On Market Price of Risk : A Global Evidence

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Introduction

This study assesses the adequacy of the International Capital Asset Pricing Model (ICAPM) in providing an understanding of the risk-return generating process in most of the world capital markets. The basic Capital Asset Pricing Model continues to be popular among academics and professionals and a favored tool utilized in investment management. Many of these individuals consider beta as the standard proxy for risk. However, evidence has shown that many emerging markets have weak and highly volatile correlation with a world market benchmark. In that case, beta is meaningless and unreliable, and the international formulation of the CAPM does not hold.

Our study attempts to relate contemporaneously risk and return in 84 capital markets of the world. We also address the validity of a "state-dependent ICAPM" by describing the cross-sections of each market's reward to risk. That is, we observe how reward to local and world variance are treated in cross-sections of state-dependent risk premia and correlation with the world portfolio. Our findings suggest that conditional variance explains risk premia over time in all markets. We also find that conditional covariance describes risk premia over time in all developed markets and some emerging markets. The tests on cross sections of state-dependent market price of variance and covariance risk revealed that market price of risk is indeed a combination of reward to local and world variance. We also notice that the relative importance of reward to local variance versus world variance depends on the ever-changing correlation with the world market. Our findings are consistent with ICAPM.

The rest of the paper is organized as follows: Section II provides a brief literature review and a discussion of inherent results. In section III, the methodology is discussed. Section IV describes the data. In section V, distributional characteristics of the data and results are discussed. We conclude the study in Section VI.

Literature Review

A relationship over time between risk premium and risk in capital markets is the precept for portfolio selection strategies. Unfortunately, such a relationship has not been empirically accepted because it is usually not clear how to measure risk. Researchers have long addressed this issue using different versions of the seminal Sharpe and Lintner's Capital Asset Pricing Model. Many articles have investigated the cross-sectional and serial relationship between risk premium and local variance, covariance with the world market or beta in most capital markets. The consensus of those studies is that only covariance with the world portfolio matters in developed markets (Bekaert and Harvey, 1995, 1997; Harvey 1991, 1995a,) and market price of covariance risk reflects how investors expect to be rewarded to change in risk in the world market. However, in less integrated markets, correlation with the world portfolio is typically weaker. Harvey (1998, 2000) reports that only local market variance explains the cross-section in emerging markets; and in such markets, market price of variance risk reflects how risk is treated locally. Thus, only covariance with the world market matters in fully integrated markets and only

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local variance matters in purely segmented markets. Evidence now suggests that international capital markets are at different levels of integration with the world market. At one end of the spectrum, there are the more developed markets; at the other end, the highly segmented frontier markets and in between, emerging markets. Based on the ICAPM, we can hypothesize that predicted local market variance (covariance) has a decreasing (increasing) importance in determining excess return as local capital markets become more integrated with the world market. This is an important issue because (1) both reward to local and world variance matter in explaining risk premia; and (2) correlation with the world portfolio is likely to be the determinant of the importance of reward to local variance relative to reward to world variance.

One major problem on the risk-return relationship is that it is not clear how to relate risk premia to variance or covariance. Theoretically, reward to local or world variance shall be positive if investors' expectations are rational. Empirical evidence on the subject is mixed. As a result, several studies suggest that, due to the lack of evidence of the explanatory power of local market variance or covariance, multifactor models need to be examined (see Roll and Ross, 1994). In that case, local and common instrumental variables are used to provide further information on the return generating process in capital markets. Harvey (1991) and Jan et al. (2000) show that financial variables are also instrumental in explaining variance and covariance in equity markets.

It is a well-known limitation of the Sharpe-Lintner CAPM that it imposes constant positive market price of risk, which is only true if we assume that risk aversion is intertemporally constant, that is, independent of the state of the economy and time. For instance, De Santis and Gerard (1997) indicate otherwise. As a result and in response to the lack of evident relationship between risk premia and risk, several CAPM studies examine conditional reward-to-volatility and propose that time-varying reward to risk captures more predictable variations in risk premia than conditional variance or covariance. For example, Bekaert and Harvey (1995) find that reward to risk changes with domestic and world information variables in testing world market integration. Furthermore, Li (1998b) and Jan et al. (2000) suggest that changing prices of risk are more important than changing risk for explaining asset returns. This conclusion makes sense as most empirical studies fail to find a linear relationship between market risk premia and risk. Also, it is somewhat puzzling because common sense naturally leads us to believe that compensation for risk should be proportional to risk, and that reward to risk should depend on risk. Finally, it can be argued that risk aversion to local risk is inversely related to risk aversion to world risk and that this relationship changes over time as market integration (correlation with the world portfolio) changes. Isn't it what the international conditional CAPM is really trying to tell us?

Recently, several studies made a case for methodological problems while testing the relationship between excess return and risk. That is, Sharpe-Lintner CAPM is set ex-ante and can only be tested ex-post; as a result, it is important to account for the negative portion of the risk premium (excess return) distribution in order to set a meaningful ex-post relationship. Pettengill et al. (1995) examined this notion first. The authors developed a state-dependent CAPM that provides an explanation on cross-sections between beta and risk premium in the US.

Data and Methodology

The primary data source for this study is DataStream database. The database contains several reliable sources for international stock market returns series including Morgan Stanley Capital International (MSCI), the International Finance Corporation (IFC) and the Hong Kong and Shanghai Banking Corporation (HSBC). Overall eighty-four index series consisting of twenty-seven developed market series, fifty-six emerging market series, and the world portfolio are utilized. We use daily returns data calculated from the percent logarithmic difference between closing prices. The construction of return indices is based on value-weighted portfolios. All equity returns are calculated in US Dollar; thereby the market price of currency risk is set equal to zero. When calculating daily risk premia (return minus risk-free rate), we use the daily three-month T-bill rate as a proxy for the risk-free rate, which are divided by 252 to be converted into daily rates. Exchange rates and T-bill rates are also obtained from DataStream. All sources, coverage periods and observations are described in Table 1.

In this study, we investigate a contemporaneous relationship between risk premia and concomitant risk in international capital markets. We attempt to capture and relate market price of variance and covariance risk across markets, and thus justify the use of future variance or covariance as a predictor of realized returns. Accordingly, we test two models, which are econometric variants of the single-factor ICAPM. The two models relax the unconditional ICAPM by accounting for state-dependent specifications and conditional second moments. Also, we leave market price of variance or covariance risk as intertemporally constant and assume that market price of currency risk is zero. To account for the state dependency, the upstate/downstate approach of Pettengill et al. is utilized in the study. We start our analysis with the single-factor international CAPM, which can be written as follows:

$$E_{t-1}[RP_{i,t}] = \frac{E_{t-1}[RP_{m,t}]}{\sigma^2_{m,t}} \sigma_{i,m,t} \qquad \forall i \tag{1}$$

where $E_{t-1}[RP_{i,t}]$ is the expected risk premium in market i; $E_{t-1}[RP_{m,t}]$ is the expected world market risk premium; $\sigma^2_{m,t}$ is the future world market variance, and $\sigma_{i,m,t}$ is the future covariance between the world market and local market; $E_{t-1}[RP_{m,t}]/\sigma^2_{m,t}$ is the market price of covariance risk (or reward to world variance). For the world market or a purely segmented market, $E_{t-1}[RP_{i,t}]/\sigma^2_{i,t}$ is the market price of variance risk (or reward to local variance), where $\sigma^2_{i,t}$ is the future local market variance. We then transform equation (1) into an ex-post state-dependent Capital Asset pricing Model by assuming that capital markets are two uncorrelated states of nature—i.e., up or down; also, we impose restrictions on the dynamics of the conditional second moments by following a GARCH-in-mean methodology as in Bollerslev (1986).

