0.97679725
6.	B5	-0.0127295	125.004790	0.11648	0.90727382
7.	A0	115.8447017	208.121785	1.16716	0.24314622
8.	A1	0.3860936	0.062766	-0.10419	0.91701992
9.	A2	0.3564164	0.728831	0.23476	0.81439798
BRAZIL					
1.	B0	0.9129607	52097.00122	-0.00902	0.99280388
2.	B1	0.0543980	0.19558	0.14956	0.88110798
3.	B2	5.3353350	6.13393	0.93966	0.34738959
4.	B3	-4.1929143	10.41371	-0.42129	0.67354005
5.	B4	-0.0043284	0.02612	-0.13874	0.88965951
6.	B5	-0.0032917	3189.23377	0.00905	0.99277818
7.	A0	163.9878679	1177.74487	0.21852	0.82702787
8.	A1	0.3149454	0.12869	0.00939	0.99250624
9.	A2	0.2159740	4.34420	0.00804	0.99358653
CHILE					
1.	B0	32.90449630	26.03755991	1.00773	0.31358207
2.	B1	0.27465130	0.08881079	2.74993	0.00596081
3.	B2	-2.24225917	3.46121150	-0.20215	0.83979653
4.	B3	-11.02927091	5.23645578	-2.86928	0.00411404
5.	B4	0.01465705	0.31847344	1.15160	0.24948470
6.	B5	-0.00278482	0.53082127	0.75349	0.45115690
7.	A0	22.09837000	40.35756298	1.59242	0.11129100
8.	A1	0.23097363	0.14710822	-2.35917	0.01831575
9.	A2	0.35320612	0.70860404	0.38437	0.70070393
COLOMBIA					
1.	B0	15.47346544	32.36873437	0.92784	0.35348855
2.	B1	0.44949361	0.14745126	2.55187	0.01071464
3.	B2	-1.29556309	0.99348385	-1.38897	0.16484337
4.	B3	6.80330262	5.29664651	1.42637	0.15376147
5.	B4	-0.93100362	0.24054862	-3.88942	0.00010048
6.	B5	-0.00581282	4.27396774	-0.45804	0.64692201
7.	A0	54.22364158	48.85119606	0.86744	0.38570149
8.	A1	0.06446868	0.01805214	-3.10603	0.00000033
9.	A2	0.11573570	0.86678668	0.42152	0.67337661
MEXICO					
1.	B0	8.23189338	19.99714518	0.93705	0.34873213
2.	B1	0.30862799	0.18945343	0.65063	0.51528489
3.	B2	4.84590983	3.57280856	1.29731	0.19452534
4.	B3	3.18371028	10.98896721	0.22424	0.82257179
5.	B4	-1.51863679	1.30381999	-0.79447	0.42692340
6.	B5	-0.01273340	2.48119716	-0.67833	0.49756360
7.	A0	45.84240275	35.80248283	1.79126	0.07325136
8.	A1	0.36560132	0.22030459	-1.27275	0.20310680
9.	A2	0.26591673	0.44766880	0.65851	0.51020851

Table 3 (1994) continued

AUSTRALIA					
1.	B0	72.49107120	68.6566043	2.56554	0.01030165
2.	B1	0.01231907	0.1196990	0.37776	0.70560522
3.	B2	-5.58686098	6.6431220	-1.96029	0.04996167
4.	B3	-18.61287659	17.5669498	-2.32022	0.02032914
5.	B4	-1.12753985	0.4342307	-2.74976	0.00596391
6.	B5	-0.01150831	4.0971843	-2.22249	0.02625017
7.	A0	14.62879886	3.9737311	1.33424	0.18212670
8.	A1	0.38313626	0.0269947	-1.15379	0.24858643
9.	A2	0.24720419	0.1857645	4.06377	0.00004829
AUSTRIA					
1.	B0	16.39259000	18.86318180	0.58882	0.55598495
2.	B1	-0.32435887	0.18116819	-1.37790	0.16823353
3.	B2	-3.45655910	6.80653204	-0.46258	0.64366417
4.	B3	-4.75274352	3.75071596	-1.21184	0.22557427
5.	B4	-0.03102166	0.08826905	-0.26642	0.78991569
6.	B5	0.01171807	0.94573622	0.54567	0.58529139
7.	A0	20.79943165	34.17470364	0.79069	0.42912463
8.	A1	0.28671237	0.10646764	-1.04422	0.29638399
9.	A2	0.09561651	1.30725864	0.12929	0.89713056
BEIGIUM					
1.	B0	-37.44834423	426.4181819	0.03914	0.96877757
2.	B1	0.02954369	0.1738345	0.74264	0.45770002
3.	B2	4.00548164	3.8339188	1.21212	0.22546735
4.	B3	8.03007166	11.1716442	0.39638	0.69182759
5.	B4	0.49451119	0.4213944	1.30085	0.19330848
6.	B5	-0.02123171	125.6350527	-0.12787	0.89824797
7.	A0	8.11256156	7.0977469	1.49454	0.13503480
8.	A1	0.15859790	0.2110524	0.12272	0.90232953
9.	A2	0.15592935	0.6117629	0.02105	0.98320525
CANADA					
1.	B0	12.28192134	3.771057374	1.48611	0.13725052
2.	B1	-0.04653345	0.181602678	1.26457	0.20602452
3.	B2	-0.49683055	0.671702070	0.75019	0.45314190
4.	B3	-6.93667576	2.426206207	-2.21331	0.02687640
5.	B4	0.00346855	0.017197876	0.61517	0.53843918
6.	B5	0.00386695	0.347266322	0.72162	0.47053044
7.	A0	6.02051045	4.520804909	1.77108	0.07654751
8.	A1	0.40090017	0.566403925	1.59115	0.11157521
9.	A2	0.16805506	0.278894361	-0.98346	0.32537877
FRANCE					
1.	B0	-34.85002922	19.31058790	-1.18312	0.23676204
2.	B1	-0.02786753	0.23093503	0.19391	0.84624643
3.	B2	6.01501178	3.65925475	1.35724	0.17470563
4.	B3	8.07780498	9.72086308	0.09122	0.92731982
5.	B4	0.15339014	0.19061475	0.77453	0.43861502
6.	B5	0.02995434	0.72667631	0.79981	0.42382214
7.	A0	16.52585046	11.95885698	1.62800	0.10352471
8.	A1	0.38827353	0.22872892	-1.36576	0.17201466
9.	A2	0.02488653	0.49844589	0.87488	0.38163693

Table 3 (1994) continued

NEW ZEALAND					
1.	B0	-12.47295433	16.66912231	-2.00058	0.04543786
2.	B1	-0.12329596	0.10757153	-3.08799	0.00201512
3.	B2	1.48556124	1.69856184	2.51127	0.01202988
4.	B3	0.41073826	3.67782618	1.76961	0.07679150
5.	B4	0.49244880	0.29097450	3.26110	0.00110981
6.	B5	-0.01104022	0.99921062	-1.33220	0.18279537
7.	A0	13.85381503	19.42654448	2.22512	0.02607347
8.	A1	0.32854005	0.31927546	1.39081	0.16428326
9.	A2	0.36512061	0.19353922	-3.57450	0.00035090
SPAIN					
1.	B0	22.49182778	20674.35638	-0.00974	0.99223234
2.	B1	-0.18673045	0.27437	-0.90874	0.36344603
3.	B2	-2.38486089	2.91496	-0.79719	0.42534195
4.	B3	-8.63426303	10.81525	-0.47899	0.63194397
5.	B4	-0.01254569	0.03774	-0.33693	0.73617335
6.	B5	-0.04641105	3307.42487	0.01058	0.99156129
7.	A0	19.71339621	29.77148	1.32344	0.18568894
8.	A1	0.39794948	0.14491	0.01023	0.99184152
9.	A2	0.23996420	0.85931	-0.01131	0.99097431
SWITZERLAND					
1.	B0	4.19671455	73.30292201	0.33654	0.73646003
2.	B1	0.13784949	0.18047851	0.88077	0.37844345
3.	B2	0.66580341	3.55934844	0.16638	0.86785546
4.	B3	4.60705521	5.48218904	0.18947	0.84972521
5.	B4	-0.78685720	0.84274503	0.45404	0.64980230
6.	B5	-0.00784409	20.16125586	-0.45187	0.65136221
7.	A0	14.34389466	5.78826079	1.52581	0.12705693
8.	A1	0.09229576	0.32723624	0.45672	0.64787483
9.	A2	0.09377500	0.32827831	0.61666	0.53745595
UK					
1.	B0	64.93585105	15.43642066	0.97399	0.33006204
2.	B1	-0.13355400	0.08915765	-2.10491	0.03529922
3.	B2	-6.90325066	1.51636181	-2.53460	0.01125769
4.	B3	-16.93759498	1.67009358	-0.98751	0.32339192
5.	B4	0.10482877	0.10338105	2.69994	0.00693521
6.	B5	0.01244421	0.48244280	4.40000	0.00001083
7.	A0	13.18036364	5.93078244	2.86551	0.00416339
8.	A1	0.12900893	0.25170698	2.81915	0.00481512
9.	A2	0.27943440	0.15901336	-3.96161	0.00007445
USA					
1.	B0	-57.93194335	32.58705518	-2.12773	0.03335988
2.	B1	-0.20418224	0.13695288	-1.47034	0.14146877
3.	B2	12.97220204	5.76311283	2.54482	0.01093328
4.	B3	7.65632367	5.46263273	1.83925	0.06587911
5.	B4	0.10056146	0.20539927	0.70953	0.47799447
6.	B5	-0.04863966	1.01513764	-0.16866	0.86606433
7.	A0	4.17912091	3.20392175	1.76545	0.07748867
8.	A1	0.37610879	0.26610329	1.22594	0.22022111
9.	A2	0.31601374	0.35016592	-0.65134	0.51482933

Table 3 (1994) continued

VENEZUELA					
1.	B0	-14.16312759	16.5810255	-0.00763	0.99391591
2.	B1	-0.01980925	0.1657210	-0.46594	0.64126031
3.	B2	6.29917283	4.6976930	0.16500	0.86894409
4.	B3	1.65447299	2.0441696	0.83552	0.40342698
5.	B4	-0.00344372	0.5157482	-0.53355	0.59365081
6.	B5	-0.00034649	0.6774854	-0.04761	0.96202668
7.	A0	83.46660608	82.5428607	2.71989	0.00653033
8.	A1	0.23046139	0.0798720	-2.36585	0.01798880
9.	A2	0.28501997	0.3570614	-1.34685	0.17803015
KOREA					
1.	B0	8.58343136	16729.45827	-0.01406	0.98878464
2.	B1	0.03017581	0.25218	-0.12660	0.89925586
3.	B2	-0.25412278	2.59162	-0.00914	0.99270896
4.	B3	-3.29998337	9.91261	-0.14335	0.88601704
5.	B4	-0.09011079	0.50563	-0.17737	0.85921917
6.	B5	-0.01564117	2116.29911	0.01433	0.98856644
7.	A0	30.99465054	54.98857	1.12312	0.26138732
8.	A1	0.32479833	0.18631	0.01443	0.98848721
9.	A2	0.27968565	0.65823	0.01371	0.98905815
PHILIPPINES					
1.	B0	3.72596719	134.3530768	0.88898	0.37401273
2.	B1	0.09089986	0.2380549	1.01753	0.30890100
3.	B2	4.27318774	4.2056055	2.30117	0.02138191
4.	B3	-2.33815284	3.4220561	-1.90595	0.05665719
5.	B4	0.21062534	0.4684212	1.72412	0.08468623
6.	B5	-0.00783413	16.6018521	-0.85843	0.39065693
7.	A0	76.90069080	26.1919668	3.73213	0.00018987
8.	A1	0.22435317	0.0216798	0.79664	0.42566267
9.	A2	0.18994258	0.2590551	-1.61717	0.10584171
TAIWAN					
1.	B0	51.84241473	9.84073156	5.23851	0.00000016
2.	B1	0.12116942	0.06744418	1.62336	0.10451164
3.	B2	-16.86962733	1.38877224	-15.23795	0.00000000
4.	B3	-4.58411647	1.48185045	-2.18491	0.02889558
5.	B4	-0.73804817	0.52402809	-2.11784	0.03418890
6.	B5	-0.00678851	0.36793263	2.24648	0.02467347
7.	A0	94.83621634	7.47255215	2.57854	0.00992192
8.	A1	0.12854178	0.16379640	-2.66128	0.00778450
9.	A2	0.15530741	0.07635486	16.99589	0.00000000
INDIA					
1.	B0	15.21024745	17.58415632	0.26541	0.79069705
2.	B1	0.30915950	0.20032867	1.27822	0.20117214
3.	B2	5.76284482	5.30614570	1.24460	0.21327787
4.	B3	-4.87698033	2.51951230	-1.52618	0.12696568
5.	B4	0.12993670	0.32215611	0.83561	0.40337396
6.	B5	-0.02478415	1.03565479	-0.03560	0.97159760
7.	A0	59.80361754	35.32235742	1.33078	0.18326083
8.	A1	0.41889541	0.31729665	1.19562	0.23184622
9.	A2	0.06480925	0.55303964	0.26031	0.79462570

