THE EFFECT OF FOREIGN INVESTMENTS ON THE VOLATILITY OF EMERGING STOCK MARKETS

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ABSTRACT

Foreign investors play an important role in emerging stock markets. When the economic or financial crisis begins in one of the emerging markets, foreign investors react immediately and selI the stocks not only in that country, but also in other emerging markets simultaneously. This causes all the emerging stock markets to spiral down and increases the volatility and foreign currency reserve problem. As a result, foreign investors view emerging market investments as different assets class and make comparison to each other, and not by comparing each market to the world portfolio.

Keywords: *Emerging Markets, Foreign Investments, Volatility, And Capital Asset Pricing Model.*

GELİŞMEKTE OLAN HİSSE SENEDİ PİYASALARINDAKİ DEĞİŞKENLİĞE YABANCI YATIRIMLARIN ETKİSİ

ÖZET

Yabancı yatırımcılar gelişmekte olan hisse senedi piyasalarında önemli rol oynamaktadırlar. Herhangi bir gelişmekte olan piyasada ekonomik veya finansal kriz başladığında, yabancı yatırımcılar çok hızlı reaksiyon göstererek sadece krizin çıktığı ülkede değil, diğer tüm gelişmekte olan ülkelerde de eşanlı olarak hisse senedi satışı yapmaktadırlar. Bunun sonucunda gelişmekte olan borsalarda önemli ölçüde düşüşler yaşanmakta, değişkenlik ve risklilik artmakta, satış sonrası yabancı yatırımcılar fonlarını çekip kendi ülkelerine götürmeleri döviz rezervi problemi de yaratabilmektedir. Sonuç olarak, yabancı yatırımcılar gelişmekte olan piyasaları ayrı bir finansal varlık olarak değerlendirmekte ve gelişmekte olan piyasaları kendi içinde değerlendirmekte, her bir gelişmekte olan piyasayı global portföy ile karşılaştırmamaktadırlar.

Anahtar Kelimeler: *Gelişmekte Olan Piyasalar, Yabancı Yatırımlar, Değişkenlik ve Sermaye Varlıklarını Fiyatlandırma Modeli.*

1. INTRODUCTION

For the last 15 years, astounding returns in emerging stock markets have drawn the attention of institutional investors in global financial markets that look for avenues to boost the performance of their stock portfolios. Through diversification of stock portfolios across countries, the global investors can reduce the portfolio risks due to the low correlation between developed and emerging stock markets. Based on prior research, the result displays four main differences between returns in emerging and developed stock markets: 1) average returns are higher in emerging stock markets, 2) volatility is higher in emerging stock markets, 3) correlation with developed market returns are lower, and 4) returns are more predictable in emerging stock markets.

As Hartmann and Khambata (1993) show that emerging stock markets are more volatile than developed stock markets, they tend to be relatively uncorrelated with developed stock markets. Drexhage (1999) mentions that this creates investment opportunities for global investors to gain benefits from portfolio diversification in emerging stock markets. However, this theory does not hold true at all times. The study of Bekaert, Harvey, and Lumsdaine (1998) indicates that emerging market returns have become more volatile and more highly correlated with the world market return when the emerging countries experience financial crises. This observation is also supported by the research done by Erb, Harvey and Viskanta (1994). Coppejans and Domowitz (2000) have identified large-scale foreign investment as the most likely suspect of creating big swings in the emerging stock markets. It is also observed that institutional investors have showed strong response of emerging stock markets to events in another emerging market, even when the events in the other country does not seem to affect economic fundamentals outside its own borders. As these emerging countries have big trade partners, it may have a substantial negative impact on their trade partners as economic crisis spread to other emerging countries. Examples of such behavior include the widespread selling of emerging market securities across the board in the immediate wake of the Mexican (1994), Turkish (1994 & 2001), Thai (1997), Indonesian (1998), Russian (1998), and Argentina (2000) financial crises. The contagion first creates immediate overreaction among emerging markets than developed markets. Developed markets generally react slowly due to its low volatility compared to emerging markets, except those developed markets that have huge trade or debt volume with specific emerging country will show immediate reaction. For instance, German stock market has more effect than U.S. and other developed markets after Russian rubble devaluation in 1998 and financial crises in Turkey in 2001. During the financial crises, both the integration level among the emerging markets and the correlation between emerging stock market returns are high. This eliminates the diversification benefits as the foreign institutional investors begin to sell almost all their stock holding simultaneously in the emerging markets that can increase the volatility. In addition, as Marer (2000) mentions that foreign investors transfer large amount of their money to their home country. As this huge outflow of fund occurs in a short time period, this can create financial crises and destroy emerging markets monetary policies and financial systems. Therefore, Zhang (2000) shows that having a sustainable macroeconomic policy framework and a healthy financial system in place is an important pre-condition for liberalizing foreign capital accounts.

The work of Khambata (2000), Demirguc and Huizinga (1993) states that the presence of foreign investors may have reduced rather than exacerbated volatility, consistent with the expectation that opening these markets allow risks to be spread more widely, which should reduce, not increase, the volatility of returns. Kim and Singal (2000) examine the benefits and risks associated with opening of stock markets. They find that stock returns increase immediately after opening without a concomitant increase in volatility. The evidence presented in Bekaert and Harvey (1997, 2000) suggests that there is no significant impact on volatility. Market integration sometimes leads to higher volatility and sometimes leads to lower volatility-it depends on the country. This result is consistent with the different theories of volatility.

On the other hand, the study of Frankel and Schmukler (1996) shows that not only the foreign investors increase the volatility but also the local investors. They investigate that, during the Mexican crisis in December 1994, local and foreign investors have diverse expectations but Mexican investors react before international investors to breaking news on Mexican economy. This implies that either domestic or international investors receive different set of information or the local investors are more sensitive to potential warning signals. In addition to that, Harvey indicates that liberalized equity markets to allow for the free flow of foreign portfolio investments tend to be more sensitive to the factors that may characterize a world asset pricing model.

Bekaert, Erb, Harvey and Viskanta explore the relation between risk variables and expected returns. They mentioned Harvey (1995) and Bekaert's (1995) findings that higher betas (from a capital asset pricing framework) are associated with lower expected returns. This is the opposite from the theory; however, it is consistent with these markets being segmented. That is, the countries with the higher betas are the ones that are more likely integrated; hence have lower expected returns relative to the segmented countries. it is most likely that many of these markets are not integrated into world capital markets. As a result, the beta suggested by the CAPM may not be that useful in explaining the cross-section of average returns. On the other hand, Whilborg (2004) paper indicates that beta is still a useful measure for risk for investors and portfolio managers to make investment decisions even in emerging markets.

2. METHODOLOGY

In order to evaluate the question of emerging market stocks are priced as a function of other emerging market stocks or world market portfolio; it is tested through Capital Asset Pricing Model (CAPM, which was developed by William Sharpe in 1964) by using methodology similar to Buckberg's research in 1996. Buckberg concentrates on Mexican financial crisis and works on 1989-1995 time period for 13 emerging equity markets. In our paper, it is tested whether Buckberg's approach is valid or not for different time periods that includes crisis effect on Thailand, Russia and Turkey for 24 emerging markets.