For model (1), we use a "state-dependent" GARCH(1,1)-in-Mean parameterization to relate realized risk premia to conditional variance. In this case, we obtain an ex-post test of equation (1) assuming that markets are purely segmented. Model (1) consists of two equations solved simultaneously. The first equation relates market risk premia to forecasted variance. The second equation forecasts the variance of risk premia. The "state-dependent" GARCH(1,1)-in-Mean is expressed as follows:

$$\begin{aligned} RP_{i,t} &= \alpha_i + \phi_i RP_{i,t-1} + \beta_{i,1}\delta_i\sigma^2_{i,t} + \beta_{i,2}(1-\delta_i)\sigma^2_{i,t} + e_{i,t} \\ \sigma^2_{i,t} &= \gamma_i + \omega_i e^2_{i,t-1} + \psi_i\sigma^2_{i,t-1} \end{aligned} \qquad \forall i \tag{2}$$

where $RP_{i,t}$ is the realized risk premium in market i; $\sigma^2{}_{i,t}$ is the conditional variance in a local market; the coefficient α_i (abnormal return) is expected to be insignificant; the coefficient ϕ_i measures the one-lag predictability of the dependent variable; $\beta_{i,1}$ and $\beta_{i,2}$ are up-state and down-state market price of variance risk (or reward to local variance); δ_i is a dummy variable that takes the value of one in an upstate environment (positive contemporaneous market risk premium) and zero in downstate conditions (negative contemporaneous market risk premium); $e^2_{i,t-1}$ is the lag of the squared residual from the mean equation (the ARCH term) and provides news about volatility clustering; $\sigma^2{}_{i,t-1}$ is last period's forecast variance (GARCH term). If the sum of ω_i and ψ_i equals 1, it implies that a current shock persists indefinitely in conditioning the future variance. The sum of ω_i and ψ_i also represents the change in the response function of shocks to volatility per period, a greater value than one implies that the response function of volatility is explosive and a value less than unity implies that shocks decay with time.

For Model (2), we use a bivariate state-dependent-GARCH(1,1)-M, which is expected to portray the hypothesized state-dependent market price of covariance risk. Model (2) is an ex-post representation of equation (1) that assumes that markets are integrated. As in De Santis and Gerard (1997), we use a slightly modified BEKK (Baba, Engle, Kroner and Kraft) model formally described in Engle and Kroner (1995), which provide time-varying variance of a market and the world portfolio, as well as time-varying covariance. For two markets, there are six equations that need to be solved simultaneously. The first equation relates market risk premia with forecasted covariance. The two following equations relate risk premia for a market and the world using inherent forecasted variance. The next two equations forecast the variance of the two portfolios. The final equation forecasts the covariance between a market and the world. The bivariate state-dependent GARCH(1,1)-M specifications are as follows:

$$\begin{aligned} RP_{i,t} &= \alpha_i + \phi_i RP_{i,t-1} + \beta_{i,m,1}\delta_i\sigma_{i,m,t} + \beta_{i,m,2}(1-\delta_i)\sigma_{i,m,t} + e_{i,m,t} \\ RP_{i,t} &= \alpha_i + \beta_i\sigma^2_{i,t} + e_{i,t} \\ RP_{m,t} &= \alpha_m + \beta_m\sigma^2_{m,t} + e_{m,t} \\ \sigma^2_{i,t} &= \gamma_i + \omega_i e^2_{i,t-1} + \psi_i\sigma^2_{i,t-1} \\ \sigma^2_{m,t} &= \gamma_m + \omega_m e^2_{m,t-1} + \psi_m\sigma^2_{m,t-1} \\ \sigma_{i,m,t} &= \gamma_i\gamma_m + \omega_i\omega_m e_{i,t-1}e_{m,t-1} + \psi_i\psi_m\sigma_{i,m,t-1} \end{aligned} \quad \forall i \qquad (3)$$

Where $RP_{m,t}$ the expected risk premium in the world is market; $\sigma_{i,m,t}$ is the conditional covariance between the world and a given market; $\sigma^2_{m,t}$ is the variance of the world market; $\beta_{i,m,1}$ and $\beta_{i,m,2}$ are up-state and down-state market price of covariance risk (or reward to world variance). The other variables have the same definitions as in equations (1) and (2). y, model (1) is used as an ex-post representation for the market-based CAPM; model (2) portrays an ex-post formulation of the ICAPM. Both models allow us to account for up and downstate. Each model is tested on the 84 return series during a period starting from January 1st, 1988 and ending in June 30th, 2001.

Empirical Results

Table 1 presents the descriptive statistics of daily market risk premia for all series. Mean, standard deviation, skewness and kurtosis of returns are presented. Market betas are also computed using an OLS regression between local market risk premia and world market risk premia . All data are in US Dollars. Arithmetic mean risk premia (annualized) range from –9.27 percent (New Zealand) to 6.21 percent (United States) for developed markets, and –50.93 percent (Romania) to 18.63 percent (Estonia) for emerging markets. Annualized standard deviations vary from 15.09 percent (United States) to 31.70 percent (Finland) in developed markets, and 8.83 percent (Bahrain) to 64.27 percent (Argentina). Each country's market risk premium series is characterized by skewness, and excess kurtosis. Serial correlation, residual autocorrelation and volatility clustering are present in each return time series. Note that residual autocorrelation and volatility clustering suggest that variance is conditional; in that sense, a GARCH parameterization is appropriate to model the behavior of daily risk premia.

Developed markets have coefficients of correlation with the world portfolio ranging from 0.21 to 0.72 ; their betas are all significant at 1 percent level and range from 0.40 to 1.15. Emerging markets have coefficients of correlation from –0.03 to 0.39 . 21 emerging markets out of 48 (not including regional and block indices) exhibit insignificant betas that take values between –0.03 and 0.09 . Amongst the other 27 emerging capital markets, betas are significant at least at the 10 percent level and range from 0.14 to 1.51.

We can draw several conclusions from those observations. Firstly, emerging markets are generally more volatile than developed markets (except for Middle East and African markets) but also offer greater return potential. Secondly, there is a wide range of degree of integration (correlation) with the world market. Indeed, all developed markets and about one fourth of emerging markets are usually integrated with the world portfolio (a coefficient of correlation greater than 0.2). The other emerging markets are more segmented (correlation with the world market of less than 0.2); in fact, for most of them, beta is not significant and thus, cannot be used as a measure of risk.

Next, we investigate the cross-sectional relationships between risk premia and the six measures of dispersion expected to provide an explanation of price changes according to the single factor international CAPM—i.e., Beta, volatility, covariance, correlation, skewness and kurtosis. We plot these cross-sections in Figures 1-6. Inherent OLS regressions are also performed for all markets, all developed markets and all emerging markets, respectively; findings are placed under each figure. We find a flat cross-sectional relationship between risk premia and standard deviation, skewness and kurtosis (F-statistics are insignificant). This result is perplexing; indeed, one would expect to be directly rewarded for (1) greater volatility, (2) an increase in the chance of an unexpected large positive or negative movement in risk premia (skewness) and (3) a greater likelihood of big positive or negative (kurtosis). The relationship between risk premia and beta, correlation and covariance is also flat for developed markets. However, we find a significant direct relationship between risk premia and beta (F statistics are 19.24 for all markets and 9.22 for emerging markets), covariance (F statistics are 15.67 for all markets and 6.59 for emerging markets) and correlation (F statistics are 11.60 for all markets and 4.68 for emerging markets). These finding provide support for the international CAPM. It also indicates that beta is a relevant measure of risk depending on the degree of integration with the world portfolio. However, since we are conducting an ex-post cross-sectional test, we are puzzled with the low (around 0.1) R-squared values for the two significant OLS regressions.