Table 3 (1994) continued

MALAYSIA					
1.	B0	44.04581492	15.18464493	3.01432	0.00257559
2.	B1	-0.34055681	0.19090646	-1.62633	0.10388000
3.	B2	-9.98328807	3.80271739	-2.55075	0.01074915
4.	B3	-9.08001340	5.68508535	-1.86585	0.06206298
5.	B4	0.31669061	0.72960429	0.94912	0.34256185
6.	B5	-0.05620966	1.07307270	-1.31186	0.18956805
7.	A0	21.69163877	8.48653440	0.88786	0.37461857
8.	A1	0.24519969	0.23285294	0.71747	0.47308259
9.	A2	0.32840758	0.29804430	2.20552	0.02741738
THAILAND					
1.	B0	-6.82684905	18.6056559	-0.26207	0.79326404
2.	B1	0.05873502	0.1805701	0.61347	0.53956737
3.	B2	8.45521269	5.9733555	0.84539	0.39789315
4.	B3	-6.39742610	5.8631354	-0.57251	0.56697787
5.	B4	0.61444390	1.1015738	-0.00219	0.99824882
6.	B5	-0.03736306	2.2057674	0.35605	0.72180192
7.	A0	58.43097018	41.1909323	3.45062	0.00055930
8.	A1	0.18872653	0.1413791	-0.76335	0.44525280
9.	A2	0.25185058	0.2931700	-1.97413	0.04836740
GREECE					
1.	B0	-0.91694173	14.08416494	3.66939	0.00024313
2.	B1	0.07091084	0.16088458	1.21636	0.22384787
3.	B2	0.20678192	0.57943923	-1.61684	0.10591367
4.	B3	-2.14244100	1.51091548	-1.80126	0.07166115
5.	B4	0.72981799	0.38426220	-0.26528	0.79079669
6.	B5	-0.01619884	1.36355511	-3.88839	0.00010091
7.	A0	52.50848571	27.54446661	3.08875	0.00200998
8.	A1	0.33569103	0.04067102	-2.14202	0.03219202
9.	A2	0.06964876	0.27946523	-1.78256	0.07465808
PORTUGAL					
1.	B0	29.15923479	10.81422130	2.52361	0.01161574
2.	B1	-0.12640915	0.13973648	-0.38107	0.70315053
3.	B2	-4.82693147	1.59873203	-2.42750	0.01520314
4.	B3	-10.02614016	6.70196984	-1.06438	0.28715448
5.	B4	0.23731961	0.31538566	0.42917	0.66780261
6.	B5	-0.01520120	0.34922127	-1.79776	0.07221529
7.	A0	24.75102659	10.29749853	2.38899	0.01689478
8.	A1	0.46232445	0.41112507	2.48952	0.01279144
9.	A2	0.24030578	0.10961604	-0.94631	0.34398795
TURKEY					
1.	B0	5.6422020	71.4364834	0.01548	0.98764921
2.	B1	0.1859714	0.2964759	1.18125	0.23750387
3.	B2	0.8514860	3.6386704	0.16428	0.86951026
4.	B3	-0.8193981	6.9179168	-0.17048	0.86462958
5.	B4	-0.2603715	1.3990903	-0.13007	0.89651342
6.	B5	-0.0070746	3.5418963	0.01752	0.98602480
7.	A0	262.0243927	888.6516509	0.50958	0.61034433
8.	A1	0.3030885	0.0325814	-2.24977	0.02446337
9.	A2	0.3392881	2.0867498	0.03346	0.97331017

Table 3 (1994) continued

GERMANY					
1.	B0	40.84264604	12175.46857	0.02522	0.97987700
2.	B1	-0.16285967	0.36668	-0.60101	0.54783042
3.	B2	-6.11155555	3.85254	-1.09801	0.27219893
4.	B3	-9.04172409	8.26786	-0.55614	0.57811321
5.	B4	-0.10227408	0.07595	-0.99436	0.32004960
6.	B5	-0.01971797	2798.97107	-0.02314	0.98153704
7.	A0	12.74641088	5.09523	3.71093	0.00020650
8.	A1	0.27185688	0.14870	0.02352	0.98123691
9.	A2	0.24648077	0.09738	-0.02159	0.98277871
HONG KONG					
1.	B0	-31.31063994	42.51092791	-0.32920	0.74200385
2.	B1	0.03318656	0.16247222	-0.60556	0.54480423
3.	B2	6.05702546	5.92478096	0.35402	0.72332764
4.	B3	13.17573919	9.32001778	1.72443	0.08463040
5.	B4	-0.93039637	2.30210964	0.08854	0.92944593
6.	B5	-0.00214947	2.646184	-1.50029	0.13354035
7.	A0	26.49629616	2.794421	1.50297	0.13284703
8.	A1	0.55425376	0.21028416	1.58307	0.11340616
9.	A2	0.34922011	0.08792094	7.54112	0.00000000
ITALY					
1.	B0	22.32081276	18.78257697	-0.08345	0.93349745
2.	B1	0.11042289	0.21076431	0.46107	0.64474724
3.	B2	-1.40369439	2.55811662	0.65297	0.51377516
4.	B3	-14.05769845	8.43482745	-0.57657	0.56423084
5.	B4	0.01136092	0.01339496	1.10643	0.26854175
6.	B5	-0.01164440	1.47276877	0.19608	0.84454874
7.	A0	27.93696157	30.27865612	1.76300	0.07790100
8.	A1	0.47518014	0.36054844	0.93367	0.35047440
9.	A2	0.12089030	0.34613124	-0.93092	0.35189691
JAPAN					
1.	B0	4.93100039	10.90219767	0.69448	0.48738388
2.	B1	0.21364045	0.12960113	-1.14246	0.25326460
3.	B2	9.91790642	4.94744090	6.85235	0.00000000
4.	B3	-5.14343385	3.55658226	-2.02369	0.04300225
5.	B4	-0.00185480	0.02971659	-3.57006	0.00035690
6.	B5	0.00182468	0.53273457	-3.80126	0.00014396
7.	A0	19.70403310	3.31165233	2.51172	0.01201440
8.	A1	0.33974290	0.09397419	-3.20849	0.00133433
9.	A2	0.36205651	0.06467110	17.81460	0.00000000
NETHERLANDS					
1.	B0	48.26736451	1.00356816	-7.05211	0.00000000
2.	B1	-0.25889744	0.17126291	0.26977	0.78733923
3.	B2	-5.88981995	0.76522536	3.12681	0.00176714
4.	B3	-10.71030387	2.03082730	7.37518	0.00000000
5.	B4	-0.40138373	0.09790232	-9.60884	0.00000000
6.	B5	0.01738613	2.33094851	-1.46342	0.14335325
7.	A0	8.96422160	1.81491912	7.39147	0.00000000
8.	A1	0.23776074	0.41876565	1.05540	0.29124320
9.	A2	0.26025596	0.10395564	-8.11981	0.00000000

Table 4 Correlation Mat

	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Korea	Philippines	Taiwan	India	Malaysia	Thailand	Greece	Portugal	Turkey	Austra
Argentina	1.0000															
Brazil	0.0928	1.0000														
Chile	-0.3455	-0.2024	1.0000													
Colombia	-0.2179	-0.2025	-0.6858	1.0000												
Mexico	0.2372	-0.1638	0.4714	-0.5014	1.0000											
Venezuela	0.2863	-0.4155	-0.3153	0.2583	0.0300	1.0000										
Korea	-0.2622	0.0263	-0.5488	0.6474	-0.6219	-0.1517	1.0000									
Philippines	-0.4154	-0.2446	0.1940	0.2574	-0.4881	0.2275	0.1107	1.0000								
Taiwan	0.3759	-0.2728	-0.4637	0.5109	0.2859	0.3679	0.0821	-0.2410	1.0000							
India	0.3353	-0.1023	-0.0599	-0.1936	0.4727	0.4207	-0.2597	-0.4040	0.4784	1.0000						
Malaysia	0.1725	0.5685	0.1447	-0.5903	-0.0084	-0.2581	-0.2861	-0.0685	-0.5389	-0.0551	1.0000					
Thailand	0.2429	0.5177	-0.3232	0.1852	-0.2493	-0.2897	0.3362	-0.1517	0.2768	-0.1116	-0.1991	1.0000				
Greece	-0.3595	-0.3995	0.7284	-0.4670	0.0048	-0.0937	-0.3722	0.4447	-0.6962	-0.2769	0.2638	-0.8792	1.0000			
Portugal	0.0150	0.1796	0.5882	-0.7209	0.4577	-0.2120	-0.5710	0.0287	-0.3018	0.2141	0.7306	-0.3900	0.4275	1.0000		
Turkey	-0.0809	0.0364	-0.4344	0.6789	-0.4271	0.0063	0.5534	0.2819	0.0999	-0.4793	-0.4899	0.3295	-0.3078	-0.7158	1.0000	
Australia	-0.1535	-0.4920	0.3443	-0.0998	0.4084	-0.0759	-0.5115	-0.2130	0.0519	-0.0630	-0.1965	-0.5307	0.4019	0.0864	-0.2937	1.0000
Austria	0.7252	-0.2288	-0.2136	-0.1763	0.2635	0.4082	-0.0897	-0.3678	0.4026	0.6951	-0.2079	0.1163	-0.2715	-0.1280	-0.1191	-0.16
Belgium	0.2126	-0.3686	0.4361	-0.3200	0.1364	-0.0425	-0.2861	0.2926	-0.3800	-0.4147	0.0900	-0.3441	0.6290	0.1369	0.1915	0.21
Canada	0.0449	-0.3227	0.0695	0.0787	0.0245	-0.3119	-0.2067	-0.0873	-0.0196	-0.3245	-0.1865	-0.2886	0.2937	-0.0864	0.1229	0.71
France	-0.3147	-0.4583	0.4238	-0.0825	0.1696	0.0488	0.0067	0.1439	0.1826	0.2803	-0.1558	-0.1351	0.2505	0.2189	-0.4889	0.16
Germany	-0.2046	-0.4639	0.4154	-0.2461	0.4995	-0.0999	-0.2289	-0.1700	0.0722	0.4829	-0.1964	-0.5074	0.2970	0.3320	-0.3880	0.46
HongKong	-0.1348	-0.1339	0.3882	-0.0319	0.3432	0.1357	-0.2409	0.5141	0.0494	-0.2015	-0.1156	-0.0790	0.1320	0.2753	0.2229	-0.05
Italy	0.1927	-0.7963	0.1124	0.0829	0.0807	0.3201	0.0854	0.0714	0.1902	-0.0406	-0.3691	-0.2403	0.2966	-0.2528	-0.0343	0.25
Japan	-0.6122	0.3677	0.1367	0.2073	-0.4296	-0.3020	0.2097	0.4799	-0.4088	-0.7091	0.1157	0.2252	0.1239	-0.0876	0.3218	-0.15
Netherlands	-0.0206	0.7896	-0.1186	-0.1153	-0.0499	-0.4252	-0.0616	-0.2806	-0.1964	-0.4132	0.4421	0.4401	-0.3280	0.1123	-0.0058	-0.12
NewZealand	0.4244	-0.6863	0.3751	-0.4400	0.3951	0.2486	-0.3822	-0.1162	0.0771	0.3256	-0.1189	-0.3630	0.4404	0.1723	-0.4232	0.36
Spain	0.5115	0.6177	-0.3909	-0.1282	0.2261	-0.0220	-0.0979	-0.5646	0.3645	0.2856	0.2174	0.6323	-0.7443	0.0433	-0.2030	-0.31
Switzerland	-0.1555	-0.5720	-0.2562	0.5317	-0.4130	0.5818	0.3861	0.4586	0.0686	0.0577	-0.4389	-0.3204	0.1794	-0.5133	0.4291	-0.12
UK	0.3184	-0.2722	-0.0911	-0.0876	-0.1509	0.2301	0.2271	-0.1595	0.1044	0.2739	-0.1280	0.1828	-0.0112	-0.2749	-0.1805	-0.25
USA	-0.0490	0.2639	0.4756	-0.5181	-0.2895	-0.4685	0.0239	0.3045	-0.6055	-0.2890	0.3736	0.3054	0.4111	0.2807	-0.1409	-0.45