The World CAPM uses the world market as a benchmark. Beta is calculated as a measure of sensitivity to the risk of the world portfolio and is multiplied by the world risk premium, calculated as the difference between the expected return on the world portfolio and the risk-free asset (www.eerc.kiev.ua). As a result, according to the CAPM, it states that 1) the expected return on any individual stock should be proportional to its market exposure as measured by its beta, 2) the relationship between

required expected return and beta is linear, and 3) the rate of return on the market portfolio should be greater than the risk free rate.

3. EMPRICIAL RESULTS

For this purpose, single and multi factor models are applied and results are reported in the categorized models. Before testing CAPM to emerging equity markets, for the comparison purposes descriptive statistics of developed and emerging markets are applied. The monthly index return data are retrieved from Morgan Stanley Capital Investment (MSCI) (in U.S. dollars). The time period reviewed for the study is from 1993 to 2005. Table 1 and Table 2 provide a summary statistics of international equity returns (24 emerging and 22 developed markets) that demonstrates the behavior of these markets. The average monthly return in the emerging markets range from 1.73% (in Hungary) to -0.91% (in China) through January 1993 to March 2005. The range relatively contrasts with the range of average return in the developed markets. For the developed markets, as it is seen in Table 2, the average monthly return is Switzerland of 0.91% and the lowest monthly return is Japan of -0.26%.

For emerging markets, the volatility ranges from 4.64% (in Jordan) to 19.38% (in Russia). For developed markets, the volatility ranges from 4.21% (in U.S.) to 9.86% (in Finland). The volatility is much higher in most emerging countries compared to developed countries. In other words, the monthly index returns in emerging markets fluctuate more drastically than the developed markets. For instance, the highest monthly index return is Poland of 78.07% while the lowest monthly index return is Russia of -93.07%. Where as for developed countries, Hong Kong has the highest monthly index return of 28.37% and Finland has the lowest monthly index return of -38.23%.

The excess index returns correlation coefficients between emerging markets and World Portfolio, Emerging Composite, Asia, Latin America, and EMEA[1] are presented in Table 3. We observe that the correlation coefficients are generally higher between regional countries and emerging regional index. For instance, over the sample period Malaysia (0.773) and Thailand (0.760) have the highest correlations with Emerging Asian Index. Similarly, Brazil (0.899) and Mexico (0.856) markets are positive and higher correlations between Emerging Latin America Index. In addition, all the emerging markets index returns have positive correlations with Emerging Composite, Emerging Asia, Emerging Latin America and Emerging EMEA index returns.

Graph 1. demonstrates how the correlation coefficients changes through time between the world returns and some emerging markets namely Thailand, Russia and Turkey which had experienced financial crisis. Graph 2. provides changing correlations between Turkey-Thailand, Thailand-Russia, and Turkey-Russia.

All the emerging countries' stock market returns may not be correctly represented in Investable Composite Index. Emerging markets indexes from S&P and MSCI are weighted by market capitalization, which raises some biases (Tokat, 2004):

- Differences across countries in the proportion of firms that are publicly traded may result in a concentration in certain countries.

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[1] EMEA represents Europe Middle East and Africa.

- The strict limits on foreign investors that some countries impose may result in these countries beign underweighted in investable as compared with local indexes. Investable emerging markets indexes include in market capitalization only those shares legally and practically available to foreign investors.

- The entry or exit of countries may alter index weightings significantly at the date of change.

3.1. One-Factor Model

For the one-factor model, the monthly index return data for twenty four emerging markets and world portfolio return data are retrieved from Morgan Stanley Capital Investment (MSCI) (in U.S. dollars). The time period reviewed for the study is from 1993 to 2005. The time period includes 1997 Thai, 1998 Russian and 2001 Turkish financial crisis. All returns are based on the excess return of one-month U.S. Treasury bill.

In the one-factor model, the return in individual emerging stock market depends on the world market return and is tested as follows:

$$R_{j,t} = \alpha + \beta_w R_{w,t} + e_t \qquad (1)$$

Where

$R_{j,t}$ = expected return on market j ,

$R_{w,t}$ = expected return on the world portfolio.

An estimated one-factor model for emerging markets is shown in Table 4 with the calculation of *t* statistics to determine the significance. Among the emerging markets, 20 of them have significant exposure to the world return while only fifteen of the emerging markets have betas greater than unity (Argentina, Brazil, China, Hungary, Indonesia, Israel, South Korea, Mexico, Poland, Russia. South Africa, Taiwan. Thailand, Turkey, and Venezuela). This suggests that most of the emerging markets are integrated with the world markets that reduce the benefits of emerging market diversification through time.

Colombia, Egypt, Jordan, and Pakistan stock market returns' have insignificant exposure to the world return at 5% significant level. These results can be reached from the F values. Moreover Egypt, Indonesia, Jordan, Malaysia, and Venezuela's data have showed serial correlations and this is eliminated by using Cochrane-Orcutt iteration method.

3.2. Two-Factor Model

The return in emerging stock market *j* depends both on the world market return and emerging market return and is formulated as follows:

$$R_{j,t} = \alpha + \beta_w R_{w,t} + \beta_{em} + R_{em,t} + e_t \qquad (2)$$

Where

$R_{j,t}$ = expected return on market j,

$R_{w,t}$ = expected return on the world portfolio,

$R_{em,t}$ = expected return on the world International Finance Corporation Investable Composite Index.

For the two-factor model, the monthly index return data for emerging markets and investable composite index and world portfolio return data are retrieved from MSCI web sites. The time period reviewed for the study is from 1993 to 2005. Due to the financial crisis in Thailand (1997) and Turkey (2001), estimations are done for three sub time periods. These are; 1993-1997, 1997-2001, and 2001-2005. All returns are calcu1ated in excess of the holding yield on a constant one-month maturity U.S. Treasury bill representing the riskless rate of return.

The ordinary least squares (OLS) estimate of the two-factor model over the full sample period of 1993-2005 shown in Table 5 indicates that the addition of the emerging country market portfolio substantially improves the explanation of returns in individual emerging stock markets relative to the one-factor CAPM. The estimated two-factor model explains up to 58% of returns variation in individual markets with the highest explanatory power in some of the largest and most liquid markets such as Brazil, Chile, Mexico, and South Africa. In addition to that, India, Israel, and Pakistan, are more sensitive to the world portfolio return.

In order to estimate two-factor model coefficients before Thailand financial crisis in 1997, the OLS regression are applied through 1993 to 1997. Table 6 presents the two-factor model OLS results. Malaysia, Mexico, Philippines, and Thailand have the highest explanatory power. Furthermore, Argentina, Czech Republic, and Israel are more sensitive to the world portfolio return.

Similarly, to estimate two-factor model coefficients before Turkish financial crisis in 2001 and how emerging stock markets are affected by Thailand financial crisis. The OLS regressions are applied from 1997 to 2001. Table 7 shows that Argentina, Brazil, Chile, Hungary, Mexico, Russia, South Africa, and Taiwan have relatively higher R^2 numbers.

Lately, to indicate Turkish financial crisis affect on the other emerging markets, OLS method is applied for 2001-2005 time period. From the Table 8 Brazil, Chile, South Korea, Mexico, Poland, South Africa, Taiwan, and Turkey have the highest explanatory power. Emerging markets somehow affected by Turkish financial crisis, yet Thailand financial crisis has more impact than Turkish crisis. Moreover, Brazil, Israel, and Taiwan are more sensitive to the world portfolio return.