Furthermore, an inevitable question remains unanswered: What if beta cannot be measured, as in 21 capital markets out of the 71 investigated in this paper?

Results from models (1) and (2)

If the popular measure of risk (beta) cannot be always computed, then risk needs to be addressed in terms of variance and covariance. We investigate the state-dependent version of the CAPM as in models (1) and (2). The results are summarized in table 2. The findings for model (1) reveal significant positive ($\beta_{i,1}$) and negative ($\beta_{i,2}$) market price of variance risk in upstate and downstate for all markets. Furthermore, the model provides a great fit for a contemporaneous relationship between realized risk premia and conditional variance—i.e., all adjusted R-squared values range from approximately 0.12 in Belgium and Oman to 0.54 in Turkey. In fact, more than 90 percent of the time, R-squared values are greater than 0.2.

Results from the variance equation in model (1) provide evidence of volatility clustering (ω_i) in all markets. Bulgaria, Oman and Tunisia are exceptions however; it might stem from the fact that we only have few observations for these three capital markets. More generally, it is true that volatility clustering is greater in emerging markets. Indeed, ω_i range from 0.01 in Slovakia to 0.48 in Romania; also more than two third of emerging markets have an ARCH coefficient (ω_i) greater than 0.21. Developed markets have ω_i ranging from 0.04 in United States to 0.25 in Germany; furthermore, more than 80 percent of developed markets have an ARCH coefficient (ω_i) lesser than 0.21. The GARCH term (ψ_i) is significant in all capital markets. In the light of the Wald tests for unity (Ho: $\omega_i + \psi_i = 1$), we find that variance seems to usually persist for a long time in many capital markets; however, it tends to decay faster in emerging markets. Note that variance is explosive in Indonesia.

In the testing of model (2), we cannot make the state-dependent bivariate GARCH(1,1)-M converges for 28 countries. All of them are emerging capital markets and most of them also do not have a significant beta in table 1. For the 56 other capital markets, model (2) always points to significant positive ($\beta_{i,m1}$) and negative ($\beta_{i,m2}$) market price of covariance risk in upstate and downstate. Furthermore, the model provides a great fit for a contemporaneous relationship between realized risk premia and conditional covariance—i.e., all adjusted R-squared values range from approximately 0.1 in Indonesia to 0.53 in the United Kingdom. Actually, more than 75 percent of the time, R-squared values are greater than 0.2.

These results point to positive and negative reward to local and world variance, which can be theoretically explained as follows: During periods of growth, risk does not keep the investors away from the market because the stock index generally trends upwards. However, once growth fades, risk drives investors away from equity markets and brings about a direct relationship between risk and returns. Subsequently, the effect of risk on investor behavior and consequent risk-return relationship is state-dependent and a contemporaneous version of the CAPM should be modified to reflect this reality.

Cross-sectional analysis

Models (1) and (2) demonstrate that forecasted variance and covariance with the world explain time-varying risk premia. As evidenced in the literature, these relationships also need to be validated cross-sectionally. Accordingly, we plot cross-sections of upstate and downstate market price of variance risk ($\beta_{i,1}$and $\beta_{i,2}$ from table 2), upstate and downstate market price of covariance risk ($\beta_{i,m1}$and$\beta_{i,m2}$ from table 2) with average positive and negative risk premia, and correlation. Results are not reported for sake of brevity. The results are available upon request.. The results suggest that capital markets are rewarded differently to variance risk and covariance risk, depending on the level of correlation with the world market. Indeed, investors in more segmented (integrated) markets give a higher price to covariance (variance) risk. This means that if an investor is expected to receive more reward to local risk, he/she will require a lesser rate of return on an investment in his/her local market. However, if an investor can obtain a greater reward to world risk, the more he/she will require as a rate of return in his/her local market; thus, suggesting that the local market for investment is competing with the rest of the world market. Our findings also suggest that market price of risk is indeed a combination of reward to local and world variance. Thus, the relative importance of one reward to risk component is at the expense of the other reward to risk component, depending on the level of correlation with the world market. These findings suggest that the one-factor CAPM holds conditionally on local variance, world variance and correlation with the world market.

Conclusion

Our paper investigates the relationship between market risk premium and conditional variance and covariance in 71 capital markets, 8 regional indices, 5 block indices and the world portfolio from January 1988 to June 2001. We initially use univariate and multivariate GARCH(1,1)-M procedures to model the one-factor CAPM and allow up and downstate conditional variance and covariance to have a differential impact on risk premia. We find a linear ex-post relationship with significant upstate and downstate market price of risk and high R-squared values. Next, we investigate the cross-sections of state-dependent market price of variance and covariance risk and find evidence that market price of risk is indeed a combination of reward to local and world variance, which depends on the ever-changing integration with the world market. This conclusion is important because it explains why risk aversion to local variance and world variance is different across markets and changes over time; thereby, we fail to invalidate the one-factor ICAPM. Our findings have interesting practical implications. First, in their efforts to determine optimal weights in a global portfolio, most portfolio managers devote a great amount of time to predict returns using macroeconomic and financial variables. We argue that since a state-dependent CAPM has the ability to generate positive, as well as, negative risk premia, it can be used to capture future trends and, potentially increase the number of correct calls in a tactical asset allocation strategy. Second, if the constantly evolving globalization phenomenon that characterize capital markets explains how risk is treated in each market, then forward looking variables that reflect expectations on changes in correlation with the world portfolio should be instrumental in an "out-of-the-sample" forecast of market returns.

Table 1: Descriptive Statistics on Daily market risk premia

All returns are computed from daily price series in US Dollars. Risk premia are daily differences between daily market return and daily three-month Treasury Bill rate. Mean risk premia and standard deviation of risk premia are annualized by multiplying by 252 and $\sqrt{252}$, respectively. Correlation (Cor.) is computed relative to the MSCI AC World. Jarque Bera tests (not reported) indicate rejection of the null hypothesis for normality in all markets. Ljung-Box statistics (1 to 12lags) for serial correlation are significant for all series (not reported). For each country, we regress each market premium ($RP_{i,t}$) series against world risk premia ($RP_{m,t}$)—i.e., $RP_{i,t} = \alpha + \beta RP_{m,t} + e_t$. Betas and their level of significance are reported. Ljung-Box statistics (1 to 12 lags) on residuals (e_t) and squared residuals are significant for all series (not reported); a, b, c denote rejection of the null hypothesis at 1%, 5%, 10% significant level, respectively.