Table 4 Correlation Matrix (1992)

	Greece	Portugal	Turkey	Australia	Austria	Belgium	Canada	France	Germany	HongKong	Italy	Japan	Netherlands	NewZealand	Spain	Switzerland	UK	USA	
0	1.0000																		
2	0.4275	1.0000																	
5	-0.3078	-0.7158	1.0000																
7	0.4019	0.0964	-0.2937	1.0000															
3	-0.2715	-0.1280	-0.1191	-0.1884	1.0000														
1	0.6290	0.1369	0.1915	0.2192	0.0552	1.0000													
8	0.2937	-0.0964	0.1229	0.7455	-0.0844	0.4158	1.0000												
1	0.2505	0.2189	-0.4889	0.1063	-0.0612	-0.1686	-0.3032	1.0000											
4	0.2970	0.3320	-0.3880	0.4673	0.2765	0.0061	0.3197	0.2291	1.0000										
0	0.1320	0.2753	0.2229	-0.0568	-0.1973	0.3744	-0.1109	-0.0523	0.0702	1.0000									
3	0.2966	-0.2528	-0.0343	0.2571	0.2821	0.4897	0.1293	0.4572	0.0158	-0.0987	1.0000								
2	0.1239	-0.0876	0.3218	-0.1822	-0.8864	-0.0510	-0.2131	0.0377	-0.5914	0.2274	-0.2526	1.0000							
1	-0.3280	0.1123	-0.0058	-0.1221	-0.5401	-0.2816	-0.1530	-0.3168	-0.5828	-0.0243	-0.5234	0.5815	1.0000						
3	0.4404	0.1723	-0.4232	0.3625	0.8144	0.5261	0.2545	0.3484	0.4345	-0.0626	0.7384	-0.6734	-0.6486	1.0000					
3	-0.7443	0.0433	-0.2030	-0.3143	0.1957	-0.5104	-0.4051	-0.1462	-0.4104	-0.1409	-0.3200	-0.0536	0.8506	-0.2895	1.0000				
6	0.1794	-0.5133	0.4291	-0.1281	0.1783	0.1704	-0.0705	0.1566	-0.0236	-0.0870	0.4763	-0.0586	-0.6942	0.1699	-0.6166	1.0000			
5	-0.0112	-0.2749	-0.1805	-0.2598	0.4985	0.0108	-0.3346	0.4985	-0.1983	-0.5221	0.8640	-0.2527	-0.3271	0.5177	0.0847	0.3730	1.0000		
6	0.4111	0.2807	-0.1409	-0.4021	-0.0588	0.3105	-0.1939	0.1859	-0.2041	-0.0189	0.0068	0.2927	0.0827	0.1332	-0.0822	-0.1753	0.3214	1.0000	

Table 5 Correlation Matrix

	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Korea	Philippines	Taiwan	India	Malaysia	Thailand	Greece	Portugal	Turkey	Australia
Argentina	1.0000															
Brazil	0.3105	1.0000														
Chile	-0.5005	-0.2087	1.0000													
Colombia	-0.6775	-0.1727	0.2785	1.0000												
Mexico	-0.5219	0.0240	0.4183	0.7878	1.0000											
Venezuela	0.1448	0.0882	-0.3221	0.3536	0.2131	1.0000										
Korea	0.6811	0.2881	-0.3353	-0.6328	-0.3284	0.1346	1.0000									
Philippines	-0.0719	0.4482	-0.1840	0.3839	0.5733	0.5370	0.2826	1.0000								
Taiwan	0.4502	-0.1385	-0.4145	-0.6671	-0.5683	0.0467	0.7883	0.0551	1.0000							
India	-0.6722	-0.3508	0.3080	0.7147	0.4328	-0.2589	-0.8175	-0.0845	-0.6251	1.0000						
Malaysia	-0.2304	-0.3058	0.7036	-0.1953	0.1023	-0.5857	-0.0180	-0.2804	0.0808	0.0705	1.0000					
Thailand	-0.1841	0.0887	0.2112	-0.9804	-0.2885	-0.0889	-0.1706	-0.2588	-0.1641	0.0872	-0.2618	1.0000				
Greece	-0.5832	-0.0867	0.4713	0.7815	0.9517	0.0894	-0.3276	0.5183	-0.5259	0.5482	0.1274	-0.1201	1.0000			
Portugal	-0.0806	0.1350	0.1319	-0.1698	0.3388	-0.0539	0.3480	0.4829	0.2610	-0.3440	0.4777	-0.4447	0.2780	1.0000		
Turkey	0.4228	-0.3045	-0.4108	-0.2800	-0.8678	0.1800	0.2537	-0.3631	0.3938	-0.2083	-0.2825	0.1485	-0.8081	-0.4904	1.0000	
Australia	-0.2270	-0.4882	0.4889	-0.2133	-0.1188	-0.5574	-0.2819	-0.4488	0.0434	0.3207	0.5816	0.2977	0.0352	0.0639	-0.1777	1.0000
Austria	0.0367	0.3479	0.0631	0.2884	0.6715	0.2067	0.3238	0.6889	-0.0877	-0.0372	-0.1681	-0.1481	0.6782	0.2832	-0.5039	-0.2714
Belgium	0.4826	0.2895	0.2747	-0.1088	0.1943	0.0958	0.1252	0.0823	-0.2289	-0.1389	0.0325	0.0296	0.1502	-0.0882	-0.1946	0.1374
Canada	0.4362	-0.1933	-0.0150	-0.8378	-0.8749	-0.5134	0.1157	-0.8758	0.2018	-0.1539	0.3397	0.1256	-0.5825	-0.0783	0.4089	0.4944
France	-0.5575	0.0833	0.4808	0.7801	0.7581	0.4105	-0.5115	0.4114	-0.6252	0.3746	0.0873	-0.1189	0.6309	0.1715	-0.5472	-0.1408
Germany	-0.5854	-0.0007	0.4056	0.8162	0.9202	0.2470	-0.5120	0.5320	-0.6197	0.5228	0.1023	-0.2886	0.8479	0.2727	-0.5776	-0.1028
HongKong	-0.3450	0.3408	0.0800	0.5847	0.6397	0.2900	0.0546	0.7158	-0.2332	0.1384	0.0003	-0.3386	0.5737	0.3733	-0.3767	-0.5425
Italy	0.4682	-0.0048	-0.3573	-0.8129	-0.9288	-0.1082	0.0888	-0.8314	0.3399	-0.3310	-0.1563	0.2548	-0.9495	-0.4946	0.6743	0.0472
Japan	0.7583	0.0473	-0.1989	-0.8640	-0.5884	-0.1540	0.7331	-0.1981	0.7250	-0.7462	0.2628	-0.2306	-0.6202	0.2249	0.3754	0.0868
Netherlands	-0.4185	-0.0522	0.2047	0.3839	0.3882	0.0580	-0.5180	0.1975	-0.4014	0.3044	0.3029	-0.3885	0.2728	0.4310	-0.2727	0.0286
NewZealand	-0.1300	0.2042	0.1231	0.8230	0.8428	0.5085	0.0431	0.7482	-0.3251	0.0780	-0.1214	-0.4462	0.7410	0.3177	-0.3796	-0.5177
Spain	-0.0283	-0.1210	0.0073	0.4894	0.5081	0.4017	-0.2636	0.3308	-0.2819	0.1920	0.0824	-0.7347	0.3247	0.2014	-0.1383	-0.2588
Switzerland	-0.3170	0.0835	0.2428	0.7949	0.8846	0.4018	-0.2551	0.5522	-0.5083	0.4179	-0.1948	-0.2163	0.8101	-0.0886	-0.4456	-0.3276
UK	-0.1861	-0.0331	-0.2718	-0.1916	-0.5865	-0.3408	-0.3180	-0.5807	-0.0782	0.1709	-0.2780	0.5347	-0.4789	-0.4488	0.2512	0.1340
USA	-0.3412	0.0024	0.2816	0.8149	0.4820	0.4183	-0.4145	0.2586	-0.5861	0.4845	-0.2166	0.0883	0.4787	-0.4258	0.0721	-0.3723

Table 5 Correlation Matrix (1993)

	Greece	Portugal	Turkey	Australia	Austria	Belgium	Canada	France	Germany	HongKong	Italy	Japan	Netherlands	NewZealand	Spain	Switzerland	UK	USA
10	1.0000																	
11	0.2760	1.0000																
15	-0.8091	-0.4904	1.0000															
7	0.0352	0.0639	-0.1777	1.0000														
11	0.6792	0.2832	-0.5039	-0.2714	1.0000													
16	0.1502	-0.0682	-0.1946	0.1374	0.4142	1.0000												
16	-0.5825	-0.0763	0.4069	0.4944	-0.5922	0.0582	1.0000											
19	0.6308	0.1715	-0.5472	-0.1406	0.1966	0.0827	-0.5424	1.0000										
16	0.8479	0.2727	-0.5776	-0.1028	0.4276	0.1526	-0.6533	0.6194	1.0000									
16	0.5737	0.3733	-0.3767	-0.5425	0.4820	-0.2275	-0.5774	0.6175	0.5680	1.0000								
18	-0.9495	-0.4946	0.6743	0.0472	-0.7663	-0.0692	0.5718	-0.5626	-0.7568	-0.6669	1.0000							
16	-0.6202	0.2249	0.3754	0.0868	-0.1333	0.2849	0.4773	-0.6589	-0.5964	-0.4725	0.4992	1.0000						
15	0.2728	0.4310	-0.2727	0.0286	-0.2658	-0.1516	-0.0889	0.5872	0.6445	0.2868	-0.2253	-0.2811	1.0000					
12	0.7410	0.3177	-0.3796	-0.5177	0.7386	0.2892	-0.7193	0.6125	0.7823	0.7063	-0.7680	-0.2959	0.2820	1.0000				
17	0.3247	0.2014	-0.1383	-0.2588	0.0772	0.2120	-0.3149	0.5469	0.6728	0.3038	-0.2868	-0.0865	0.6801	0.6303	1.0000			
13	0.8101	-0.0666	-0.4466	-0.3276	0.7146	0.3282	-0.7844	0.6519	0.7914	0.5677	-0.7321	-0.5483	0.0918	0.8568	0.4859	1.0000		
17	-0.4799	-0.4498	0.2512	0.1340	-0.5897	-0.5477	0.3820	-0.3524	-0.5340	-0.3436	0.5306	-0.2517	-0.1967	-0.7639	-0.6307	-0.5683	1.0000	
13	0.4797	-0.4259	0.0721	-0.3723	0.1838	0.1470	-0.5130	0.6316	0.5976	0.4721	-0.2833	-0.5707	0.2001	0.5686	0.4218	0.7193	-0.2777	1.0000