These results conclude that the returns in emerging markets are more sensitive to changes in returns on the composite emerging country stock portfolio than the world portfolio. As a result, global investors should view emerging markets as different assets class and make comparison to each other, and not by comparing each market to the world portfolio. Based on the findings, the two-factor model is more appropriate in describing the emerging market asset pricing in the time period from 1993 to 2005.

3.3. Five-Factor Model

Each individual country's return is a function of its own regional market. For Example, Malaysia has significant beta with Asia portfolio, but not Latin America. In this study, CAPM test is based on three regions (Asia, Latin America, and EMEA), emerging composite, and world. The monthly return used is from the time period January 1993 to March 2005. The equation for five-factor model is as follows:

$$R_{j,t} = \alpha + \beta_w R_{w,t} + \beta_{em} R_{em,t} + \beta_{Asia} R_{Asia,t} + \beta_{LatAm} R_{LatAm,t} + \beta_{EMEA} R_{EMEA,t} + e_t \quad (3)$$

Where

$R_{Asia,t}$ = return on an Asian portfolio,

$R_{LatAm,t}$ = return on a Latin American portfolio,

$R_{EMEA,t}$ = return on an EMEA portfolio.

All returns are based on the excess return of one-month U.S. Treasury bill. The OLS estimation of five-factor model results is shown in Table 9. The regional portfolio only has explanatory power for returns in Brazil, Chile, South Korea, Malaysia, Pakistan, Poland, South Africa, and Thailand. However, Brazil, Mexico, South Africa and Turkey stock market returns have explanatory power for returns in Asian markets. Pakistan stock market return has explanatory power for returns in Latin American markets. Mexico, Pakistan and Taiwan stock return has a significant effect on EMEA markets but Latin America portfolio return is not statistically significant in explaining Mexican returns.

Five-factor model is tested to determine if emerging stock markets are priced as a function of other developed stock markets. U.S., U.K., and Japan have the first three biggest stock markets in the world in terms of market capitalization and daily trade volume. Therefore, in this model, the most developed markets portfolio are used, instead of regional portfolio, as follows:

$$R_{j,t} = \alpha + \beta_w R_{w,t} + \beta_{em} R_{em,t} + \beta_{US} R_{US,t} + \beta_{Japan} R_{Japan,t} + \beta_{UK} R_{UK,t} + e_t \qquad (4)$$

Where

$R_{US,t}$ = return on a U.S. portfolio,

$R_{Japan,t}$ = return on a Japan portfolio.

$R_{UK,t}$ = return on a U.K. portfolio.

The OLS estimation results are shown in Table 10 and conclude that the addition of the returns on a U.S., Japan, and U.K. market portfolio do not improve the explanation of returns behavior in emerging markets. Furthermore, U.K. stock market has explanatory power for stock market returns in Brazil, Czech Republic, Egypt, Israel, and Malaysia. Similarly, U.S. stock market returns have explanatory power for stock market returns in Brazil, Czech Republic, Egypt, Hungary, and Malaysia. Finally, only Chinese stock market returns have significant effects on Japan stock market returns.

4. VOLATILITY ESTIMATION

Finally, volatility regression model is estimated using monthly returns (Aggarwal and Leal, 1997; 140-145). Volatility is measured by standard deviation during the 1993-2005. The independent variables are World, Emerging Markets, Asian, Latin American, EMEA, U.S., Japan, and U.K. indexes. Therefore,

$$\sigma_{j,t} = \alpha + \beta_w \sigma_{w,t} + \beta_{em} \sigma_{em,t} + \beta_{us} \sigma_{us,t} + \beta_{japan} \sigma_{japan,t} + \beta_{UK} \sigma_{UK,t} + e_t \qquad (5)$$

Where $\sigma_{j,t}$ represents the variance based on monthly returns for an emerging market index. For instance σ_{us} represents the corresponding variance for the U.S. stock market. When the above regressions are repeated to examine the relationship between the volatility of the markets by using the standard deviation of returns as the variable, the results are even stronger as it is seen in Table 11. Almost all of the emerging markets, except Turkey, have significant relationships with the developed markets of the U.S.

U.K. and Japan. There is a strong relationship between U.S., U.K., and Japan stock markets volatility with emerging markets.

Graph 3. demonstrates comparioson of volatility changes through time for the emerging countries which had experienced financial crisis and the world stock market return volatility. As it is shown on the same graph, volatility tends to increase during the financial crisis period. For instance, Russian monthly stock return volatility increases above 40% during the crisis period of 1998. For Thailand at the end of 1997 monthly volatility estimation jumps from 10% to 25%. For Turkey, stock market volatility moves above 25% after February 2001 when the financial crisis happened.

5. CONCLUSION

This paper analyzes the behavior of foreign investors toward emerging stock markets investments with an observation and evaluation of twenty five emerging stock markets. The emerging market stocks are priced as a function of other emerging market stocks or world market portfolio is tested through Capital Asset Pricing Model. The ordinary least squares (OLS) apply to an estimate of the one, two, and five-factor model.

The result from the one- factor model, that is the return in individual emerging stock market depends on the world market return, is likely to have a slight relation between expected returns and risk exposure. The two-factor model results shows that the return in emerging stock market depends on changes in returns on the composite emerging stock portfolio than to the world portfolio. This result is also supported by the idea of foreign institutional investors' behavior. Foreign institutional investors view emerging markets as different assets class and make comparison to each other, and not by comparing each market to the world portfolio. Based on the findings, the two-factor model is more appropriate in describing the emerging market asset pricing in the time period from 1993 to 2005. In addition, even though emerging markets somehow affected by Turkish financial crisis, yet Thailand financial crisis has more impact on other emerging markets than Turkish crisis due to the contagious effect.

The five factor model is applied to test each individual country's return is a function of its own regional market and the result varies in some emerging stock markets returns. Finally, volatility regression model is estimated using monthly returns. Almost all of the emerging markets, except Turkey, have significant relationships with the developed markets of the U.S. U.K. and Japan stock market volatility. It is observed that volatility has increased significantly post period of financial crisis.

All these findings show the result of foreign institutional investors' reaction through emerging market investments as different assets class; therefore, they buy and sell at the same time and during the financial crisis in any emerging market, they react simultaneously that increase the volatility of most of these emerging stock markets.