Region - Europe (Developed)	Source	Start	# of Obs	Mean	StDev	Skew	Kurt	Corr	Beta
Austria	MSCI	1/1/88	3521	-3.28%	19.56%	-0.31	10.86	0.39	0.639a
Belgium	MSCI	1/1/88	3521	1.48%	16.62%	0.19	9.22	0.47	0.655a
Denmark	MSCI	1/1/88	3521	5.88%	17.85%	-0.34	6.54	0.42	0.624a
Finland	MSCI	1/1/88	3521	6.11%	31.70%	-0.52	13.27	0.42	1.126a
France	MSCI	1/1/88	3521	4.60%	18.44%	-0.27	6.26	0.61	0.941a
Germany	MSCI	1/1/88	3521	3.16%	20.62%	-0.62	10.7	0.59	1.013a
Ireland	MSCI	1/1/88	3521	2.78%	18.96%	-0.14	7.32	0.43	0.675a
Italy	MSCI	1/1/88	3521	-1.55%	22.38%	-0.21	6.3	0.45	0.852a
Luxembourg	MSCI	1/1/88	3521	3.95%	23.61%	0.55	17.86	0.21	0.421a
Netherlands	MSCI	1/1/88	3521	4.76%	15.99%	-0.23	6.16	0.59	0.795a
Norway	MSCI	1/1/88	3521	0.99%	21.48%	-0.34	9.09	0.43	0.768a
Portugal	MSCI	1/1/88	3521	-5.70%	18.79%	-0.14	9.8	0.38	0.592a
Spain	MSCI	1/1/88	3521	2.89%	21.90%	-0.33	7.81	0.46	0.823a
Sweden	MSCI	1/1/88	3521	5.86%	23.89%	-0.1	7.58	0.53	1.066a
Switzerland	MSCI	1/1/88	3521	5.37%	17.01%	-0.35	7.66	0.56	0.791a
United Kingdom	MSCI	1/1/88	3521	0.98%	15.89%	-0.06	5.28	0.62	0.823a
Region - Europe (Emerging)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Bulgaria	BSE Sofia Lazard	1/1/98	909	-42.07%	47.45%	0.06	44.61	0.06	0.199b
Croatia	HSBC	1/1/98	909	-19.55%	35.24%	0.22	9.57	0.15	0.356a
Czech Republic	MSCI	1/1/95	1695	-11.29%	24.51%	-0.09	5.07	0.31	0.586a
Estonia	ARIPAEV INDEX	1/1/96	1622	18.63%	38.21%	-0.75	22.6	0.07	0.205b
Greece	MSCI	1/1/88	3500	4.37%	31.14%	0.11	8.01	0.23	0.604a
Hungary	MSCI	1/1/95	1695	3.96%	34.45%	-0.56	12.38	0.35	0.955a
Iceland	ICEX	1/1/93	2213	6.40%	9.78%	-0.38	10.41	0	0.002
Latvia	HSBC	1/1/98	909	-25.91%	32.33%	1.77	38.39	0.09	0.182c
Poland	MSCI	1/1/93	2216	10.19%	40.46%	-0.17	6.5	0.21	0.701a
Romania	HSBC	1/1/98	982	-50.93%	36.34%	0.04	8.34	0.04	0.089
Russia	MSCI	1/1/95	1695	6.37%	62.37%	-0.29	9.39	0.31	1.506a
Slovakia	HSBC	1/1/96	1431	-24.74%	28.68%	-0.59	7.55	0	0.007
Slovenia	HSBC	1/1/96	1431	-11.22%	25.52%	1.06	18.24	-0.01	-0.021
Ukraine	KP-Dragon	1/1/98	1082	-20.66%	36.19%	-0.77	8.79	0.02	0.043

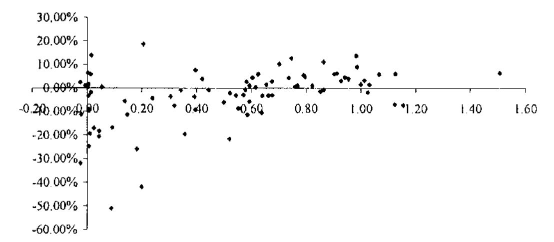
Table 1: Descriptive Statistics on Daily Market Risk Premia (Continued)

Region - Australasia (Developed)	Source	Start	# of Obs	Mean	StDev	Skew	Kurt	Corr	Beta
Australia	MSCI	1/1/88	3521	-0.70%	17.69%	-0.22	6.14	0.3	0.444a
Hong Kong	MSCI	1/1/88	3521	4.22%	27.49%	-1.05	25.64	0.32	0.737a
Japan	MSCI	1/1/88	3521	-7.31%	23.01%	0.41	7.6	0.6	1.154a
New Zealand	MSCI	1/1/88	3521	-9.27%	22.85%	-0.26	11.13	0.21	0.395a
Singapore	MSCI	1/1/88	3521	0.41%	21.10%	0.02	12.55	0.35	0.615a
Region - Australasia (Emerging)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Bangladesh	Dahka SE	1/1/93	2986	-1.97%	30.14%	0.46	109.27	0.01	0.014
China	MSCI	1/1/93	2216	-21.64%	33.88%	0.21	7.75	0.18	0.520a
India	MSCI	1/1/93	2216	-5.49%	26.66%	-0.09	5.5	0.06	0.137b
Indonesia	MSCI	1/1/88	3521	-7.50%	46.72%	0.21	47.09	0.08	0.318a
Korea	MSCI	1/1/88	3521	-6.05%	38.05%	0.45	16.55	0.16	0.500a
Malaysia	MSCI	1/1/88	3521	-3.05%	32.66%	-0.77	56.53	0.2	0.542a
Pakistan	MSCI	1/1/93	2216	-16.89%	31.39%	-0.58	11.66	0.03	0.091
Philippines	MSCI	1/1/88	3521	-3.46%	27.02%	0.75	16.07	0.13	0.304a
Sri Lanka	MSCI	1/1/93	2216	-18.46%	20.15%	0.06	8.12	0.03	0.044
Taiwan	MSCI	1/1/88	3521	-0.88%	34.08%	0	5.53	0.12	0.343a
Thailand	MSCI	1/1/88	3521	-8.54%	34.15%	0.41	10.23	0.19	0.552a
Region - North America (Developed)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Canada	MSCI	1/1/88	3521	0.65%	15.84%	-0.77	11.89	0.58	0.768a
USA	MSCI	1/1/88	3521	6.21%	15.09%	-0.41	8.46	0.72	0.912a
Region - Latin America (Emerging)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Argentina	MSCI	1/1/88	3521	12.54%	64.27%	-2.98	102.23	0.14	0.746a
Brazil	MSCI	1/1/88	3521	8.92%	46.73%	-0.46	10.79	0.25	0.985a
Chile	MSCI	1/1/88	3521	7.60%	20.42%	-0.5	15.07	0.23	0.395a
Colombia	MSCI	1/1/93	2216	-11.32%	21.62%	0.3	11.74	0.08	0.146a
Mexico	MSCI	1/1/88	3521	13.76%	32.10%	-0.14	16.11	0.37	0.983a
Peru	MSCI	1/1/93	2216	-0.63%	26.88%	0.11	8.51	0.26	0.578a
Venezuela	MSCI	1/1/93	2216	-2.82%	45.05%	-6.73	185.6	0.15	0.571a

Table 1: Descriptive Statistics on Daily Market Risk Premia (Continued)