Table 6 Correlation Ma

	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	Korea	Philippines	Taiwan	India	Malaysia	Thailand	Greece	Portugal	Turkey	Aus
Argentina	1.0000															
Brazil	-0.1820	1.0000														
Chile	-0.1130	0.9911	1.0000													
Colombia	-0.4548	-0.4157	-0.0008	1.0000												
Mexico	0.4111	0.5402	0.6739	-0.4411	1.0000											
Venezuela	0.6762	0.1255	-0.1299	-0.6042	0.4164	1.0000										
Korea	-0.0526	0.2186	0.7566	0.3824	0.5032	-0.3498	1.0000									
Philippines	0.3939	0.2800	0.5616	-0.0171	0.6737	0.1819	0.6983	1.0000								
Taiwan	0.6693	-0.3454	0.1022	-0.0512	0.1793	0.0372	0.2054	0.2137	1.0000							
India	0.2737	0.5163	0.4914	-0.0775	0.4932	0.3713	0.2071	0.3626	0.1297	1.0000						
Malaysia	-0.3931	-0.3383	-0.3908	0.2573	-0.4399	-0.4273	-0.2927	-0.7303	-0.0661	-0.3350	1.0000					
Thailand	0.4474	-0.0594	-0.0520	-0.6204	0.3585	0.2379	0.0409	0.0447	0.2826	-0.3514	0.0542	1.0000				
Greece	-0.4705	-0.0151	0.1052	0.5911	-0.2573	-0.1109	0.2259	-0.0221	-0.5797	-0.0079	-0.0613	-0.4448	1.0000			
Portugal	0.1831	-0.3286	0.1365	-0.2315	0.3361	0.1666	0.1148	0.1636	0.1103	-0.2617	-0.0643	0.5117	-0.2016	1.0000		
Turkey	0.5586	0.2489	0.0669	-0.7346	0.4012	0.2713	-0.1086	0.0186	0.5752	0.1367	-0.0272	0.6543	-0.8486	0.0809	1.0000	
Australia	0.6986	-0.1554	-0.3171	-0.6544	0.0571	0.4962	-0.4293	-0.2534	0.5063	0.0371	-0.0351	0.6077	-0.8040	0.1666	0.7714	
Austria	-0.0691	-0.5019	-0.4646	-0.0475	-0.2351	-0.0292	-0.5057	-0.4856	-0.0182	-0.5532	0.4223	0.0675	-0.2282	0.3466	-0.0664	
Belgium	-0.2844	-0.1475	0.5238	0.5512	0.1575	-0.5667	0.6033	0.3884	0.0521	-0.1036	0.0769	0.0384	0.3741	0.3429	-0.3732	
Canada	0.5872	-0.4688	-0.3907	-0.0979	-0.1181	0.1318	0.0405	0.0747	0.4675	-0.1867	0.0268	0.5958	-0.1911	0.1590	0.3400	
France	-0.5689	0.0756	0.0220	0.3070	-0.2367	-0.5287	0.2134	-0.4102	-0.2638	-0.2402	0.3961	0.0591	0.1750	-0.1237	-0.0658	
Germany	-0.3624	-0.3267	-0.1683	0.6314	-0.4269	-0.3064	-0.0295	-0.3910	-0.0481	0.1283	0.3068	-0.5189	0.1989	-0.1239	-0.3652	
HongKong	-0.1066	0.1718	0.3719	0.3855	0.0788	0.0397	0.3061	0.2906	-0.1932	0.5777	-0.4859	-0.6006	0.5395	-0.1729	-0.5013	
Italy	0.0573	-0.1184	-0.0995	0.4856	0.0297	0.2078	0.0702	0.3693	-0.1454	0.3061	-0.2180	-0.6599	0.3318	-0.2049	-0.5748	
Japan	-0.2873	-0.2395	0.3202	0.7037	-0.1016	-0.2494	0.4673	0.2599	-0.1430	0.1682	-0.0241	-0.4239	0.6906	0.1698	-0.7122	
Netherlands	0.2323	0.0007	-0.5517	-0.4859	-0.1859	0.2526	-0.6181	-0.5141	0.1394	-0.0746	0.2422	0.3073	-0.8202	-0.1668	0.6308	
NewZealand	-0.3399	-0.4449	-0.0720	0.6985	-0.4806	-0.5494	0.4232	0.0686	-0.0659	-0.1617	0.0512	-0.4187	0.5828	-0.1733	-0.6675	
Spain	0.2036	-0.0346	-0.6391	-0.2678	-0.4497	0.2644	-0.5761	-0.2957	-0.0336	-0.1158	-0.1803	0.0022	-0.2219	-0.4296	0.2508	
Switzerland	0.3494	0.6756	0.3768	-0.7033	0.5374	0.5080	-0.1568	0.0888	0.1768	0.6675	-0.2241	0.1293	-0.4333	-0.1464	0.6499	
UK	0.1507	-0.6484	-0.5577	-0.0657	-0.3002	-0.0666	-0.2826	-0.4136	0.3291	-0.6851	0.4925	0.5427	-0.4240	0.3976	0.3042	
USA	0.3001	-0.8384	-0.5176	0.1863	-0.3374	0.1310	-0.1256	-0.1417	0.2165	-0.4414	0.1812	0.3517	0.0741	0.5057	-0.1350	

Table 6 Correlation Matrix (1994)

	Greece	Portugal	Turkey	Australia	Austria	Belgium	Canada	France	Germany	HongKong	Italy	Japan	Netherlands	NewZealand	Spain	Switzerland	UK	USA
30	1.0000																	
17	-0.2018	1.0000																
13	-0.8486	0.0808	1.0000															
77	-0.6040	0.1666	0.7714	1.0000														
15	-0.2282	0.3466	-0.0684	0.0905	1.0000													
14	0.3741	0.3429	-0.3732	-0.5346	-0.2264	1.0000												
18	-0.1911	0.1590	0.3400	0.5896	-0.2440	0.1068	1.0000											
11	0.1750	-0.1237	-0.0688	-0.0855	-0.0380	0.2149	-0.0289	1.0000										
19	0.1989	-0.1239	-0.3652	-0.1145	0.1149	0.0443	-0.1400	0.5591	1.0000									
16	0.5395	-0.1729	-0.5013	-0.2939	-0.3463	0.1822	-0.2615	0.0301	0.4369	1.0000								
9	0.3318	-0.2049	-0.5748	-0.5282	-0.0142	-0.0267	-0.2967	-0.3776	0.2394	0.3882	1.0000							
9	0.6908	0.1698	-0.7122	-0.5954	-0.3403	0.7235	-0.0138	-0.0082	0.3074	0.4863	0.3960	1.0000						
3	-0.8202	-0.1668	0.6308	0.7264	0.2168	-0.7599	0.2281	0.2565	0.1720	-0.4066	-0.3433	-0.7782	1.0000					
7	0.5828	-0.1733	-0.6675	-0.4749	-0.2118	0.5543	0.1919	0.3963	0.5728	0.4289	0.3174	0.6915	-0.4027	1.0000				
2	-0.2219	-0.4296	0.2508	0.4975	-0.0791	-0.7546	0.2914	0.0639	0.1127	-0.1136	-0.0635	-0.5293	0.7396	-0.0422	1.0000			
3	-0.4333	-0.1464	0.6499	0.4197	-0.2953	-0.4907	-0.1894	-0.3247	-0.3627	-0.0337	-0.2215	-0.4153	0.2972	-0.7959	0.0563	1.0000		
7	-0.4240	0.3976	0.3042	0.4252	0.5165	-0.0867	0.4597	0.2215	0.0947	-0.7402	-0.3050	-0.2784	0.4783	-0.0132	0.2075	-0.3651	1.0000	
7	0.0741	0.5057	-0.1350	0.3027	0.1967	0.1814	0.7047	-0.0056	0.1864	-0.2030	-0.0105	0.2968	0.0509	0.3673	0.1082	-0.5633	0.6681	1.0000

TABLE 7
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0

Country	1992	1993	1994
Argentina	100.00%	0.00%	0.00%
Brazil	0.00%	0.00%	0.00%
Chile	0.00%	0.00%	0.00%
Colombia	0.00%	0.00%	100.00%
Mexico	0.00%	0.00%	0.00%
Venezuela	0.00%	0.00%	0.00%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	0.00%	0.00%
Taiwan	0.00%	0.00%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	0.00%	0.00%
Thailand	0.00%	0.00%	0.00%
Greece	0.00%	0.00%	0.00%
Portugal	0.00%	0.00%	0.00%
Turkey	0.00%	0.00%	0.00%
Australia	0.00%	0.00%	0.00%
Austria	0.00%	0.00%	0.00%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	100.00%	0.00%
Italy	0.00%	0.00%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	0.00%
NewZealand	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%
Switzerland	0.00%	0.00%	0.00%
UK	0.00%	0.00%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	117.4215	27.5011	27.9997
Return	130.2515	82.9325	58.1234
			<u>Average</u>
			57.64077
			90.4358

TABLE 8
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.1

Country	1992	1993	1994	
Argentina	8.25%	4.17%	0.00%	
Brazil	11.60%	0.00%	0.00%	
Chile	30.53%	0.00%	17.52%	
Colombia	34.25%	11.40%	38.61%	
Mexico	0.00%	0.00%	0.00%	
Venezuela	0.00%	0.00%	10.00%	
Korea	0.00%	0.00%	0.00%	
Phillippines	0.00%	0.00%	0.00%	
Taiwan	0.00%	0.00%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	28.20%	0.00%	
Thailand	0.00%	9.58%	0.00%	
Greece	15.37%	0.00%	0.00%	
Portugal	0.00%	0.00%	1.80%	
Turkey	0.00%	1.87%	0.00%	
Australia	0.00%	0.00%	0.00%	
Austria	0.00%	0.00%	0.00%	
Belgium	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	35.70%	0.00%	
Italy	0.00%	9.08%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	32.07%	
NewZealand	0.00%	0.00%	0.00%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	0.00%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	7.2799	8.9932	7.2584	<u>Average</u>
Return	61.1406	58.7104	36.6552	<u>7.843833</u>
				52.16873

TABLE 9
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.2

Country	1992	1993	1994	
Argentina	6.97%	6.27%	0.00%	
Brazil	9.03%	0.00%	0.69%	
Chile	35.49%	0.00%	15.17%	
Colombia	37.30%	17.76%	27.43%	
Mexico	0.00%	0.00%	0.00%	
Venezuela	0.00%	0.00%	6.64%	
Korea	0.00%	0.00%	0.00%	
Phillippines	0.00%	4.78%	0.00%	
Taiwan	0.00%	0.00%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	27.06%	0.00%	
Thailand	0.00%	8.96%	0.00%	
Greece	11.21%	0.00%	3.70%	
Portugal	0.00%	0.00%	6.52%	
Turkey	0.00%	0.00%	0.00%	
Australia	0.00%	0.00%	0.00%	
Austria	0.00%	0.00%	0.00%	
Belgium	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	19.08%	0.00%	
Italy	0.00%	16.09%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	39.85%	
NewZealand	0.00%	0.00%	0.00%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	0.00%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	5.367	5.964	5.0363	<u>Average</u> 5.455767
Return	57.9149	52.6277	32.9539	47.83217

TABLE 10
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.3

Country	1992	1993	1994
Argentina	5.67%	5.23%	0.00%
Brazil	8.47%	0.00%	0.09%
Chile	34.88%	0.00%	13.41%
Colombia	37.19%	18.08%	20.65%
Mexico	0.00%	0.00%	0.00%
Venezuela	0.00%	0.00%	4.05%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	5.90%	1.60%
Taiwan	0.00%	0.00%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	25.94%	0.00%
Thailand	0.00%	7.53%	0.00%
Greece	10.33%	0.00%	7.15%
Portugal	0.00%	0.00%	6.87%
Turkey	0.00%	0.00%	0.00%
Australia	0.00%	0.00%	0.00%
Austria	3.46%	4.32%	1.33%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	12.92%	0.00%
Italy	0.00%	20.08%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	42.50%
NewZealand	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%
Switzerland	0.00%	0.00%	2.35%
UK	0.00%	0.00%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	4.5325	4.916	4.1275
Return	55.8730	49.7863	30.8408
			Average
			4.525333
			45.50003

TABLE 11
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.4

Country	1992	1993	1994	
Argentina	4.83%	4.49%	0.00%	
Brazil	8.26%	0.00%	0.00%	
Chile	34.08%	0.00%	7.14%	
Colombia	36.88%	17.91%	17.07%	
Mexico	0.00%	0.00%	0.00%	
Venezuela	0.00%	0.00%	1.01%	
Korea	0.00%	0.00%	0.00%	
Phillippines	0.00%	6.11%	3.86%	
Taiwan	0.00%	0.34%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	24.68%	0.00%	
Thailand	0.00%	5.70%	0.00%	
Greece	9.99%	0.00%	9.87%	
Portugal	0.00%	0.00%	7.49%	
Turkey	0.00%	0.00%	0.30%	
Australia	0.00%	0.00%	0.00%	
Austria	5.96%	7.85%	3.78%	
Belgium	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	8.68%	0.00%	
Italy	0.00%	20.68%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	37.80%	
NewZealand	0.00%	0.00%	0.00%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	11.68%	
UK	0.00%	3.56%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	4.116	4.0098	3.157	Average 3.760933
Return	54.6380	46.9547	28.4132	43.3353

TABLE 12
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.5

Country	1992	1993	1994
Argentina	4.30%	4.46%	0.00%
Brazil	8.14%	0.00%	0.00%
Chile	33.38%	0.00%	4.06%
Colombia	36.69%	17.94%	15.84%
Mexico	0.15%	0.00%	0.00%
Venezuela	0.00%	0.00%	0.00%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	6.85%	4.84%
Taiwan	0.00%	0.52%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	24.21%	0.00%
Thailand	0.00%	4.30%	0.00%
Greece	9.87%	0.00%	11.60%
Portugal	0.00%	0.00%	7.50%
Turkey	0.00%	0.00%	0.97%
Australia	0.00%	0.00%	0.00%
Austria	7.47%	9.08%	5.65%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	5.26%	0.00%
Italy	0.00%	19.26%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	34.17%
NewZealand	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%
Switzerland	0.00%	0.00%	15.37%
UK	0.00%	8.12%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	3.8955	3.3281	2.6747
Return	53.8477	44.7316	27.1821
			Average
			3.299433
			41.92047