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Table 1: Summary Statistics of Emerging Markets Equity Returns, 1993-2005

Markets	N	Lowest Returns (%)	Highest Returns (%)	Arithmetic Mean (%)	Std. Deviation (%)	Skewness	Kurtosis
Argentina	146	-38.43	42.47	0.27	11.20	-0.324	2.184
Brazil	146	-49.44	31.12	1.06	12.29	-0.822	2.451
Chile	146	-34.40	18.28	0.46	7.25	-0.767	2.993
China	146	-32.40	38.18	-0.91	11.18	0.317	1.444
Colombia	146	-27.59	26.47	0.68	9.35	-0.21	0.843
Czech Republic	122	-32.40	26.30	1.02	8.66	-0.512	1.643
Egypt	122	-15.11	35.08	1.22	8.79	0.881	1.604
Hungary	122	-49.09	37.96	1.73	10.66	-0.749	4.566
India	146	-19.53	19.89	0.46	8.36	-0.072	-0.401
Indonesia	146	-52.47	44.20	-0.17	14.80	-0.379	1.913
Israel	146	-20.94	23.86	0.36	7.80	-0.371	0.433
Jordan	146	-9.20	15.58	0.62	4.64	0.519	0.276
Korea	146	-37.48	53.41	0.47	12.15	0.322	2.992
Malaysia	146	-36.11	40.51	0.06	10.22	-0.097	3.099
Mexico	146	-41.95	17.42	0.53	9.82	-1.348	3.648
Pakistan	146	-47.62	31.68	0.14	11.70	-0.264	2.083
Philippines	146	-34.65	36.01	-0.41	10.06	0.161	2.017
Poland	146	-42.98	78.07	1.45	13.69	0.994	6.661
Russia	122	-93.07	47.71	1.40	19.38	-1.019	4.262
South Africa	146	-36.88	19.28	0.78	8.02	-1.088	3.460
Taiwan	146	-24.68	38.14	0.32	9.66	0.542	1.462
Thailand	146	-41.63	35.90	-0.34	13.16	-0.232	1.378
Turkey	146	-53.18	54.41	1.11	17.44	-0.277	0.907
Venezuela	146	-63.77	48.04	0.24	14.94	-0.804	3.774
EMERGING MARKETS	146	-34.65	15.23	0.43	6.83	-1.231	4.233
EM_ASIA	146	-21.90	19.95	0.11	7.69	-0.229	0.674
EM_EMEA	98	-37.06	16.70	0.70	7.60	-1.662	5.531
EM LATIN AMERICA	146	-43.66	18.27	0.69	8.59	-1.274	4.158
WORLD	146	-14.45	8.53	0.59	4.07	-0.771	0.960

Table 2: Summary Statistics of Developed Markets Equity Returns, 1989-2005

Markets	N	Lowest Returns (%)	Highest Returns (%)	Arithmetic Mean (%)	Std. Deviation (%)	Skewness	Kurtosis
Australia	194	-16.57	13.19	0.51	5.24	-0.411	0.407
Austria	194	-26.66	22.54	0.74	6.68	-0.367	1.961
Belgium	194	-20.84	16.16	0.54	5.04	-0.764	2.350
Canada	194	-24.74	13.45	0.59	5.16	-0.953	2.887
Denmark	194	-14.48	13.73	0.82	5.36	-0.300	-0.040
Finland	194	-38.23	28.04	0.76	9.86	-0.291	1.257
France	194	-16.65	14.24	0.67	5.40	-0.343	0.486
Germany	194	-27.91	20.20	0.58	6.51	-0.740	2.571
Hong Kong	194	-34.41	28.37	0.68	8.03	-0.168	2.101
Ireland	194	-19.63	16.68	0.60	5.76	-0.363	1.168
Italy	194	-20.96	19.40	0.43	6.81	-0.012	0.219
Japan	194	-21.60	21.66	-0.26	6.77	0.150	0.517
Netherlands	194	-19.62	12.16	0.69	5.05	-0.975	2.235
New Zealand	194	-22.82	24.08	0.29	6.57	-0.238	1.031
Norway	194	-32.71	15.38	0.64	6.80	-0.679	2.126
Portugal	194	-21.51	25.00	0.36	6.47	0.095	1.206
Singapore	194	-23.08	22.84	0.43	7.33	-0.457	2.235
Spain	194	-24.52	19.37	0.61	6.49	-0.403	1.241
Sweden	194	-25.46	20.55	0.83	7.56	-0.486	0.990
Switzerland	194	-17.11	15.24	0.91	5.05	-0.360	1.079
UK	194	-11.12	13.80	0.55	4.61	0.044	0.092
USA	194	-15.11	10.57	0.76	4.21	-0.563	0.817
WORLD	194	-14.45	10.56	0.45	4.21	-0.514	0.696

Table 3: Correlation between Emerging Markets and World Portfolio, EM, Asia, Latin America, and EMEA

Markets	WORLD	EM	EM_ASIA	EM LATIN AMERICA	EM_EMEA
Argentina	0.412	0.598	0.415	0.659	0.499
Brazil	0.582	0.729	0.452	0.899	0.688
Chile	0.552	0.765	0.623	0.744	0.730
China	0.381	0.619	0.630	0.483	0.479
Colombia	0.190	0.353	0.277	0.351	0.367
Czech Republic	0.307	0.518	0.427	0.424	0.585
Egypt	0.211	0.306	0.292	0.210	0.375
Hungary	0.524	0.650	0.467	0.614	0.723
India	0.267	0.502	0.496	0.393	0.463
Indonesia	0.379	0.561	0.597	0.422	0.415
Israel	0.541	0.483	0.324	0.466	0.574
Jordan	0.147	0.194	0.199	0.141	0.187
Korea	0.474	0.547	0.643	0.359	0.414
Malaysia	0.381	0.623	0.773	0.373	0.432
Mexico	0.567	0.766	0.501	0.856	0.756
Pakistan	0.100	0.357	0.329	0.315	0.322
Philippines	0.412	0.612	0.682	0.433	0.439
Poland	0.409	0.531	0.457	0.453	0.692
Russia	0.468	0.669	0.517	0.620	0.732
South Africa	0.539	0.710	0.599	0.565	0.851
Taiwan	0.454	0.656	0.705	0.489	0.520
Thailand	0.477	0.664	0.760	0.457	0.473
Turkey	0.452	0.515	0.345	0.445	0.666
Venezuela	0.260	0.375	0.312	0.330	0.449
WORLD	1.000	0.732	0.614	0.670	0.727
EM	0.732	1.000	0.872	0.880	0.882
EM_ASIA	0.614	0.872	1.000	0.590	0.654
EM LATIN AMERICA	0.670	0.880	0.590	1.000	0.801
EM_EMEA	0.727	0.882	0.654	0.801	1.000