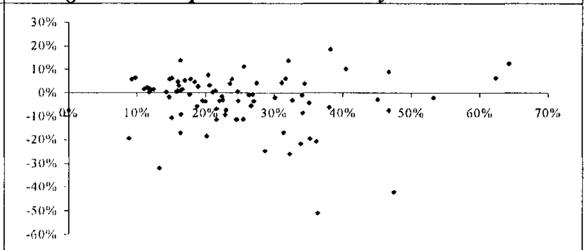
Region - MENA (Emerging)	Source	Start	# of Obs	Mean	StDev	Skew	Kurt	Corr	Beta
Bahrain	IFC	4/20/00	310	-19.51%	8.83%	-0.03	11.28	0.02	0.011
Egypt	MSCI	1/1/95	1693	-3.31%	22.08%	0.4	7.26	0	0.005
Israel	MSCI	1/1/93	2216	-0.72%	26.35%	-0.31	7.2	0.39	0.864a
Jordan	MSCI	1/1/88	3521	-9.16%	16.45%	-10.81	358.91	0	0.005
Kuwait	KIC	1/1/95	1679	1.54%	11.03%	0.23	6.51	0.01	0.005
Lebanon	BLOM	1/1/96	1417	-17.03%	16.35%	0.39	7.27	0.02	0.024
Morocco	MSCI	1/1/95	1693	0.38%	11.82%	0.38	10.19	0	0.001
Oman	IFC	4/20/00	310	-31.99%	13.27%	2.97	32.8	-0.03	-0.024
Saudi Arabia	IFC	1/1/98	910	0.45%	14.27%	0.61	13.32	0.06	0.054
Tunisia	TUNINDEX	1/1/98	910	2.38%	11.52%	-1.6	100.5	-0.03	-0.025
Turkey	MSCI	1/1/88	3521	-2.02%	53.24%	-0.1	8.06	0.12	0.522a
Region - Africa (Emerging)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Kenya	Nairobi SE	1/1/93	2989	0.89%	11.86%	2.43	39.62	-0.01	-0.006
Mauritius	SEMDEX	1/1/93	3125	5.73%	9.22%	0.68	19.3	0.02	0.013
Nigeria	IFC	1/1/96	1563	13.89%	16.35%	0.13	11.35	0.01	0.014
South Africa	MSCI	1/1/93	2216	0.63%	24.70%	-0.42	11.04	0.37	0.761a
Zimbawe	IFC	1/1/96	1563	-4.22%	35.11%	-2.2	30.91	0.09	0.238b
Regional Indices (Developed)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
European Monetary Union	MSCI	1/1/88	3521	3.00%	16.10%	-0.54	9.79	0.69	0.927a
North America	MSCI	1/1/88	3521	5.88%	14.77%	-0.42	8.58	0.73	0.902a
Regional Indices Emerging)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Asia "Emerging"	MSCI	1/1/88	3521	-3.58%	20.00%	-0.05	6.17	0.23	0.392a
Asia Far-East	MSCI	1/1/88	3521	-6.84%	21.60%	0.37	7.71	0.62	1.123a
Europe "Emerging"	MSCI	1/1/88	3521	-3.28%	24.77%	-0.42	7.81	0.32	0.662a
Europe & Middle East	MSCI	1/1/88	3500	-3.06%	22.52%	-0.46	8.1	0.36	0.676a
Middle East and Africa	IFC	1/1/98	640	2.68%	18.89%	-0.49	7.16	0.45	0.582a
Latin America "Emerging"	MSCI	1/1/88	3521	11.21%	25.60%	-0.33	11.87	0.4	0.864a
Block Indices (Developed)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
EAFE	MSCI	1/1/88	3521	-1.77%	14.68%	-0.09	6.82	0.83	1.025a
G7	MSCI	1/1/88	3521	1.45%	12.43%	-0.18	6.32	0.99	1.031a
Block Indices (Emerging)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
Emerging "COMPOSITE"	IFC	1/1/95	1532	-10.57%	15.09%	-0.79	7.46	0.55	0.637a
Emerging Markets	MSCI	1/1/88	3521	1.06%	16.36%	-0.36	6.61	0.43	0.592a
Block Indices (World)	**Source**	**Start**	**# of Obs**	**Mean**	**StDev**	**Skew**	**Kurt**	**Corr**	**Beta**
World "All Countries"	MSCI	1/1/88	3521	1.55%	11.95%	-0.22	6.52	1	1

Figure 1: Risk premia and beta across markets



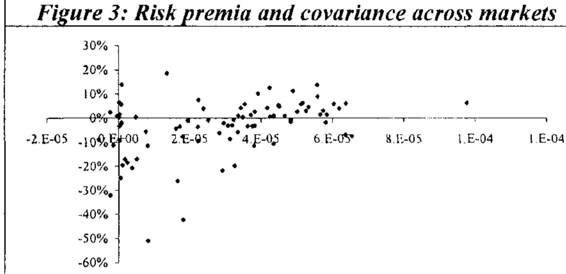
	Intercept	Slope	R2	F-stat
All markets	-0.1014 (-5.11a)	0.13623 (4.39a)	0.122	19.24a
Developed Markets	-0.0277 (-0.88)	0.0528 (1.39)	0.072	1.93
Emerging Markets	-0.1054 (-4.35a)	0.137757 (3.04a)	0.104	9.22a

Figure 2: Risk premia and volatility across markets



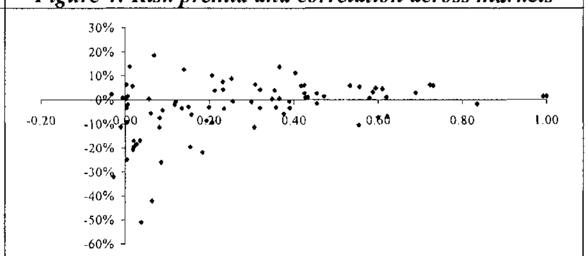
	Intercept	Slope	R2	F-stat
All Markets	-0.0069 (-0.22)	-0.096 (-0.85)	0.009	0.73
Developed Markets	0.0216 (0.60)	-0.036 (-0.20)	0.002	0.04
Emerging Markets	-0.0545 (-1.24)	0.005 (0.04)	0.001	0.001

Figure 3: Risk premia and covariance across markets



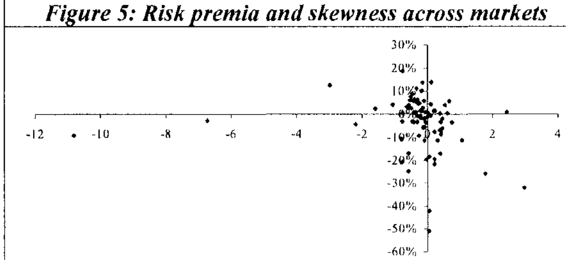
	Intercept	Slope	R2	F-stat
All Markets	-0.0964 (-4.73a)	2163.6 (3.96a)	0.102	15.67a
Developed Markets	-0.0277 (-0.89)	931.6 (1.39)	0.072	1.936
Emerging Markets	-0.0998 (-3.98a)	2044.0 (2.57a)	0.081	6.59a

Figure 4: Risk premia and correlation across markets



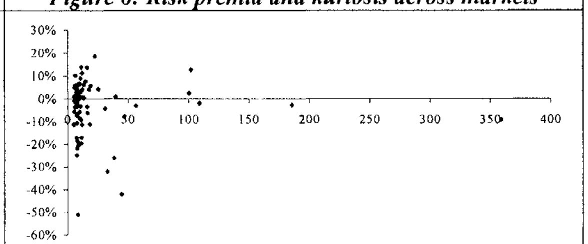
	Intercept	Slope	R2	F-stat
All Markets	-0.0779 (-4.25a)	0.1669 (3.41a)	0.105	11.60a
Developed Markets	-0.0086 (-0.38)	0.0437 (1.10)	0.046	1.20
Emerging Markets	-0.0907 (-3.68a)	0.2368 (2.17a)	0.080	4.68b

Figure 5: Risk premia and skewness across markets



	Intercept	Slope	R2	F-stat
All Markets	-0.0338 (-2.57a)	-0.0089 (-1.08)	0.0142	1.16
Developed Market	0.0051 (0.52)	-0.0394 (-1.61)	0.094	2.61
Emerging Market	-0.0562 (-3.06a)	-0.0091 (-0.95)	0.017	0.91

Figure 6: Risk premia and kurtosis across markets



	Intercept	Slope	R2	F-stat
All Markets	-0.0283 (-1.96a)	-0.0001 (-0.42)	0.0022	0.17
Developed Market	0.0075 (0.37)	0.0008 (0.39)	0.006	0.15
Emerging Market	-0.0534 (-2.60a)	0.0000105 (0.03)	0.001	0.01

Figures 1 to 6 depict the cross sections of mean risk premia and beta, standard deviation, covariance, correlation, skewness and kurtosis (n=84 for all series, n=28 for developed markets and n=57 for emerging markets). All data are obtained from Table 1. A, b, c denote rejection of the null hypothesis at 1%, 5%, 10% levels, respectively.