TABLE 13
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.6

Country	1992	1993	1994
Argentina	3.78%	4.44%	0.00%
Brazil	8.21%	0.00%	0.07%
Chile	30.47%	0.00%	2.81%
Colombia	36.50%	17.95%	15.59%
Mexico	1.92%	0.00%	0.00%
Venezuela	0.00%	0.00%	0.00%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	7.33%	5.18%
Taiwan	0.00%	0.64%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	23.88%	0.00%
Thailand	0.00%	3.37%	0.00%
Greece	10.63%	0.00%	12.35%
Portugal	0.00%	0.00%	7.27%
Turkey	0.00%	0.00%	1.48%
Australia	0.00%	0.00%	0.00%
Austria	8.49%	9.91%	7.02%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	3.00%	0.00%
Italy	0.00%	18.31%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	31.88%
NewZealand	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%
Switzerland	0.00%	0.00%	16.35%
UK	0.00%	11.17%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	3.6356	2.8912	2.4721
Return	52.7800	43.2495	26.6124
			Average
			2.999633
			40.88063

TABLE 14
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.7

Country	1992	1993	1994
Argentina	3.40%	4.36%	0.00%
Brazil	8.28%	0.00%	0.62%
Chile	28.40%	0.00%	0.72%
Colombia	36.36%	17.75%	16.30%
Mexico	3.18%	0.00%	0.00%
Venezuela	0.00%	0.16%	0.00%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	7.61%	5.34%
Taiwan	0.00%	0.67%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	23.74%	0.00%
Thailand	0.00%	2.65%	0.00%
Greece	11.17%	0.00%	13.02%
Portugal	0.00%	0.00%	7.72%
Turkey	0.00%	0.00%	2.19%
Australia	0.00%	0.00%	0.00%
Austria	9.21%	10.60%	8.11%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	1.38%	0.00%
Italy	0.00%	17.62%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	28.78%
NewZealand	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%
Switzerland	0.00%	0.00%	17.20%
UK	0.00%	13.46%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	3.4695	2.5779	2.3171
Return	52.0173	42.1391	26.1329
			Average
			2.788167
			40.09643

TABLE 15
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.8

Country	1992	1993	1994
Argentina	3.09%	4.08%	0.00%
Brazil	8.35%	0.00%	0.77%
Chile	26.72%	0.00%	0.00%
Colombia	36.17%	16.82%	16.28%
Mexico	4.15%	0.00%	0.00%
Venezuela	0.00%	0.85%	0.00%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	7.57%	5.49%
Taiwan	0.00%	0.50%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	23.98%	0.00%
Thailand	0.00%	1.92%	0.00%
Greece	11.56%	0.00%	13.39%
Portugal	0.00%	0.00%	7.68%
Turkey	0.00%	0.00%	2.49%
Australia	0.00%	0.00%	0.00%
Austria	9.77%	11.49%	8.89%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	0.14%	0.00%
Italy	0.19%	17.04%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	27.48%
NewZealand	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%
Switzerland	0.00%	0.00%	17.53%
UK	0.00%	15.61%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	3.3423	2.298	2.2285
Return	51.3656	41.1200	25.8340
			Average
			2.622933
			39.43987

TABLE 16
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.9

Country	1992	1993	1994	
Argentina	2.65%	3.74%	0.00%	
Brazil	8.67%	0.00%	0.71%	
Chile	24.46%	0.00%	0.00%	
Colombia	35.34%	15.69%	15.88%	
Mexico	5.11%	0.00%	0.00%	
Venezuela	0.00%	1.43%	0.00%	
Korea	0.00%	0.00%	0.00%	
Phillippines	0.00%	7.11%	5.62%	
Taiwan	0.00%	0.33%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	24.00%	0.00%	
Thailand	0.00%	1.43%	0.00%	
Greece	11.77%	0.00%	13.61%	
Portugal	0.00%	0.00%	7.40%	
Turkey	0.00%	0.05%	2.59%	
Australia	0.00%	0.00%	0.00%	
Austria	10.20%	12.45%	9.46%	
Belgium	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	0.00%	0.00%	
Italy	1.80%	16.87%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	27.15%	
NewZealand	0.00%	0.00%	0.00%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	17.58%	
UK	0.00%	16.90%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	3.1314	2.1384	2.177	<u>Average</u> 2.482267
Return	50.2093	40.5213	25.6418	38.7908

TABLE 17
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.0

Country	1992	1993	1994
Argentina	2.25%	3.32%	0.00%
Brazil	8.50%	0.00%	0.66%
Chile	22.43%	0.00%	0.00%
Colombia	34.56%	14.41%	15.56%
Mexico	5.50%	0.00%	0.00%
Venezuela	0.00%	1.99%	0.00%
Korea	0.00%	0.00%	0.00%
Phillippines	0.00%	6.71%	5.73%
Taiwan	0.00%	0.06%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	24.12%	0.00%
Thailand	0.00%	0.96%	0.00%
Greece	12.37%	0.00%	13.79%
Portugal	0.00%	0.00%	7.18%
Turkey	0.00%	0.17%	2.66%
Australia	0.00%	0.00%	0.00%
Austria	10.53%	13.49%	9.92%
Belgium	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	0.00%	0.00%
Italy	2.30%	16.78%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	26.87%
NewZealand	0.00%	0.00%	0.00%
Spain	1.56%	0.00%	0.00%
Switzerland	0.00%	0.00%	17.63%
UK	0.00%	17.99%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	2.8825	2.0171	2.1394
Return	48.7849	40.0436	25.4881
			Average
			2.346333
			38.10553

TABLE 18
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.1

Country	1992	1993	1994	
Argentina	2.04%	3.10%	0.00%	
Brazil	7.99%	0.00%	0.62%	
Chile	20.85%	0.00%	0.00%	
Colombia	33.71%	13.71%	15.30%	
Mexico	5.76%	0.00%	0.00%	
Venezuela	0.00%	2.34%	0.00%	
Korea	0.60%	0.00%	0.00%	
Phillippines	0.00%	6.34%	5.82%	
Taiwan	0.00%	0.00%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	24.09%	0.00%	
Thailand	0.00%	0.67%	0.00%	
Greece	13.16%	0.00%	13.93%	
Portugal	0.00%	0.00%	7.00%	
Turkey	0.00%	0.22%	2.72%	
Australia	0.00%	0.00%	0.00%	
Austria	10.52%	14.12%	10.30%	
Belgium	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	0.00%	0.00%	
Italy	1.72%	16.64%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	26.65%	
NewZealand	0.00%	0.00%	0.00%	
Spain	3.65%	0.00%	0.00%	
Switzerland	0.00%	0.00%	17.66%	
UK	0.00%	18.77%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	2.6333	1.9283	2.1111	Average
Return	47.3437	39.6771	25.3623	2.224233
				37.46103

TABLE 19
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.2

Country	1992	1993	1994	
Argentina	1.88%	2.96%	0.00%	
Brazil	7.53%	0.00%	0.39%	
Chile	19.55%	0.00%	0.00%	
Colombia	32.97%	13.25%	13.93%	
Mexico	5.99%	0.00%	0.00%	
Venezuela	0.00%	2.60%	0.00%	
Korea	1.19%	0.00%	0.00%	
Phillippines	0.00%	6.02%	5.84%	
Taiwan	0.00%	0.00%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	24.02%	0.00%	
Thailand	0.00%	0.46%	0.00%	
Greece	13.84%	0.00%	13.40%	
Portugal	0.00%	0.00%	6.09%	
Turkey	0.00%	0.24%	2.33%	
Australia	0.00%	0.00%	0.00%	
Austria	10.48%	14.57%	10.41%	
Belgium	0.00%	0.00%	2.40%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	0.00%	0.00%	
Italy	1.13%	16.50%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	27.17%	
NewZealand	0.00%	0.00%	0.00%	
Spain	5.44%	0.00%	0.00%	
Switzerland	0.00%	0.00%	18.04%	
UK	0.00%	19.38%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	2.4232	1.8599	2.0091	<u>Average</u>
Return	46.1242	39.3798	24.8745	2.0974 36.79283

TABLE 20
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.3

Country	1992	1993	1994
Argentina	1.74%	2.84%	0.00%
Brazil	7.14%	0.00%	0.12%
Chile	18.45%	0.00%	0.00%
Colombia	32.35%	12.86%	12.29%
Mexico	6.18%	0.00%	0.00%
Venezuela	0.00%	2.81%	0.00%
Korea	1.68%	0.00%	0.00%
Phillippines	0.00%	5.75%	5.84%
Taiwan	0.00%	0.00%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	23.97%	0.00%
Thailand	0.00%	0.28%	0.00%
Greece	14.41%	0.00%	12.68%
Portugal	0.00%	0.00%	5.02%
Turkey	0.00%	0.25%	1.81%
Australia	0.00%	0.00%	0.00%
Austria	10.45%	14.96%	10.43%
Belgium	0.00%	0.00%	5.40%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	0.00%	0.00%
Italy	0.65%	16.38%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	27.91%
NewZealand	0.00%	0.00%	0.00%
Spain	6.95%	0.00%	0.00%
Switzerland	0.00%	0.00%	18.50%
UK	0.00%	19.90%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	2.2461	1.805	1.8921
Return	45.0924	39.1283	24.3048
			<u>Average</u>
			1.981067
			36.17517

TABLE 21
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.4

Country	1992	1993	1994
Argentina	1.62%	2.73%	0.00%
Brazil	6.80%	0.00%	0.00%
Chile	17.50%	0.00%	0.00%
Colombia	31.82%	12.53%	11.17%
Mexico	6.34%	0.00%	0.00%
Venezuela	0.00%	3.00%	0.00%
Korea	2.10%	0.00%	0.00%
Phillippines	0.00%	5.52%	5.82%
Taiwan	0.00%	0.00%	0.00%
India	0.00%	0.00%	0.00%
Malaysia	0.00%	23.92%	0.00%
Thailand	0.00%	0.12%	0.00%
Greece	14.90%	0.00%	12.17%
Portugal	0.00%	0.00%	4.29%
Turkey	0.00%	0.27%	1.47%
Australia	0.00%	0.00%	0.00%
Austria	10.42%	15.28%	10.52%
Belgium	0.00%	0.00%	7.51%
Canada	0.00%	0.00%	0.00%
France	0.00%	0.00%	0.00%
Germany	0.00%	0.00%	0.00%
HongKong	0.00%	0.00%	0.00%
Italy	0.24%	16.28%	0.00%
Japan	0.00%	0.00%	0.00%
Netherlands	0.00%	0.00%	28.39%
NewZealand	0.00%	0.00%	0.00%
Spain	8.26%	0.00%	0.00%
Switzerland	0.00%	0.00%	18.66%
UK	0.00%	20.35%	0.00%
USA	0.00%	0.00%	0.00%
Total	100.00%	100.00%	100.00%
Std. Dev.	2.095	1.7601	1.8109
Return	44.2079	38.9127	23.9007
			Average
			1.888667
			35.67377

TABLE 22
COMBINED PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.5

Country	1992	1993	1994	
Argentina	1.53%	2.63%	0.00%	
Brazil	6.60%	0.00%	0.00%	
Chile	16.68%	0.00%	0.00%	
Colombia	31.34%	12.12%	10.45%	
Mexico	6.36%	0.25%	0.00%	
Venezuela	0.00%	3.14%	0.00%	
Korea	2.33%	0.00%	0.00%	
Phillippines	0.00%	5.33%	5.79%	
Taiwan	0.00%	0.00%	0.00%	
India	0.00%	0.00%	0.00%	
Malaysia	0.00%	23.81%	0.00%	
Thailand	0.00%	0.00%	0.00%	
Greece	15.19%	0.00%	11.82%	
Portugal	0.00%	0.00%	3.84%	
Turkey	0.00%	0.30%	1.26%	
Australia	0.00%	0.00%	0.00%	
Austria	10.31%	15.48%	10.67%	
Belgium	0.00%	0.00%	8.93%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.24%	0.00%	0.00%	
HongKong	0.00%	0.00%	0.00%	
Italy	0.19%	16.23%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	28.69%	
NewZealand	0.00%	0.00%	0.00%	
Spain	9.23%	0.00%	0.00%	
Switzerland	0.00%	0.00%	18.55%	
UK	0.00%	20.71%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
Std. Dev.	1.9616	1.7146	1.7572	Average
Return	43.4244	38.6827	23.6232	1.811133
				35.24343