Table 4: One-Factor Model for Emerging Markets, 1993-2005

Markets		Constant (t-stat.)	World (t-stat.)	Adj. R²	DW	F (p-value)
Argentina	Coeff	-0.004	1.135	0.164	2.068	29.415
	T-Stat	-0.419	5.424			0.000
Brazil	Coeff	0.003	1.760	0.334	2.014	73.719
	T-Stat	0.307	8.586			0.000
Chile	Coeff	-0.001	0.985	0.300	1.846	63.013
	T-Stat	-0.251	7.938			0.000
China	Coeff	-0.015	1.048	0.139	1.885	24.437
	T-Stat	-1.755	4.943			0.000
Colombia	Coeff	0.003	0.323	0.014	1.977	3.078
	T-Stat	0.378	1.755			0.081
Czech Rep.	Coeff	0.006	0.634	0.087	1.958	12.493
	T-Stat	0.759	3.535			0.001
Egypt	Coeff	0.005	0.316	0.018	2.037	3.273
	T-Stat	0.786	1.809			0.073
Hungary	Coeff	0.011	1.329	0.269	2.031	45.540
	T-Stat	1.374	6.748			0.000
India	Coeff	0.000	0.551	0.065	1.928	11.074
	T-Stat	-0.010	3.328			0.001
Indonesia	Coeff	-0.007	1.325	0.134	1.941	23.449
	T-Stat	-0.634	4.842			0.000
Israel	Coeff	-0.023	1.037	0.288	1.978	59.513
	T-Stat	-0.436	7.714			0.000
Jordan	Coeff	0.001	0.094	0.0009	1.972	1.130
	T-Stat	0.405	1.063			0.289
S. Korea	Coeff	-0.023	1.417	0.219	1.871	41.674
	T-Stat	-0.268	6.456			0.000
Malaysia	Coeff	-0.004	0.923	0.137	2.074	24.016
	T-Stat	-0.517	4.900			0.000
Mexico	Coeff	-0.001	1.377	0.325	2.034	70.229
	T-Stat	-0.146	8.380			0.000
Pakistan	Coeff	-0.002	0.287	0.003	2.007	1.444
	T-Stat	1.202	1.202			0.232
Philippines	Coeff	-0.009	0.981	0.159	1.999	28.256
	T-Stat	-1.127	5.316			0.000
Poland	Coeff	0.008	1.377	0.162	2.024	28.942
	T-Stat	0.728	5.380			0.000
Russia	Coeff	0.007	2.107	0.212	1.984	33.235
	T-Stat	0.473	5.765			0.000
S. Africa	Coeff	0.001	1.059	0.283	2.009	57.960
	T-Stat	0.242	7.613			0.000
Taiwan	Coeff	-0.003	1.080	0.201	1.931	37.459
	T-Stat	-0.409	6.120			0.000
Thailand	Coeff	-0.011	1.547	0.222	1.799	42.490
	T-Stat	-1.125	6.518			0.000
Turkey	Coeff	0.003	1.937	0.199	2.070	36.944
	T-Stat	0.200	6.078			0.000
Venezuela	Coeff	-0.003	1.026	0.079	1.993	13.423
	T-Stat	-0.293	3.663			0.000

Table 5: Two-Factor Model for Emerging Markets, 1993-2005

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	Adj. R²	DW	F (p-value)
Argentina	Coeff	-0.001	-0.155	1.046	0.351	2.047	40.132
	T-Stat	-0.160	-0.574	6.511			0.000
Brazil	Coeff	0.005	0.314	1.171	0.530	2.264	82.791
	T-Stat	0.744	1.242	7.816			0.000
Chile	Coeff	0.001	-0.032	0.825	0.580	1.956	101.084
	T-Stat	0.154	-0.230	9.854			0.000
China	Coeff	-0.012	-0.427	1.195	0.386	2.041	46.485
	T-Stat	-1.704	-1.624	7.664			0.000
Colombia	Coeff	0.004	-0.341	0.631	0.123	1.797	11.136
	T-Stat	0.535	-1.295	4.040			0.000
Czech Rep.	Coeff	0.009	-0.448	0.845	0.276	2.157	24.076
	T-Stat	1.400	-1.803	5.691			0.000
Egypt	Coeff	0.007	-0.199	0.412	0.057	2.013	4.641
	T-Stat	0.951	-0.714	2.396			0.011
Hungary	Coeff	0.015	0.164	0.910	0.415	2.066	43.855
	T-Stat	2.067	0.599	5.554			0.000
India	Coeff	0.002	-0.469	0.856	0.315	1.980	34.168
	T-Stat	0.382	-2.268	7.143			0.000
Indonesia	Coeff	-0.006	-0.223	1.289	0.296	1.974	31.300
	T-Stat	-0.537	-0.597	5.777			0.000
Israel	Coeff	-0.002	0.775	0.213	0.299	2.021	31.919
	T-Stat	-0.351	3.958	1.831			0.000
Jordan	Coeff	0.002	-0.028	0.102	0.005	1.962	1.370
	T-Stat	0.457	-0.206	1.241			0.258
S. Korea	Coeff	-0.001	0.470	0.767	0.302	2.113	32.305
	T-Stat	-0.078	1.544	4.244			0.000
Malaysia	Coeff	-0.003	-0.408	1.107	0.392	1.938	47.753
	T-Stat	-0.405	-1.706	7.805			0.000
Mexico	Coeff	0.001	0.033	1.084	0.581	1.911	101.444
	T-Stat	0.165	0.172	9.577			0.000
Pakistan	Coeff	0.000	-1.080	1.099	0.209	2.015	20.005
	T-Stat	-0.010	-3.523	6.180			0.000
Philippines	Coeff	-0.008	-0.192	0.982	0.368	2.016	43.216
	T-Stat	-1.176	-0.799	6.895			0.000
Poland	Coeff	0.010	0.147	0.997	0.273	2.054	28.224
	T-Stat	1.013	0.420	4.803			0.000
Russia	Coeff	0.015	-0.487	2.062	0.443	1.936	49.026
	T-Stat	1.164	-1.003	7.105			0.000
S. Africa	Coeff	0.003	0.081	0.796	0.495	2.133	71.602
	T-Stat	0.720	0.474	7.807			0.000
Taiwan	Coeff	-0.001	-0.131	0.981	0.423	2.120	54.231
	T-Stat	-0.117	-0.596	7.520			0.000
Thailand	Coeff	-0.008	-0.060	1.302	0.433	2.117	56.374
	T-Stat	-0.959	-0.202	7.381			0.000
Turkey	Coeff	0.005	0.694	1.007	0.267	2.101	27.390
	T-Stat	0.392	1.552	3.795			0.000
Venezuela	Coeff	-0.001	0.068	0.766	0.143	2.004	13.050
	T-Stat	-0.105	0.175	3.428			0.000

Table 7: Two-Factor Model for Emerging Markets, 1997-2001

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	Adj. R²	DW	F (p-value)
Argentina	Coeff	0.006	-0.189	1.057	0.650	1.940	46.441
	T-Stat	0.600	-0.628	6.718			0.000
Brazil	Coeff	0.009	0.009	1.334	0.693	1.613	56.349
	T-Stat	0.775	0.023	6.776			0.000
Chile	Coeff	0.002	-0.368	0.979	0.775	2.082	85.484
	T-Stat	0.426	-1.925	9.755			0.000
China	Coeff	-0.012	-0.657	1.268	0.349	1.929	14.134
	T-Stat	-0.700	-1.144	4.202			0.000
Colombia	Coeff	-0.012	-0.709	0.698	0.098	1.883	3.665
	T-Stat	-0.781	-1.356	2.542			0.033
Czech Rep.	Coeff	-0.002	-0.238	0.697	0.208	2.322	7.447
	T-Stat	-0.139	-0.510	2.840			0.002
Egypt	Coeff	-0.003	-0.330	0.537	0.120	1.465	4.331
	T-Stat	-0.258	-0.781	2.416			0.019
Hungary	Coeff	0.005	0.844	0.637	0.473	2.217	22.997
	T-Stat	0.334	1.890	2.716			0.000
India	Coeff	0.010	-0.589	0.774	0.245	2.397	8.948
	T-Stat	0.810	-1.465	3.665			0.001
Indonesia	Coeff	-0.031	0.263	1.360	0.347	1.832	14.018
	T-Stat	-1.234	0.319	3.137			0.000
Israel	Coeff	0.011	0.369	0.315	0.247	1.978	9.027
	T-Stat	1.058	1.099	1.782			0.000
Jordan	Coeff	-0.012	0.144	0.010	-0.003	1.433	0.925
	T-Stat	-2.199	0.787	0.105			0.404
S. Korea	Coeff	-0.002	0.761	0.660	0.217	2.188	7.774
	T-Stat	-0.085	1.009	1.664			0.001
Malaysia	Coeff	-0.008	-0.552	1.330	0.419	1.932	18.704
	T-Stat	-0.470	-1.012	4.638			0.000
Mexico	Coeff	0.012	0.413	0.911	0.719	1.896	63.688
	T-Stat	1.410	1.442	6.055			0.000
Pakistan	Coeff	-0.003	-1.226	1.044	0.134	2.428	4.792
	T-Stat	-0.137	-1.860	3.013			0.013
Philippines	Coeff	-0.023	0.369	0.862	0.444	1.603	20.577
	T-Stat	-1.589	0.782	3.474			0.000
Poland	Coeff	-0.002	0.267	0.765	0.379	2.095	15.977
	T-Stat	-0.164	0.579	3.153			0.000
Russia	Coeff	0.015	0.435	2.028	0.568	2.061	33.166
	T-Stat	0.600	0.540	4.785			0.000
S. Africa	Coeff	0.000	-0.017	0.903	0.631	2.123	42.045
	T-Stat	-0.020	-0.055	5.869			0.000
Taiwan	Coeff	0.001	-0.452	1.061	0.538	2.467	29.559
	T-Stat	0.143	-1.311	5.856			0.000
Thailand	Coeff	-0.023	0.609	1.160	0.432	1.948	19.654
	T-Stat	-1.125	0.904	3.276			0.000
Turkey	Coeff	0.006	0.776	0.749	0.206	1.914	7.367
	T-Stat	0.233	0.916	1.682			0.002
Venezuela	Coeff	0.000	-0.138	1.017	0.314	2.025	12.217
	T-Stat	0.009	-0.242	3.477			0.000