Table 2: Relevant Statistics for Models (1) and (2)

The values below each coefficient is the inherent t statistic. "WT"" consists of testing the null hypothesis " $\omega + \gamma = 1$ " for variance persistence with a Wald test, we report the inherent F statistic. "†" in front of the name of a country indicates that the model (2) does not converge for that market. Durbin Watson Statistics are not reported but range from 1.8 to 2.1 for all series. ARCH LM tests on standardized squared residuals in the mean equations of models (1) and (2) are not reported but suggests rejection of heteroskedasticity. a, b, c denote rejection of the null hypothesis at 1%, 5%, 10% levels, respectively.

	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-Europe	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Austria	-0.0003	58.94	-55.25	0.05	0.95	0.82	0.35	-0.0002	207.4	-202.36	0.24
	-1.02	20.48a	-20.65a	3.58a	51.51a			-0.87	20.37a	-19.54a	
Belgium	0.00009	71.02	-71.58	0.14	0.78	10.02a	0.12	0.00011	177.32	-188.68	0.30
	0.33	17.78a	-21.94a	7.17a	28.41a			0.47	20.84a	-21.48a	
Bulgaria †	-0.00375	48.1	-1.25	-0.01	0.84	1.55	0.49	0.00009	946.57	-110.43	0.00
	-2.33b	6.19a	-0.83	-0.57	5.67a			0.08	5.57a	-3.02a	
Croatia †	0.00208	25.59	-36.33	0.2	0.62	9.07a	0.39	-0.00082	273.76	-237.11	0.10
	1.44	6.10a	-10.25a	3.21a	7.62a			-1.05	7.81a	-8.04a	
Czech Rep.	0.00015	41.28	-42.59	0.09	0.87	4.66b	0.19	0.0001	171.83	-184.47	0.27
	0.41	20.95a	-22.25a	5.18a	33.59a			0.33	17.51a	-20.42a	
Denmark	0.00022	61.95	-65.68	0.1	0.83	3.42c	0.39	0.00031	195.1	-210.55	0.31
	0.8	24.83a	-24.41a	4.75a	15.36a			1.13	21.88a	-22.22a	
Estonia †	0.00069	19.19	-19.54	0.4	0.61	0.02	0.26	0.00095	99.95	-137.22	0.00
	1.07	12.24a	-12.32a	2.97a	9.77a			1.46	4.38a	-5.40a	
Finland	-0.00022	38.66	-34.2	0.07	0.92	2.23	0.44	-0.00004	211.46	-195.94	0.31
	-0.88	32.72a	-28.97a	4.20a	48.73a			-0.13	25.78a	-22.39a	
France	0.00064	59.05	-70.81	0.15	0.74	4.88b	0.30	0.00063	142.82	-176.03	0.41
	1.69c	18.79a	-20.05a	2.30b	6.53a			2.03b	22.16a	-22.56a	
Germany	0.00068	52.13	-60.35	0.25	0.69	3.75c	0.44	0.00069	153.96	-179.72	0.33
	2.44b	26.63a	-26.38a	2.37b	6.45a			2.63b	25.80a	-27.89a	
Greece	0.00015	32.75	-32.07	0.15	0.81	3.13c	0.39	0.00027	247.43	-263.17	0.16
	0.51	28.00a	-23.30a	6.52a	26.79a			0.98	20.49a	-24.19a	
Hungary	0.00022	29.74	-28.24	0.36	0.53	3.04c	0.27	0.00071	197.17	-224.56	0.31
	0.32	16.09a	-12.75a	2.83a	5.92a			1.1	14.19a	-12.43a	
Iceland †	0.00038	103.28	-100.74	0.08	0.9	2.98c	0.43	0.0005	-0.08	23.7	-0.01
	2.09b	16.84a	-15.73a	4.28a	33.29a			4.61a	0	0.82	
Ireland	-0.00014	60.45	-56.94	0.17	0.72	12.63a	0.28	0.00013	204.02	-210.54	0.32
	-0.41	21.20a	-18.03a	4.70a	12.95a			0.46	20.72a	-19.47a	
Italy	0.00026	49.35	-52.41	0.09	0.85	21.53a	0.39	0.00021	162.08	-170.18	0.33
	0.74	23.90a	-24.63a	4.12a	29.59a			0.66	23.83a	-22.71a	
Latvia †	0.00202	17.22	-22.02	0.26	0.64	1.81	0.33	0.00019	128.17	-109.84	0.02
	1.33	8.59a	-9.19a	3.37a	6.33a			0.22	6.14a	-5.50a	
Luxembourg	0.00003	45.55	-45.29	0.19	0.76	4.22b	0.42	0.0001	202.76	-204.37	0.18
	0.09	19.86a	-21.14a	4.15a	16.29a			0.38	20.03a	-19.31a	
Netherlands	0.00035	71.09	-77.74	0.1	0.85	5.80b	0.26	0.00034	153.79	-168.1	0.45
	1.29	22.78a	-22.00a	3.37a	17.32a			1.37	24.21a	-22.61a	
Norway	0.00109	49.92	-59.24	0.19	0.71	3.23c	0.45	0.00099	183.49	-214.79	0.28
	3.04a	20.87a	-22.27a	2.57b	5.83a			3.44a	21.02a	-25.01a	
Poland	-0.00008	26.71	-24.94	0.1	0.87	3.33c	0.27	0.00034	204.27	-208.9	0.17
	-0.15	20.09a	-18.64a	4.55a	31.57a			0.75	16.83a	-17.37a	
Portugal	-0.00032	60.1	-54.14	0.1	0.87	3.07c	0.42	-0.00026	199.71	-181.2	0.15
	-1.28	26.46a	-22.57a	4.78a	24.47a			-1.43	22.09a	-22.59a	
Romania †	0.00308	16.35	-34.08	0.48	0.24	4.86b	0.34	-0.00135	-162.22	44.4	-0.05
	3.42a	6.84a	-12.28a	3.98a	2.34a			-2.54b	-4.26a	1.59	
Russia	-0.00014	17.61	-14.79	0.24	0.69	3.56c	0.38	0.0016	217.79	-246.93	0.25
	-0.13	15.57a	-11.59a	3.62a	9.85a			2.17b	16.46a	-12.79a	

Table 2: Relevant Statistics for Models (1) and (2) (continued)