TABLE 23
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0

Country	1992	1993	1994	
Australia	0.00%	0.00%	0.00%	
Austria	100.00%	0.00%	0.00%	
Belgium	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	0.00%	0.00%	0.00%	
HongKong	0.00%	100.00%	0.00%	
Italy	0.00%	0.00%	0.00%	
Japan	0.00%	0.00%	0.00%	
Netherlands	0.00%	0.00%	0.00%	
NewZealand	0.00%	0.00%	100.00%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	0.00%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
			Average	
Std. Dev.	32.4221	27.5011	22.4468	27.45667
Return	33.2838	82.9325	22.2544	46.1569

TABLE 24
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.1

Country	1992	1993	1994	
Australia	0.00%	15.51%	0.00%	
Austria	45.68%	0.00%	0.55%	
Belgium	0.00%	0.00%	29.86%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	2.94%	0.00%	0.00%	
HongKong	0.00%	56.84%	0.00%	
Italy	0.00%	27.65%	0.00%	
Japan	51.38%	0.00%	8.32%	
Netherlands	0.00%	0.00%	42.83%	
NewZealand	0.00%	0.00%	8.17%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	10.27%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				<u>Average</u>
Std. Dev.	7.3343	10.0546	3.7674	7.0521
Return	31.7361	55.3344	18.4542	35.1749

TABLE 25
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.2

Country	1992	1993	1994	
Australia	0.00%	20.87%	0.00%	
Austria	38.30%	9.79%	8.00%	
Belgium	0.00%	0.00%	24.17%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	13.66%	0.00%	0.00%	
HongKong	0.00%	40.43%	0.00%	
Italy	0.00%	28.91%	0.00%	
Japan	46.88%	0.00%	4.92%	
Netherlands	1.16%	0.00%	27.83%	
NewZealand	0.00%	0.00%	12.98%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	22.10%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
			Average	
Std. Dev.	5.2565	5.9319	2.6283	4.605567
Return	28.1911	46.4750	17.4828	30.7163

TABLE 26
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.3

Country	1992	1993	1994	
Australia	0.00%	22.51%	0.00%	
Austria	34.03%	13.39%	10.49%	
Belgium	0.00%	0.00%	22.28%	
Canada	0.00%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.80%	0.00%	0.00%	
HongKong	0.00%	34.73%	0.00%	
Italy	0.00%	29.37%	0.00%	
Japan	41.24%	0.00%	3.78%	
Netherlands	7.93%	0.00%	22.82%	
NewZealand	0.00%	0.00%	14.59%	
Spain	0.00%	0.00%	0.00%	
Switzerland	0.00%	0.00%	26.04%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	4.309	4.7489	2.3577	3.8052
Return	26.0160	43.4425	17.1590	28.8725

TABLE 27
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.4

Country	1992	1993	1994	
Australia	0.00%	23.09%	0.00%	
Austria	30.78%	15.11%	11.73%	
Belgium	0.00%	0.00%	21.33%	
Canada	2.50%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	17.12%	0.00%	0.00%	
HongKong	0.00%	31.18%	0.00%	
Italy	1.31%	29.38%	0.00%	
Japan	37.16%	0.00%	3.21%	
Netherlands	11.13%	0.00%	20.33%	
NewZealand	0.00%	0.00%	15.39%	
Spain	0.00%	1.24%	0.00%	
Switzerland	0.00%	0.00%	28.01%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				<u>Average</u>
Std. Dev.	3.6107	4.1126	2.2553	3.3262
Return	24.0922	41.4906	16.9972	27.52667

TABLE 28
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.5

Country	1992	1993	1994	
Australia	0.00%	22.43%	0.00%	
Austria	28.27%	15.73%	12.47%	
Belgium	0.00%	0.00%	20.76%	
Canada	4.30%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	17.03%	2.88%	0.00%	
HongKong	0.00%	28.13%	0.00%	
Italy	2.18%	29.65%	0.00%	
Japan	33.89%	0.00%	2.87%	
Netherlands	13.63%	0.00%	18.83%	
NewZealand	0.00%	0.00%	15.87%	
Spain	0.00%	1.18%	0.00%	
Switzerland	0.70%	0.00%	29.20%	
UK	0.00%	0.00%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
			Average	
Std. Dev.	3.1288	3.6537	2.2063	2.996267
Return	22.6353	39.9025	16.9000	26.47927

TABLE 29
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.6

Country	1992	1993	1994	
Australia	0.00%	21.79%	0.00%	
Austria	25.59%	16.23%	12.97%	
Belgium	0.00%	0.00%	20.38%	
Canada	4.78%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.93%	4.43%	0.00%	
HongKong	0.00%	25.82%	0.00%	
Italy	2.48%	29.33%	0.00%	
Japan	30.10%	0.00%	2.64%	
Netherlands	17.11%	0.00%	17.83%	
NewZealand	0.00%	0.00%	16.20%	
Spain	0.00%	1.50%	0.00%	
Switzerland	3.01%	0.00%	29.98%	
UK	0.00%	0.90%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	2.6992	3.3207	2.1793	2.733067
Return	21.2697	38.6233	16.8353	25.5761

TABLE 30
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.7

Country	1992	1993	1994	
Australia	0.00%	21.13%	0.00%	
Austria	23.68%	16.78%	13.05%	
Belgium	0.00%	0.00%	20.72%	
Canada	5.12%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.86%	4.44%	0.00%	
HongKong	0.00%	23.80%	0.00%	
Italy	2.69%	28.15%	0.40%	
Japan	27.39%	0.00%	2.29%	
Netherlands	19.60%	0.00%	17.44%	
NewZealand	0.00%	0.00%	16.02%	
Spain	0.00%	2.57%	0.00%	
Switzerland	4.66%	0.00%	30.08%	
UK	0.00%	3.13%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	2.4033	3.013	2.1363	2.517533
Return	20.2943	37.3638	16.7134	24.7905

TABLE 31
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.8

Country	1992	1993	1994	
Australia	0.00%	20.64%	0.00%	
Austria	22.24%	17.19%	13.16%	
Belgium	0.00%	0.00%	22.25%	
Canada	5.37%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.81%	4.44%	0.00%	
HongKong	0.00%	22.28%	0.00%	
Italy	2.86%	27.27%	0.82%	
Japan	25.35%	0.00%	2.09%	
Netherlands	21.47%	0.00%	16.03%	
NewZealand	0.00%	0.00%	14.82%	
Spain	0.00%	3.36%	1.28%	
Switzerland	5.90%	0.00%	29.55%	
UK	0.00%	4.82%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	2.19	2.7951	1.9894	2.324833
Return	19.5627	36.4192	16.2495	24.07713

TABLE 32
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 0.9

Country	1992	1993	1994	
Australia	0.00%	20.26%	0.00%	
Austria	21.13%	17.51%	13.37%	
Belgium	0.00%	0.00%	24.24%	
Canada	5.57%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.77%	4.45%	0.00%	
HongKong	0.00%	21.10%	0.00%	
Italy	2.98%	26.58%	1.12%	
Japan	23.77%	0.00%	2.04%	
Netherlands	22.92%	0.00%	13.93%	
NewZealand	0.00%	0.00%	13.21%	
Spain	0.00%	3.98%	3.29%	
Switzerland	6.86%	0.00%	28.80%	
UK	0.00%	6.12%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				<u>Average</u>
Std. Dev.	2.0309	2.6354	1.7926	2.152967
Return	18.9937	35.6845	15.6189	23.43237

TABLE 33
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.0

Country	1992	1993	1994	
Australia	0.00%	19.95%	0.00%	
Austria	20.23%	17.77%	13.53%	
Belgium	0.00%	0.00%	25.84%	
Canada	5.73%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.74%	4.45%	0.00%	
HongKong	0.00%	20.16%	0.00%	
Italy	3.08%	26.03%	1.35%	
Japan	22.50%	0.00%	2.00%	
Netherlands	24.09%	0.00%	12.25%	
NewZealand	0.00%	0.00%	11.92%	
Spain	0.00%	4.48%	4.89%	
Switzerland	7.63%	0.00%	28.22%	
UK	0.00%	7.16%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	1.9089	2.515	1.6374	2.020433
Return	18.5385	35.0967	15.1144	22.91653

TABLE 34
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.1

Country	1992	1993	1994	
Australia	0.00%	19.70%	0.00%	
Austria	19.50%	17.98%	13.66%	
Belgium	0.00%	0.00%	27.15%	
Canada	5.86%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.71%	4.46%	0.00%	
HcngKong	0.00%	19.38%	0.00%	
Italy	3.16%	25.59%	1.54%	
Japan	21.47%	0.00%	1.97%	
Netherlands	25.04%	0.00%	10.88%	
NewZealand	0.00%	0.00%	10.85%	
Spain	0.00%	4.87%	6.21%	
Switzerland	8.26%	0.00%	27.74%	
UK	0.00%	8.02%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	1.8134	2.422	1.5123	1.9159
Return	18.1660	34.6158	14.7017	22.4945

TABLE 35
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.2

Country	1992	1993	1994	
Australia	0.00%	19.23%	0.00%	
Austria	18.89%	17.90%	13.78%	
Belgium	0.00%	0.00%	28.24%	
Canada	5.97%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.69%	4.87%	0.00%	
HongKong	0.00%	18.63%	0.00%	
Italy	3.23%	24.83%	1.70%	
Japan	20.61%	0.37%	1.94%	
Netherlands	25.83%	0.03%	9.74%	
NewZealand	0.00%	0.00%	9.97%	
Spain	0.00%	5.07%	7.30%	
Switzerland	8.78%	0.00%	27.33%	
UK	0.00%	9.07%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	1.7373	2.3215	1.4097	1.822833
Return	17.8556	34.0657	14.3577	22.093

TABLE 36
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.3

Country	1992	1993	1994	
Australia	0.00%	18.60%	0.00%	
Austria	18.31%	17.58%	13.87%	
Belgium	0.00%	0.00%	29.16%	
Canada	6.06%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.61%	5.65%	0.00%	
HongKong	0.12%	17.90%	0.00%	
Italy	3.28%	23.83%	1.83%	
Japan	19.74%	1.03%	1.92%	
Netherlands	26.58%	0.00%	8.77%	
NewZealand	0.00%	0.00%	9.23%	
Spain	0.00%	5.13%	8.23%	
Switzerland	9.30%	0.00%	26.99%	
UK	0.00%	10.28%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				<u>Average</u>
Std. Dev.	1.6683	2.2152	1.3244	1.735967
Return	17.5625	33.4636	14.0667	21.6976

TABLE 37
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.4

Country	1992	1993	1994	
Australia	0.00%	18.06%	0.00%	
Austria	17.82%	17.32%	13.95%	
Belgium	0.00%	0.00%	29.95%	
Canada	6.13%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.54%	6.29%	0.00%	
HongKong	0.22%	17.28%	0.00%	
Italy	3.32%	22.97%	1.95%	
Japan	18.99%	1.59%	1.90%	
Netherlands	27.24%	0.00%	7.94%	
NewZealand	0.00%	0.00%	8.58%	
Spain	0.00%	5.18%	9.03%	
Switzerland	9.74%	0.00%	26.70%	
UK	0.00%	11.31%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	1.6115	2.1273	1.2526	1.6638
Return	17.3113	32.9494	13.8172	21.3593

TABLE 38
DEVELOPED MARKET PORTFOLIO INVESTMENT WEIGHTS
Risk Aversion Factor = 1.5

Country	1992	1993	1994	
Australia	0.00%	17.59%	0.00%	
Austria	17.39%	17.10%	14.02%	
Belgium	0.00%	0.00%	30.63%	
Canada	6.20%	0.00%	0.00%	
France	0.00%	0.00%	0.00%	
Germany	16.48%	6.85%	0.00%	
HongKong	0.30%	16.72%	0.00%	
Italy	3.36%	22.24%	2.05%	
Japan	18.34%	2.08%	1.88%	
Netherlands	27.81%	0.00%	7.22%	
NewZealand	0.00%	0.00%	8.04%	
Spain	0.00%	5.22%	9.71%	
Switzerland	10.12%	0.00%	26.45%	
UK	0.00%	12.20%	0.00%	
USA	0.00%	0.00%	0.00%	
Total	100.00%	100.00%	100.00%	
				Average
Std. Dev.	1.5641	2.0538	1.1915	1.603133
Return	17.0935	32.5037	13.6010	21.06607