Table 8: Two-Factor Model for Emerging Markets, 2001-2005

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	Adj. R²	DW	F (p-value)
Argentina	Coeff	-0.014	-1.080	1.490	0.122	1.684	4.262
	T-Stat	-0.722	-1.327	2.459			0.020
Brazil	Coeff	0.001	0.960	0.864	0.678	1.852	50.590
	T-Stat	0.045	2.238	2.767			0.000
Chile	Coeff	0.004	0.474	0.547	0.593	2.229	35.267
	T-Stat	0.684	1.718	2.668			0.000
China	Coeff	-0.004	0.460	0.560	0.416	2.142	17.761
	T-Stat	-0.426	1.181	1.931			0.000
Colombia	Coeff	0.027	-0.015	0.735	0.239	2.035	8.375
	T-Stat	2.400	-0.032	2.094			0.001
Czech Rep.	Coeff	0.020	-0.482	0.982	0.388	2.116	15.899
	T-Stat	2.622	-1.466	4.015			0.000
Egypt	Coeff	0.021	-0.031	0.456	0.037	1.487	1.909
	T-Stat	1.481	-0.052	1.031			0.160
Hungary	Coeff	0.022	0.100	0.634	0.336	1.809	12.885
	T-Stat	2.538	0.274	2.323			0.000
India	Coeff	-0.002	-0.429	1.098	0.434	2.064	18.995
	T-Stat	-0.231	-1.184	4.077			0.000
Indonesia	Coeff	0.012	-0.520	0.917	0.074	1.786	2.890
	T-Stat	0.749	-0.765	1.811			0.066
Israel	Coeff	0.001	1.548	-0.151	0.529	1.939	28.497
	T-Stat	0.067	4.436	-0.592			0.000
Jordan	Coeff	0.024	0.039	0.162	0.017	1.902	1.404
	T-Stat	3.416	0.131	0.731			0.256
S. Korea	Coeff	0.004	-0.140	1.352	0.733	1.826	65.604
	T-Stat	0.636	-0.477	6.191			0.000
Malaysia	Coeff	-0.004	-0.597	0.856	0.296	1.815	10.870
	T-Stat	-0.615	-1.998	3.852			0.000
Mexico	Coeff	0.006	0.302	0.667	0.685	1.849	52.044
	T-Stat	1.035	1.335	3.956			0.000
Pakistan	Coeff	0.009	-1.117	1.278	0.121	2.171	4.220
	T-Stat	0.600	-1.742	2.678			0.021
Philippines	Coeff	-0.007	-0.266	0.587	0.083	2.209	3.134
	T-Stat	-0.666	-0.586	1.735			0.053
Poland	Coeff	0.004	0.291	0.868	0.499	2.098	24.431
	T-Stat	0.434	0.720	2.889			0.000
Russia	Coeff	0.011	-0.507	1.226	0.367	2.139	14.606
	T-Stat	1.031	-1.120	3.637			0.000
S. Africa	Coeff	0.002	-0.141	0.994	0.507	1.915	24.611
	T-Stat	0.241	-0.413	3.886			0.000
Taiwan	Coeff	-0.016	-0.703	1.547	0.627	2.422	40.489
	T-Stat	-2.000	-2.107	6.237			0.000
Thailand	Coeff	0.011	-0.207	1.010	0.423	2.041	18.205
	T-Stat	1.065	-0.508	3.378			0.000
Turkey	Coeff	0.001	0.787	1.479	0.588	2.196	34.557
	T-Stat	0.052	1.158	2.981			0.000
Venezuela	Coeff	0.004	1.081	-0.133	0.065	2.105	2.621
	T-Stat	0.185	1.342	-0.222			0.084

Table 9: Five-Factor Model for Emerging Markets, 1993-2005

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	Asia (t-stat)	Latin America (t-stat.)	EMEA (t-stat.)	Adj. R^2	DW	F (p-value)
Argentina	Coeff	-0.005	-0.685	0.771	-0.223	0.781	-0.192	0.411	1.843	14.562
	T-Stat	-0.498	-1.984	0.530	-0.355	1.633	-0.398			0.000
Brazil	Coeff	-0.004	0.052	-1.907	0.684	2.146	0.259	0.908	2.134	192.808
	T-Stat	-0.995	0.348	-3.051	2.532	10.436	1.247			0.000
Chile	Coeff	0.000	-0.146	0.220	0.152	0.439	0.061	0.720	2.353	50.819
	T-Stat	-0.083	-0.976	0.349	0.557	2.118	0.290			0.000
China	Coeff	-0.010	-0.263	-0.038	0.732	0.331	0.050	0.378	2.020	12.769
	T-Stat	-1.043	-0.751	-0.026	1.150	0.683	0.102			0.000
Colombia	Coeff	0.005	-0.550	0.960	-0.299	0.175	-0.066	0.157	1.989	4.610
	T-Stat	0.486	-1.555	0.645	-0.465	0.358	-0.133			0.001
Czech Rep.	Coeff	0.008	-0.408	0.953	-0.224	-0.320	0.519	0.337	2.111	10.846
	T-Stat	1.079	-1.466	0.814	-0.443	-0.832	1.335			0.000
Egypt	Coeff	0.006	-0.221	1.256	0.053	-0.378	0.156	0.177	2.013	2.746
	T-Stat	0.503	-0.702	0.542	0.095	-0.912	0.373			0.023
Hungary	Coeff	0.010	0.229	0.941	-0.448	-0.184	0.560	0.509	1.945	21.097
	T-Stat	1.304	0.848	0.827	-0.910	-0.491	1.483			0.000
India	Coeff	0.006	-0.302	-0.316	0.654	0.125	0.341	0.314	2.328	9.863
	T-Stat	0.889	-1.144	-0.285	1.361	0.343	0.923			0.000
Indonesia	Coeff	-0.007	-0.380	-1.447	1.804	0.555	0.542	0.329	1.991	10.525
	T-Stat	-0.458	-0.726	-0.657	1.893	0.766	0.741			0.000
Israel	Coeff	0.001	0.816	0.544	-0.374	-0.186	0.235	0.379	1.909	12.862
	T-Stat	0.138	3.407	0.540	-0.858	-0.562	0.702			0.000
Jordan	Coeff	0.007	0.027	0.218	0.009	-0.118	-0.028	0.100	2.062	0.619
	T-Stat	1.154	0.165	0.330	0.030	-0.542	-0.127			0.686