	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-Europe	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Continued											
Slovakia †	-0.00052	35.8	-36.04	0.01	0.98	0.65	0.25	-0.00086	45.44	-39.87	0.00
	-0.66	12.82a	-11.91a	2.19b	128.63a			-1.97b	1.02	-0.89	
Spain	-0.0001	57.76	-56.56	0.13	0.79	7.38a	0.46	-0.00005	160.81	-162.49	0.27
	-0.26	22.08a	-20.22a	3.66a	14.07a			-0.16	21.77a	-20.40a	
Slovenia †	-0.00062	43.83	-43.79	0.16	0.77	1.74	0.20	-0.00071	21.26	-84.06	-0.01
	-0.71	10.68a	-11.32a	3.68a	12.67a			-1.91c	0.92	-3.51a	
Sweden	0.0009	46.9	-52.73	0.13	0.82	5.93c	0.19	0.00087	170.23	-191.44	0.30
	2.76a	23.85a	-21.56a	3.92a	20.03a			2.80a	20.83a	-22.60a	
Switzerland	0.00044	67.54	-73.41	0.23	0.64	11.14a	0.26	0.00025	176.66	-184.56	0.35
	1.2	17.81a	-18.57a	3.00a	6.70a			0.81	20.88a	-20.02a	
UK	-0.00018	76.54	-73.27	0.1	0.82	14.06a	0.42	-0.00016	163.35	-155.7	0.53
	-0.62	22.74a	-21.54a	4.36a	22.32a			-0.59	22.58a	-21.60a	
Ukraine †	-0.00059	25.17	-22.43	0.09	0.91	0.01	0.36	-0.00108	149.98	-34.04	-0.02
	-1.47	14.85a	-13.69a	5.33a	56.72a			-3.25a	6.95a	-1.81c	

	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-Australasia	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Australia	-0.00008	70.03	-65.37	0.13	0.75	17.95a	0.53	-0.00014	293.95	-266.37	0.39
	-0.17	16.75a	-14.82a	4.37a	17.90a			-0.52	22.13a	-20.83a	
Bangladesh †	-0.00193	17.49	-12.42	0.38	0.74	1.62	0.16	-0.00191	-75	-30.45	0.00
	-1.53	10.01a	-4.65a	3.97a	25.91a			-1.37	-2.92a	-1.4	
China	-0.00116	33.14	-27.75	0.28	0.68	3.20c	0.35	-0.00095	338.31	-292.62	0.23
	-2.36b	20.89a	-13.81a	7.87a	25.87a			-2.68a	21.07a	-18.89a	
Hong Kong	0.0002	43	-37.55	0.22	0.71	4.25b	0.43	0.00073	187.98	-188.3	0.28
	0.23	9.16a	-7.57a	5.36a	26.22a			2.62b	20.36a	-23.19a	
India †	-0.00035	42.48	-37.96	0.07	0.88	5.02b	0.39	-0.00006	232.02	-251.38	0.03
	-0.73	20.95a	-18.09a	6.00a	34.46a			-0.19	13.42a	-12.17a	
Indonesia	0.00079	9.4	-16.68	0.46	0.67	6.54b	0.50	0.00049	237.64	-233.78	0.10
	2.20b	4.94a	-15.12a	7.10a	31.91a			1.68c	10.61a	-13.41a	
Japan	-0.00047	52.31	-45.37	0.13	0.84	5.72b	0.38	-0.00047	148.09	-128.4	0.42
	-1.68c	24.02a	-23.45a	7.44a	40.29a			-1.66c	26.62a	-23.47a	
Korea	-0.00001	33.28	-28.72	0.1	0.88	6.78a	0.29	-0.00015	203.46	-183.38	0.21
	-0.03	26.72a	-26.16a	8.33a	75.98a			-0.56	17.33a	-17.48a	
Malaysia	0.00021	35.74	-38.04	0.17	0.79	1.37	0.50	-0.00035	233.26	-196.43	0.14
	0.29	6.45a	-10.02a	3.63a	37.54a			-0.64	14.55a	-13.75a	
New Zealand	-0.00048	52.22	-47.54	0.17	0.73	22.59a	0.29	0.00004	287.08	-289.1	0.25
	-0.97	20.47a	-18.24a	4.50a	16.94a			0.12	22.43a	-23.33a	
Philippines	-0.00008	39.5	-39.4	0.28	0.68	2.13	0.35	0.00029	238.22	-248.22	0.17
	-0.28	23.93a	-20.53a	8.19a	24.11a			1.16	17.89a	-17.50a	
Pakistan †	0.00009	32.38	-29.73	0.16	0.78	5.05b	0.24	-0.00047	208.48	-199.59	-0.03
	0.2	19.76a	-18.87a	5.34a	22.26a			-1.47	9.63a	-9.92a	
Singapore	0.00048	51.11	-54.51	0.22	0.73	6.20b	0.44	0	194.35	-204.27	0.29
	2.20b	22.58a	-26.55a	4.19a	16.76a			1.42	22.00a	-23.19a	
Sri Lanka †	-0.00073	47.24	-38.21	0.31	0.59	5.00b	0.34	-0.00074	197.78	-144.73	-0.01
	-2.12b	14.69a	-11.77a	5.55a	11.11a			-3.83a	7.74a	-4.34a	
Taiwan	-0.00008	35.06	-30.33	0.08	0.89	7.63a	0.42	0.00035	186.49	-153.77	0.11
	-0.19	26.98a	-23.33a	5.82a	44.08a			1.18	16.17a	-14.63a	
Thailand	0.00031	28.22	-28.83	0.15	0.82	6.22b	0.49	0.0002	220.4	-234.91	0.20
	1.08	23.95a	-26.70a	6.63a	34.85a			0.7	20.21a	-21.25a	

Table 2: Relevant Statistics for Models (1) and (2) (continued)