TABLE 39 CERTAINTY EQUIVALENT VALUES OF COMBINED PORTFOLIO FOR 1992

$\Phi=k/2$	W_0 (\$)	σ_p (%)	σ_p (\$)	R (%)	$W_1 - \sigma_p$ (\$)	W_1 (\$)	$W_1 + \sigma_p$ (\$)	C.E. (\$)
0	100.00	117.4215	270.36	130.252	-40.11	230.25	500.62	-
0.1	100.00	7.2799	11.73	61.1406	149.41	161.14	172.87	160.71
0.2	100.00	5.367	8.48	57.9149	149.44	157.91	166.39	157.69
0.3	100.00	4.5325	7.06	55.873	148.81	155.87	162.94	155.71
0.4	100.00	4.116	6.36	54.638	148.27	154.64	161.00	154.51
0.5	100.00	3.8955	5.99	53.8477	147.85	153.85	159.84	153.73
0.6	100.00	3.6356	5.55	52.78	147.23	152.78	158.33	152.68
0.7	100.00	3.4695	5.27	52.0173	146.74	152.02	157.29	151.93
0.8	100.00	3.3423	5.06	51.3656	146.31	151.37	156.42	151.28
0.9	100.00	3.1314	4.70	50.2093	145.51	150.21	154.91	150.14
1	100.00	2.8825	4.29	48.7849	144.50	148.78	153.07	148.72
1.1	100.00	2.6333	3.88	47.3437	143.46	147.34	151.22	147.29
1.2	100.00	2.4232	3.54	46.1242	142.58	146.12	149.67	146.08
1.3	100.00	2.2461	3.26	45.0924	141.83	145.09	148.35	145.06
1.4	100.00	2.095	3.02	44.2079	141.19	144.21	147.23	144.18
1.5	100.00	1.9616	2.81	43.4244	140.61	143.42	146.24	143.40

TABLE 40 CERTAINTY EQUIVALENT VALUES OF COMBINED PORTFOLIO FOR 1993

$\Phi=k/2$	W_0 (\$)	σ_p (%)	σ_p (\$)	R (%)	$W_1 - \sigma_p$ (\$)	W_1 (\$)	$W_1 + \sigma_p$ (\$)	C.E. (\$)
0	100.00	27.5011	50.31	82.9325	132.62	182.93	233.24	175.88
0.1	100.00	8.9932	14.27	58.7104	144.44	158.71	172.98	158.07
0.2	100.00	5.964	9.10	52.6277	143.52	152.63	161.73	152.36
0.3	100.00	4.916	7.36	49.7863	142.42	149.79	157.15	149.61
0.4	100.00	4.0098	5.89	46.9547	141.06	146.95	152.85	146.84
0.5	100.00	3.3281	4.82	44.7316	139.91	144.73	149.55	144.65
0.6	100.00	2.8912	4.14	43.2495	139.11	143.25	147.39	143.19
0.7	100.00	2.5779	3.66	42.1391	138.47	142.14	145.80	142.09
0.8	100.00	2.298	3.24	41.12	137.88	141.12	144.36	141.08
0.9	100.00	2.1384	3.00	40.5213	137.52	140.52	143.53	140.49
1	100.00	2.0171	2.82	40.0436	137.22	140.04	142.87	140.02
1.1	100.00	1.9283	2.69	39.6771	136.98	139.68	142.37	139.65
1.2	100.00	1.8599	2.59	39.3798	136.79	139.38	141.97	139.36
1.3	100.00	1.805	2.51	39.1283	136.62	139.13	141.64	139.11
1.4	100.00	1.7601	2.45	38.9127	136.47	138.91	141.36	138.89
1.5	100.00	1.7146	2.38	38.6827	136.30	138.68	141.06	138.66

TABLE 41 CERTAINTY EQUIVALENT VALUES OF COMBINED PORTFOLIO FOR 1994

$\Phi=k/2$	W_0 (\$)	σ_p (%)	σ_p (\$)	R (%)	$W_1 - \sigma_p$ (\$)	W_1 (\$)	$W_1 + \sigma_p$ (\$)	C.E. (\$)
0	100.00	27.9997	44.27	58.1234	113.85	158.12	202.40	151.80
0.1	100.00	7.2584	9.92	36.6552	126.74	136.66	146.57	136.29
0.2	100.00	5.0363	6.70	32.9539	126.26	132.95	139.65	132.79
0.3	100.00	4.1275	5.40	30.8408	125.44	130.84	136.24	130.73
0.4	100.00	3.157	4.05	28.4132	124.36	128.41	132.47	128.35
0.5	100.00	2.6747	3.40	27.1821	123.78	127.18	130.58	127.14
0.6	100.00	2.4721	3.13	26.6124	123.48	126.61	129.74	126.57
0.7	100.00	2.3171	2.92	26.1329	123.21	126.13	129.06	126.10
0.8	100.00	2.2285	2.80	25.834	123.03	125.83	128.64	125.80
0.9	100.00	2.177	2.74	25.6418	122.91	125.64	128.38	125.61
1	100.00	2.1394	2.68	25.4881	122.80	125.49	128.17	125.46
1.1	100.00	2.1111	2.65	25.3623	122.72	125.36	128.01	125.33
1.2	100.00	2.0091	2.51	24.8745	122.37	124.87	127.38	124.85
1.3	100.00	1.8921	2.35	24.3048	121.95	124.30	126.66	124.28
1.4	100.00	1.8109	2.24	23.9007	121.66	123.90	126.14	123.88
1.5	100.00	1.7572	2.17	23.6232	121.45	123.62	125.80	123.60

TABLE 42 CERTAINTY EQUIVALENT VALUES OF DEVELOPED MARKET PORTFOLIO FOR 1992

$\Phi=k/2$	W_0 (\$)	σ_p (%)	σ_p (\$)	R (%)	$W_1 - \sigma_p$ (\$)	W_1 (\$)	$W_1 + \sigma_p$ (\$)	C.E. (\$)
0	100.00	32.4221	43.21	33.2838	90.07	133.28	176.50	126.08
0.1	100.00	7.3343	9.66	31.7361	122.07	131.74	141.40	131.38
0.2	100.00	5.2565	6.74	28.1911	121.45	128.19	134.93	128.01
0.3	100.00	4.309	5.43	26.016	120.59	126.02	131.45	125.90
0.4	100.00	3.6107	4.48	24.0922	119.61	124.09	128.57	124.01
0.5	100.00	3.1288	3.84	22.6353	118.80	122.64	126.47	122.58
0.6	100.00	2.6992	3.27	21.2697	118.00	121.27	124.54	121.23
0.7	100.00	2.4033	2.89	20.2943	117.40	120.29	123.19	120.26
0.8	100.00	2.19	2.62	19.5627	116.94	119.56	122.18	119.53
0.9	100.00	2.0309	2.42	18.9937	116.58	118.99	121.41	118.97
1	100.00	1.9089	2.26	18.5385	116.28	118.54	120.80	118.52
1.1	100.00	1.8134	2.14	18.166	116.02	118.17	120.31	118.15
1.2	100.00	1.7373	2.05	17.8556	115.81	117.86	119.90	117.84
1.3	100.00	1.6683	1.96	17.5625	115.60	117.56	119.52	117.55
1.4	100.00	1.6115	1.89	17.3113	115.42	117.31	119.20	117.30
1.5	100.00	1.5641	1.83	17.0935	115.26	117.09	118.92	117.08

TABLE 43 CERTAINTY EQUIVALENT VALUES OF DEVELOPED MARKET PORTFOLIO FOR 1993

$\Phi=k/2$	W_0 (\$)	σ_p (%)	σ_p (\$)	R (%)	$W_1 - \sigma_p$ (\$)	W_1 (\$)	$W_1 + \sigma_p$ (\$)	C.E. (\$)
0	100.00	27.5011	50.31	82.9325	132.62	182.93	233.24	175.88
0.1	100.00	10.0546	15.62	55.3344	139.72	155.33	170.95	154.55
0.2	100.00	5.9319	8.69	46.475	137.79	146.48	155.16	146.22
0.3	100.00	4.7489	6.81	43.4425	136.63	143.44	150.25	143.28
0.4	100.00	4.1126	5.82	41.4906	135.67	141.49	147.31	141.37
0.5	100.00	3.6537	5.11	39.9025	134.79	139.90	145.01	139.81
0.6	100.00	3.3207	4.60	38.6233	134.02	138.62	143.23	138.55
0.7	100.00	3.013	4.14	37.3638	133.23	137.36	141.50	137.30
0.8	100.00	2.7951	3.81	36.4192	132.61	136.42	140.23	136.37
0.9	100.00	2.6354	3.58	35.6845	132.11	135.68	139.26	135.64
1	100.00	2.515	3.40	35.0967	131.70	135.10	138.49	135.05
1.1	100.00	2.422	3.26	34.6158	131.36	134.62	137.88	134.58
1.2	100.00	2.3215	3.11	34.0657	130.95	134.07	137.18	134.03
1.3	100.00	2.2152	2.96	33.4636	130.51	133.46	136.42	133.43
1.4	100.00	2.1273	2.83	32.9494	130.12	132.95	135.78	132.92
1.5	100.00	2.0538	2.72	32.5037	129.78	132.50	135.23	132.48

TABLE 44 CERTAINTY EQUIVALENT VALUES OF DEVELOPED MARKET PORTFOLIO FOR 1994

$\Phi = k/2$	W_0 (\$)	σ_p (%)	σ_p (\$)	R (%)	$W_1 - \sigma_p$ (\$)	W_1 (\$)	$W_1 + \sigma_p$ (\$)	C.E. (\$)
0	100.00	22.4468	27.44	22.2544	94.81	122.25	149.70	119.13
0.1	100.00	3.7674	4.46	18.4542	113.99	118.45	122.92	118.37
0.2	100.00	2.6283	3.09	17.4828	114.39	117.48	120.57	117.44
0.3	100.00	2.3577	2.76	17.159	114.40	117.16	119.92	117.13
0.4	100.00	2.2553	2.64	16.9972	114.36	117.00	119.64	116.97
0.5	100.00	2.2063	2.58	16.9	114.32	116.90	119.48	116.87
0.6	100.00	2.1793	2.55	16.8353	114.29	116.84	119.38	116.81
0.7	100.00	2.1363	2.49	16.7134	114.22	116.71	119.21	116.69
0.8	100.00	1.9894	2.31	16.2495	113.94	116.25	118.56	116.23
0.9	100.00	1.7926	2.07	15.6189	113.55	115.62	117.69	115.60
1	100.00	1.6374	1.88	15.1144	113.23	115.11	117.00	115.10
1.1	100.00	1.5123	1.73	14.7017	112.97	114.70	116.44	114.69
1.2	100.00	1.4097	1.61	14.3577	112.75	114.36	115.97	114.35
1.3	100.00	1.3244	1.51	14.0667	112.56	114.07	115.58	114.06
1.4	100.00	1.2526	1.43	13.8172	112.39	113.82	115.24	113.81
1.5	100.00	1.1915	1.35	13.601	112.25	113.60	114.95	113.59

TABLE 45 Comparison of Certainty Equivalent Measures of Portfolios

$\Phi=k/2$	1992			1993			1994		
	Combined Portfolio C.E.	Developed Portfolio C.E.	Δ C.E.	Combined Portfolio C.E.	Developed Portfolio C.E.	Δ C.E.	Combined Portfolio C.E.	Developed Portfolio C.E.	Δ C.E.
0	-	126.08	-	175.88	175.88	0.00	151.80	119.13	32.66
0.1	160.71	131.38	29.33	158.07	154.55	3.52	136.29	118.37	17.92
0.2	157.69	128.01	29.67	152.36	146.22	6.14	132.79	117.44	15.34
0.3	155.71	125.90	29.81	149.61	143.28	6.32	130.73	117.13	13.60
0.4	154.51	124.01	30.50	146.84	141.37	5.47	128.35	116.97	11.38
0.5	153.73	122.58	31.16	144.65	139.81	4.84	127.14	116.87	10.27
0.6	152.68	121.23	31.45	143.19	138.55	4.64	126.57	116.81	9.77
0.7	151.93	120.26	31.67	142.09	137.30	4.79	126.10	116.69	9.41
0.8	151.28	119.53	31.75	141.08	136.37	4.72	125.80	116.23	9.58
0.9	150.14	118.97	31.17	140.49	135.64	4.85	125.61	115.60	10.01
1	148.72	118.52	30.21	140.02	135.05	4.98	125.46	115.10	10.36
1.1	147.29	118.15	29.15	139.65	134.58	5.07	125.33	114.69	10.65
1.2	146.08	117.64	28.24	139.36	134.03	5.33	124.85	114.35	10.50
1.3	145.06	117.55	27.51	139.11	133.43	5.67	124.28	114.06	10.23
1.4	144.18	117.30	26.88	138.89	132.92	5.97	123.88	113.81	10.07
1.5	143.40	117.08	26.32	138.66	132.48	6.19	123.60	113.59	10.01

C.E. : Certainty equivalent value of portfolio measured in dollars
 Calculations are based on initial investment of \$100.