Table 9: Five-Factor Model for Emerging Markets, 1993-2005 Continued

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	Asia (t-stat)	Latin America (t-stat.)	EMEA (t-stat.)	Adj. R²	DW	F (p-value)
S. Korea	Coeff	0.013	0.756	-1.968	2.223	0.161	0.364	0.590	2.171	37.677
	T-Stat	1.960	2.488	-1.458	3.889	0.365	0.801			0.000
Malaysia	Coeff	-0.003	-0.569	-0.778	1.510	0.218	0.279	0.552	2.111	24.927
	T-Stat	-0.366	-2.019	-0.657	2.946	0.559	0.709			0.000
Mexico	Coeff	0.006	0.173	1.916	-0.795	0.152	-0.439	0.801	2.193	79.243
	T-Stat	1.322	1.151	3.025	-2.902	0.730	-2.087			0.000
Pakistan	Coeff	0.001	-1.377	-3.059	1.631	1.354	1.347	0.183	2.356	5.357
	T-Stat	0.075	-3.169	-1.674	2.063	2.251	2.219			0.000
Philippines	Coeff	-0.012	0.017	0.533	0.567	-0.103	-0.162	0.388	1.922	13.288
	T-Stat	-1.368	0.053	0.405	0.996	-0.237	-0.372			0.000
Poland	Coeff	-0.001	0.178	-1.523	0.915	0.347	1.241	0.494	2.061	19.932
	T-Stat	-0.146	0.631	-1.284	1.784	0.888	3.150			0.000
Russia	Coeff	0.003	-0.593	2.303	-0.768	-0.122	0.744	0.549	2.003	24.649
	T-Stat	0.260	-1.241	1.145	-0.883	-0.185	1.114			0.000
S. Africa	Coeff	-0.002	-0.304	-1.244	0.680	0.409	1.320	0.732	2.093	53.463
	T-Stat	-0.383	-1.807	-1.751	2.213	1.743	5.590			0.000
Taiwan	Coeff	0.000	-0.163	1.682	0.162	-0.220	-0.663	0.653	2.293	37.435
	T-Stat	-0.009	-0.780	1.915	0.426	-0.760	-2.271			0.000
Thailand	Coeff	-0.001	0.210	-0.545	1.553	0.142	0.054	0.539	2.343	23.705
	T-Stat	-0.049	0.565	-0.348	2.292	0.276	0.103			0.000
Turkey	Coeff	-0.001	0.824	3.165	-1.785	-0.947	0.660	0.456	2.302	17.248
	T-Stat	-0.067	1.645	1.502	-1.958	-1.365	0.944			0.000
Venezuela	Coeff	-0.007	-0.035	2.678	-1.117	-0.357	-0.356	0.204	2.217	5.971
	T-Stat	-0.525	-0.075	1.352	-1.304	-0.548	-0.542			0.000

Table 10: Five-Factor Model with Developed Markets, 1993-2005

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	U.S. (t-stat)	Japan (t-stat.)	U.K. (t-stat.)	Adj. R²	DW	F (p-value)
Argentina	Coeff	0.000	-0.160	1.037	-0.154	-0.011	0.008	0.340	2.050	15.933
	T-Stat	-0.044	-0.574	6.364	-0.644	-0.093	0.039			0.000
Brazil	Coeff	0.008	0.326	1.152	-0.677	-0.095	0.502	0.557	2.227	37.486
	T-Stat	1.075	1.307	7.873	-3.149	-0.864	2.571			0.000
Chile	Coeff	0.002	-0.066	0.833	-0.142	0.071	0.060	0.578	1.987	40.795
	T-Stat	0.493	-0.457	9.877	-1.146	1.119	0.533			0.000
China	Coeff	-0.010	-0.537	1.224	0.072	0.275	-0.338	0.399	2.076	20.288
	T-Stat	-1.305	-2.031	7.892	0.314	2.359	-1.632			0.000
Colombia	Coeff	0.005	-0.383	0.644	0.086	0.109	-0.167	0.111	1.790	4.627
	T-Stat	0.619	-1.418	4.067	0.372	0.921	-0.791			0.001
Czech Rep.	Coeff	0.012	-0.457	0.858	-0.528	-0.075	0.454	0.303	2.114	11.502
	T-Stat	1.759	-1.850	5.834	-2.452	-0.661	2.171			0.000
Egypt	Coeff	0.007	-0.105	0.347	0.523	-0.057	-0.560	0.187	2.024	3.724
	T-Stat	0.640	-0.384	2.047	2.401	-0.458	-2.554			0.004
Hungary	Coeff	0.020	0.108	0.927	-0.730	0.029	0.370	0.446	1.982	20.481
	T-Stat	2.697	0.401	5.762	-3.101	0.229	1.617			0.000
India	Coeff	0.001	-0.448	0.859	-0.024	-0.031	0.199	0.276	1.986	13.871
	T-Stat	0.275	-2.114	7.092	-0.128	-0.328	1.166			0.000
Indonesia	Coeff	-0.007	-0.184	1.278	0.057	-0.095	0.020	0.297	1.975	12.385
	T-Stat	-0.627	-0.482	5.643	0.176	-0.564	0.066			0.000
Israel	Coeff	-0.002	0.768	0.200	0.125	0.011	-0.338	0.313	2.049	14.213
	T-Stat	-0.333	3.894	1.732	0.737	0.127	-2.190			0.000
Jordan	Coeff	-0.002	0.761	0.205	0.119	0.025	-0.369	0.318	1.969	14.626
	T-Stat	-0.385	3.880	1.791	0.696	0.283	-2.370			0.000