	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-North America	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Canada	0.00012	69.53	-74.98	0.08	0.9	4.34b	0.50	0.00019	142.87	-159.51	0.36
	0.74	27.32a	-22.57a	4.39a	43.34a			1.16	25.72a	-22.28a	
US	0.00011	73.21	-68.04	0.04	0.93	12.50a	0.49	0.00015	124.86	-114.92	0.42
	0.62	27.92a	-26.25a	3.68a	78.38a			0.84	28.76a	-25.72a	
	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-Latin America	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Argentina	0.00064	18.9	-18.98	0.21	0.77	0.54	0.51	0.00072	143.52	-157.87	0.12
	1.37	15.67a	-24.27a	6.17a	38.19a			1.91c	21.17a	-19.30a	
Brazil	0.00013	22.92	-21.16	0.19	0.78	3.35c	0.41	0.00069	147.37	-156.79	0.23
	0.3	29.17a	-23.33a	7.51a	46.13a			1.71c	23.11a	-22.15a	
Chile	0.00022	47.69	-51.07	0.35	0.51	4.88b	0.42	-0.00023	202.86	-153.17	0.12
	0.5	11.49a	-16.46a	4.80a	13.48a			-0.89	20.81a	-17.34a	
Colombia †	0.00001	33.7	-35.67	0.34	0.6	1.94	0.50	-0.00032	346.89	-234.99	0.05
	0.05	12.47a	-12.14a	6.75a	11.34a			-1.52	13.40a	-10.93a	
Mexico	0.00104	33.51	-37.23	0.29	0.62	5.79b	0.40	0.00119	143.41	-162.62	0.17
	1.6	12.25a	-11.78a	4.93a	16.92a			3.81a	22.01a	-25.09a	
Peru	0.00015	36.63	-35.36	0.11	0.79	7.80a	0.33	0.00048	238.1	-249.74	0.19
	0.37	18.18a	-16.05a	3.87a	15.01a			1.28	13.82a	-16.80a	
Venezuela	-0.00074	23.78	-20.56	0.23	0.74	15.20a	0.16	0.0015	321.86	-365	0.11
	-1.53	17.45a	-16.77a	4.73a	27.11a			1.3	8.44a	-6.10a	
	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-MENA	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Bahrain †	-0.00142	160.62	-46.07	0.42	0.509	3.01c	0.12	-0.00076	88.07	58	0.01
	-3.45a	7.89a	-3.65a	2.68a	7.02a			-2.79a	1.52	2.42b	
Egypt †	-0.00012	47.99	-30.79	0.04	0.96	0.17	0.39	-0.00017	-102.51	34.17	-0.02
	-0.52	20.90a	-17.65a	3.55a	75.63a			-0.88	-3.51a	1.46	
Israel	0.0004	38.64	-41.26	0.13	0.78	12.85a	0.33	0.00015	184.62	-181.21	0.33
	0.98	19.44a	-20.41a	5.26a	22.62a			0.45	19.77a	-18.05a	
Jordan †	-0.00017	103.44	-52.58	0.05	0.91	0.52	0.43	-0.00101	-306.3	62.92	-0.06
	-0.73	16.79a	-11.62a	3.95a	43.74a			-2.87a	-1.99b	2.17b	
Kuwait †	0.00036	78.11	-93.45	0.3	0.5	15.01a	0.16	0.0001	6.11	-14.34	0.00
	1.62	13.18a	-13.32a	5.23a	7.03a			0.81	0.19	-0.63	
Lebanon †	-0.00102	64.38	-35.62	0.2	0.73	3.69c	0.41	-0.00063	82.53	68.78	0.00
	-3.53a	18.76a	-10.97a	4.00a	10.22a			-2.36b	2.16b	1.1	
Morocco †	0.00007	89.75	-92.16	0.32	0.42	11.75a	0.32	0.00006	-110.6	83.52	-0.02
	0.18	9.36a	-9.73a	3.77a	3.78a			0.4	-5.13a	3.95a	
Oman †	-0.00344	113.27	-5.2	0.02	1.01	0.01	0.12	-0.00154	206.33	9.2	0.05
	-6.61a	11.55a	-0.93	1.01	33.19a			-3.74a	2.28b	0.44	
Saudi Arabia †	-0.00018	92.8	-44.48	0.02	0.97	0.74	0.26	0.00042	279.08	-295.49	0.04
	-0.45	11.32a	-7.82a	2.01b	72.99a			1.39	4.96a	-6.081a	
Tunisia †	-0.00141	85.04	-5.92	0	1.01	0.66	0.35	-0.0003	-227.8	155.01	0.02
	-8.32a	10.72a	-2.15b	-0.29	90.50a			-1.53	-4.72a	3.13a	
Turkey †	-0.00072	21.64	-19.16	0.2	0.73	16.40a	0.54	0.00009	162.43	-189.16	0.08
	-0.99	23.01a	-18.82a	7.63a	23.33a			0.2	13.74a	-14.58a	

Table 2: Relevant Statistics for Models (1) and (2) (continued)

	Model 1: Market-based CAPM							Model 2: International CAPM			
Region-Africa	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Kenya †	-0.00039	83.17	-69.67	0.33	0.52	8.35a	0.39	-0.00053	-102.14	190.98	-0.06
	-1.90c	15.36a	-11.29a	3.30a	5.40a			-3.80a	-3.11a	5.50a	
Mauritius †	-0.0003	147.53	-54.52	0.21	0.68	2.84c	0.24	0.00008	-47.31	55.28	0.00
	-2.19b	20.39a	-11.47a	2.73a	5.38a			0.73	-1.06	2.41b	
Nigeria †	0.00015	52.65	-52.87	0.18	0.77	1.42	0.14	0.00043	23.55	6.23	0.00
	0.51	16.79a	-14.16a	3.12a	14.04a			1.97b	0.78	0.24	
South Africa	0.00014	41.73	-40.91	0.1	0.89	1.16	0.32	0.00045	190.49	-206.72	0.28
	0.46	21.74a	-21.84a	3.08a	22.91a			1.55	20.94a	-17.93a	
Zimbabwe †	0.00165	11.42	-14.02	0.44	0.56	1.79	0.34	0.00154	162.75	-202.84	0.13
	1.84c	8.75a	-12.80a	2.11b	5.32a			3.47a	7.27a	-6.91a	
	Model 1: Market-based CAPM							Model 2: International CAPM			
Regional Indices	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
Asia "Emerging"	0.00002	52.54	-51.01	0.06	0.93	3.01c	0.46	0.00008	200.57	-191.73	0.23
	0.12	30.73a	-32.45a	6.49a	92.02a			0.56	23.73a	-24.42a	
Asia Far-East	-0.00025	54.87	-51.32	0.14	0.82	6.30b	0.51	-0.00045	144.73	-127.11	0.42
	-0.89	24.29a	-23.78a	6.54a	33.32a			-1.70c	26.32a	-23.76a	
Europe "Monetary Union"	0.00043	67.75	-79.8	0.24	0.69	8.72a	0.26	0.0004	136.82	-162.27	0.38
	1.80c	24.54a	-24.91a	2.00b	5.52a			1.78c	25.33a	-27.62a	
Europe "Emerging"	-0.00021	43.09	-39.23	0.11	0.88	3.51c	0.37	-0.00009	188.77	-194.13	0.19
	-0.97	31.81a	-27.77a	5.54a	42.99a			-0.44	19.71a	-21.67a	
Europe and Middle East	-0.00032	48.16	-43.21	0.11	0.87	2.39	0.22	-0.00015	173.92	-172.24	0.25
	-1.74c	32.47a	-29.78a	5.72a	49.58a			-0.88	23.19a	-23.59a	
Middle East and Africa	0.00113	56.96	-67.3	0.22	0.69	1.81	0.33	0.00037	175.38	-168.59	0.52
	1.44	8.41a	-9.56a	3.30a	8.37a			0.44	8.81a	-8.32a	
Latin America "Emerging"	0.00045	43.84	-45.67	0.18	0.75	9.39a	0.38	0.00086	135.83	-152.22	0.24
	0.97	14.34a	-17.30a	5.81a	25.00a			3.42a	23.85a	-24.40a	
North America	0.0001	73.12	-71.28	0.05	0.93	11.33a	0.42	0.00015	121	-117	0.42
	0.58	26.63a	-26.35a	3.96a	78.97a			0.85	27.39a	-25.90a	
	Model 1: Market-based CAPM							Model 2: International CAPM			
Block Indices	α	β_1	β_2	ω	ψ	WT	Adj R^2	α	β_1	β_2	Adj R^2
EAFE	0.00004	76.38	-79.71	0.17	0.77	12.43a	0.38	0	112.23	-113.58	0.47
	0.18	24.28a	-24.67a	3.50a	14.27a			-0.03	27.29a	-27.56a	
Composite "Emerging"	0.00018	64.5	-69.89	0.15	0.83	2.27	0.43	0.00018	132.98	-146.47	0.42
	0.97	21.09a	-19.53a	3.47a	20.62a			1.09	21.04a	-23.31a	
"Emerging Markets"	0.00031	62.8	-67.31	0.13	0.84	5.87b	0.33	0.00051	139.3	-167.44	0.27
	2.20b	31.07a	-30.74a	6.79a	39.95a			4.07a	27.05a	-29.70a	
G7	-0.00016	93.05	-89.59	0.15	0.8	9.86a	0.38	-0.0002	100.13	-94.39	0.49
	-1.04	28.01a	-25.65a	4.59a	20.58a			-1.24	28.52a	-26.09a	
World	-0.00007	97.62	-94.27	0.17	0.78	9.60a	0.22				
	-0.49	28.65a	-26.07a	4.19a	17.09a						

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