Δ C.E.: Combined Portfolio C.E. - Developed Portfolio C.E.

APPENDIX B: Figures

CHART 1. Efficient Frontier (1992)

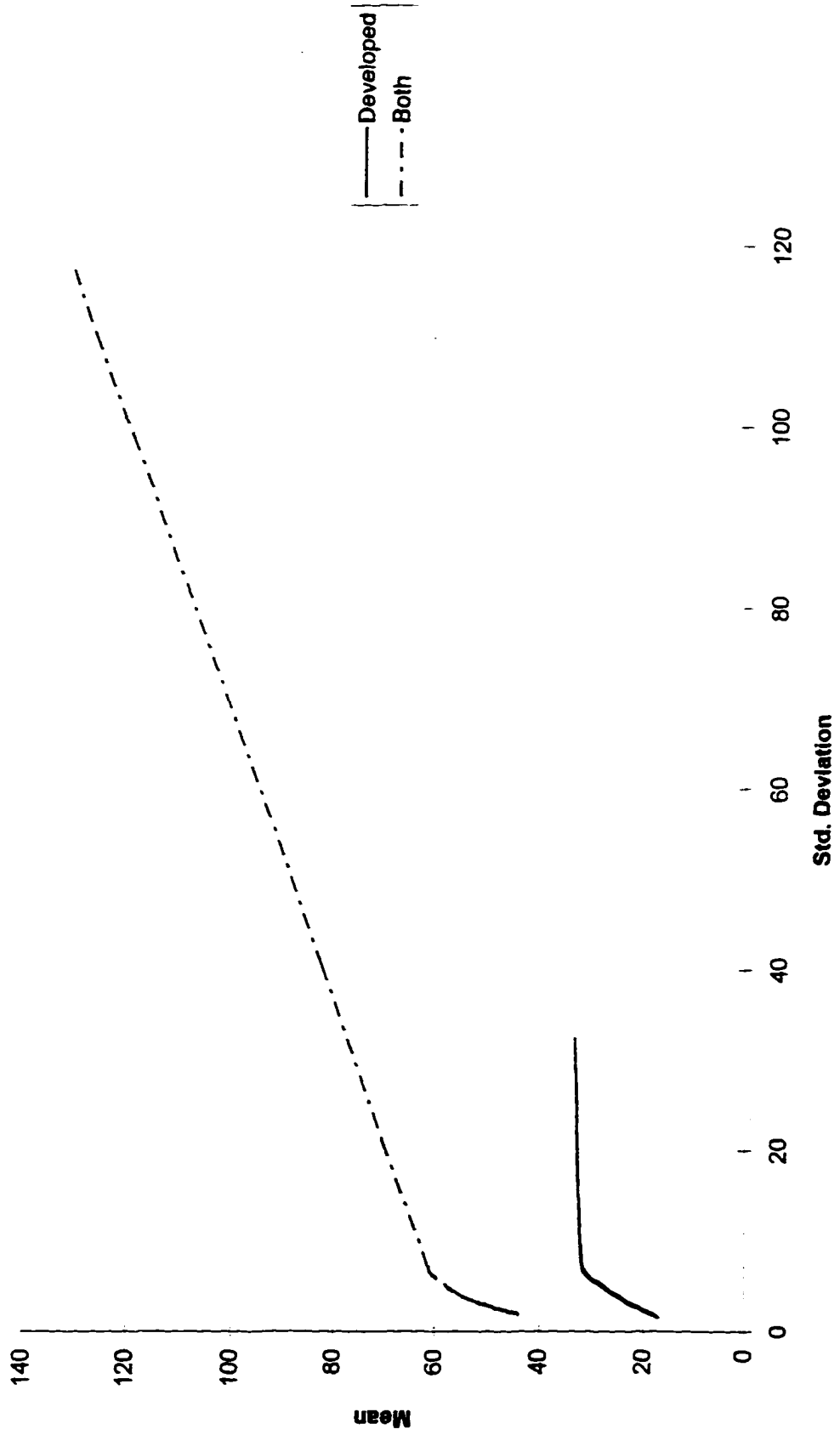


CHART 2. Efficient Frontier (1993)

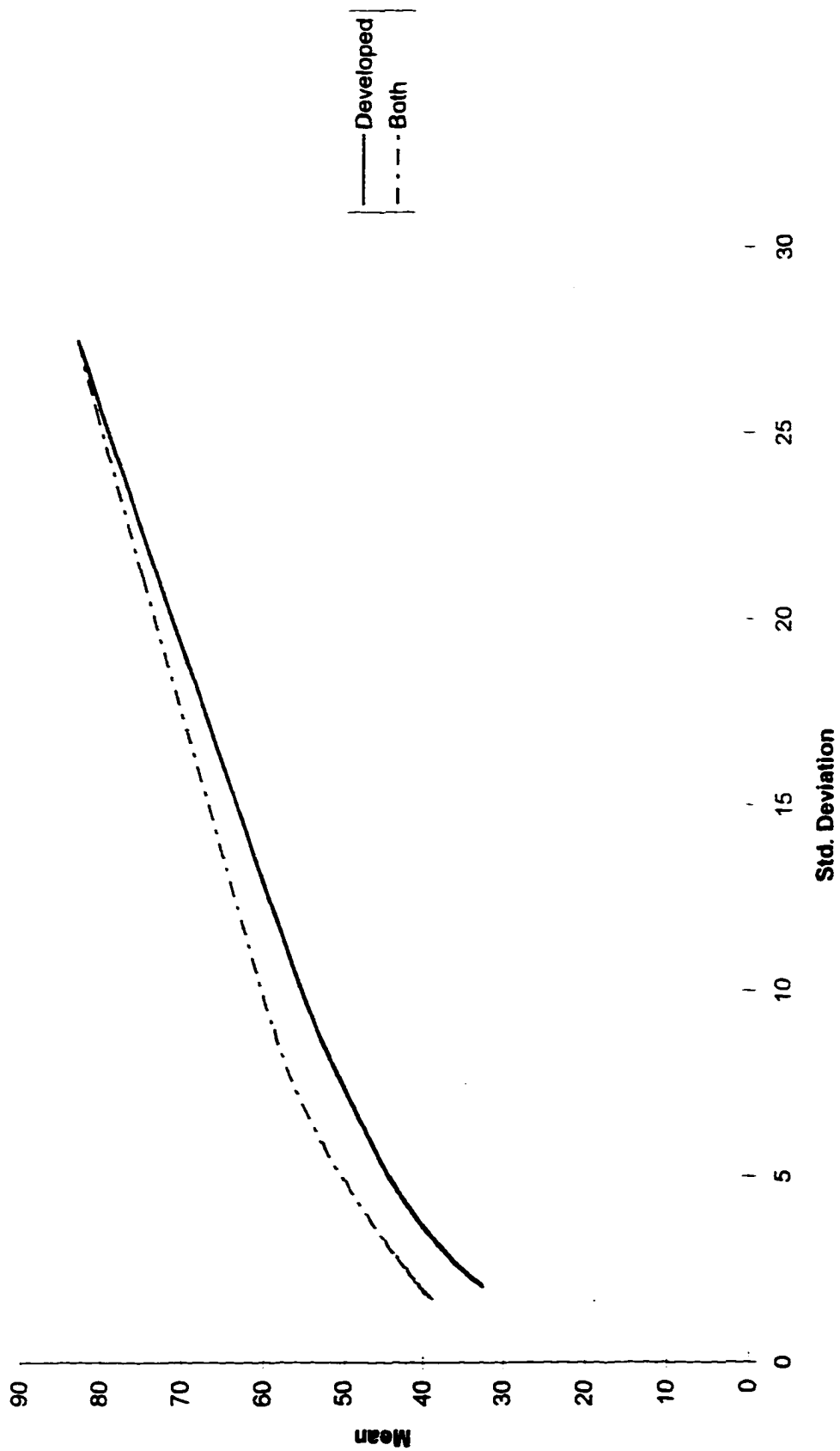
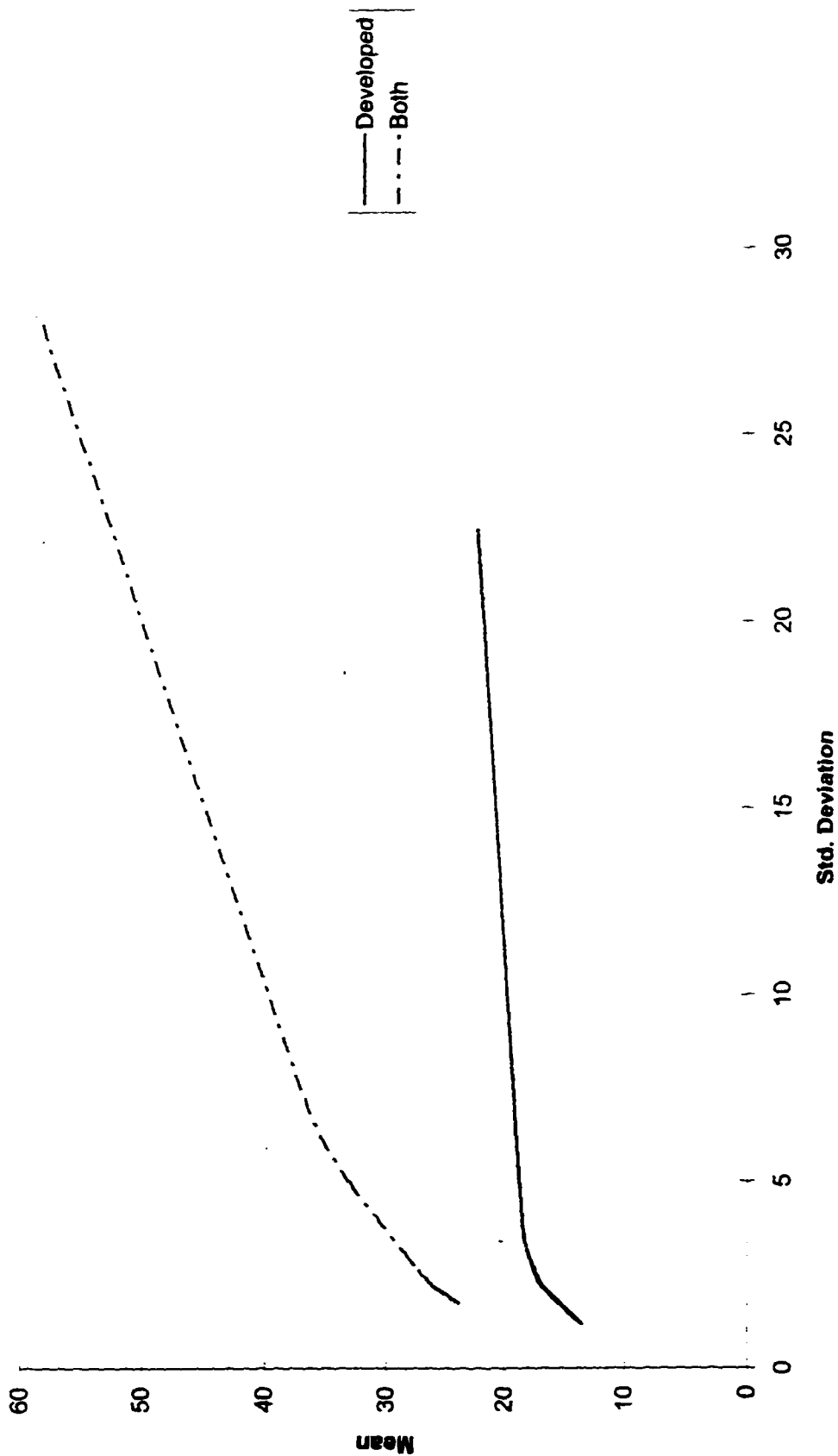


CHART 3. Efficient Frontier (1994)



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