Table 10: Five-Factor Model with Developed Markets, 1993-2005 Continued

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	U.S. (t-stat)	Japan (t-stat.)	U.K. (t-stat.)	Adj. R^2	DW	F (p-value)
S. Korea	Coeff	-0.001	0.432	0.794	0.368	0.137	-0.231	0.304	2.065	13.638
	T-Stat	-0.145	1.397	4.373	1.379	1.003	-0.952			0.000
Malaysia	Coeff	-0.004	-0.415	1.108	0.415	0.045	-0.445	0.406	2.010	20.832
	T-Stat	-0.580	-1.724	7.858	2.005	0.427	-2.364			0.000
Mexico	Coeff	0.001	0.072	1.067	-0.224	-0.120	0.230	0.585	1.897	41.824
	T-Stat	0.133	0.374	9.413	-1.347	-1.406	1.522			0.000
Pakistan	Coeff	0.003	-1.062	1.054	-0.490	0.103	0.265	0.175	2.245	7.159
	T-Stat	0.360	-3.271	5.537	-1.752	0.719	1.043			0.000
Philippines	Coeff	-0.008	-0.228	1.003	0.232	0.117	-0.162	0.367	1.920	17.828
	T-Stat	-1.150	-0.932	6.997	1.103	1.087	-0.848			0.000
Poland	Coeff	0.007	0.199	0.982	0.318	-0.105	-0.217	0.267	2.120	11.541
	T-Stat	0.734	0.555	4.683	1.032	-0.668	-0.775			0.000
Russia	Coeff	0.018	-0.500	2.090	-0.564	-0.076	0.631	0.441	1.913	20.087
	T-Stat	1.311	-1.014	7.126	-1.313	-0.334	1.513			0.000
S. Africa	Coeff	0.005	0.035	0.811	-0.025	0.110	-0.057	0.495	2.126	29.397
	T-Stat	0.969	0.203	7.938	-0.164	1.440	-0.417			0.000
Taiwan	Coeff	0.000	-0.132	0.976	-0.106	-0.012	0.036	0.413	2.126	21.370
	T-Stat	-0.036	-0.582	7.368	-0.545	-0.120	0.205			0.000
Thailand	Coeff	-0.007	-0.134	1.343	0.204	0.219	-0.086	0.440	2.110	23.794
	T-Stat	-0.836	-0.447	7.616	0.786	1.654	-0.367			0.000
Turkey	Coeff	0.001	0.762	1.015	0.401	-0.111	0.102	0.262	2.108	11.275
	T-Stat	0.088	1.668	3.787	1.019	-0.551	0.286			0.000
Venezuela	Coeff	-0.001	0.020	0.773	0.323	0.075	-0.497	0.166	2.002	5.693
	T-Stat	-0.140	0.051	3.434	0.901	0.421	-1.551			0.000

Table 11: Five-Factor Volatility Model with Developed Markets, 1993-2005

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	U.S. (t-stat.)	Japan (t-stat.)	U.K. (t-stat.)	Adj. R²	F (p-value)
Argentina	Coeff	1.78E-02	-0.229	1.385	-0.304	-2.31E-02	8.45E-03	0.474	25.162
	T-Stat	1.130	-0.572	5.957	6.254	-1.803	-0.089		0.000
Brazil	Coeff	-6.52E-02	2.081	0.689	0.433	0.113	0.718	0.650	50.845
	T-Stat	-4.251	5.353	4.054	2.013	0.689	2.849		0.000
Chile	Coeff	-5.49E-03	0.302	0.736	-8.59E-02	-0.223	0.758	0.801	109.147
	T-Stat	-1.082	2.350	13.084	-1.206	-4.118	9.085		0.000
China	Coeff	7.06E-02	-0.910	1.630	-1.237	-0.140	0.499	0.399	20.288
	T-Stat	6.465	-3.289	13.48	-8.073	-1.203	2.780		0.000
Colombia	Coeff	0.122	-1.001	1.000	0.110	-0.647	-0.445	0.551	33.904
	T-Stat	10.401	-3.373	7.716	0.671	-5.173	-2.313		0.000
Czech Rep.	Coeff	0.104	-1.061	1.100	-0.203	-0.130	-0.855	0.726	64.629
	T-Stat	10.998	-4.501	10.919	-1.647	-1.281	-4.805		0.000
Egypt	Coeff	0.153	-0.106	4.07E-02	-0.515	-0.501	-0.669	0.546	29.886
	T-Stat	14.517	-0.400	0.361	-3.744	-4.402	-3.356		0.000
Hungary	Coeff	2.94E-02	-0.188	0.841	-0.848	8.81E-02	1.246	0.403	19.064
	T-Stat	1.834	-0.469	4.914	-4.064	0.511	4.126		0.000
India	Coeff	0.127	-3.17E-02	3.90E-02	-0.571	-0.302	-8.46E-02	0.256	10.987
	T-Stat	16.170	-0.160	0.451	-5.197	-3.612	-0.658		0.000
Indonesia	Coeff	7.49E-02	0.550	1.882	-1.578	-0.183	-0.295	0.850	152.387
	T-Stat	5.254	1.523	11.932	-7.897	-1.205	-1.261		0.000
Israel	Coeff	4.43E-02	0.673	-6.71E-02	0.374	0.393	-0.724	0.348	15.273
	T-Stat	4.614	2.768	-0.631	2.778	3.836	-4.596		0.000
Jordan	Coeff	3.91E-02	0.170	-9.48E-02	-2.94E-02	-0.327	0.556	0.410	19.635
	T-Stat	9.942	1.712	-2.180	-0.534	-7.802	8.615		0.000

Table 11: Five-Factor Volatility Model with Developed Markets, 1993-2005 Continued

Markets		Constant (t-stat.)	World (t-stat.)	Emerging (t-stat.)	U.S. (t-stat.)	Japan (t-stat.)	U.K. (t-stat.)	Adj. R^2	F (p-value)
S. Korea	Coeff	6.41E-02	-0.182	1.729	-1.057	0.296	-0.897	0.743	78.560
	T-Stat	4.040	-0.453	9.843	-4.751	1.751	-3.443		0.000
Malaysia	Coeff	1.38E-02	0.258	1.384	-1.670	2.79E-02	0.819	0.837	138.560
	T-Stat	1.294	0.953	11.717	-11.156	0.245	4.675		0.000
Mexico	Coeff	5.41E-03	-0.526	1.152	-0.496	0.408	0.538	0.545	33.158
	T-Stat	0.384	-1.476	7.394	-2.511	2.715	2.325		0.000
Pakistan	Coeff	7.67E-02	1.015	0.766	-0.859	-0.813	0.783	0.725	71.805
	T-Stat	6.528	3.411	5.890	-5.213	-6.485	4.061		0.000
Philippines	Coeff	3.61E-02	0.328	0.983	-0.910	-0.231	0.755	0.821	124.019
	T-Stat	4.579	1.641	11.267	-8.226	-2.743	5.829		0.000
Poland	Coeff	-2.04E-02	1.182	0.373	-0.821	-9.66E-02	2.379	0.726	30.832
	T-Stat	-1.219	2.784	2.009	-3.494	-0.540	8.642		0.000
Russia	Coeff	0.112	-0.455	2.106	-3.061	-1.231	3.384	0.441	64.644
	T-Stat	3.904	-0.632	6.845	-8.153	-3.968	6.230		0.000
S. Africa	Coeff	2.85E-03	-0.266	1.251	0.331	-0.416	0.450	0.869	178.450
	T-Stat	0.458	-1.690	18.183	3.802	-6.272	4.408		0.000
Taiwan	Coeff	2.74E-02	1.245	5.29E-02	-0.369	9.01E-02	0.485	0.359	16.014
	T-Stat	2.639	4.740	0.461	-2.538	0.814	2.852		0.000
Thailand	Coeff	9.75E-02	-0.314	1.729	-1.602	-9.67E-02	-0.169	0.832	133.760
	T-Stat	7.842	-0.995	12.562	-9.185	-0.729	-0.826		0.000
Turkey	Coeff	8.55E-02	2.330	-9.72E-02	0.247	8.73E-02	-0.288	0.425	20.771
	T-Stat	4.801	5.164	-0.493	0.988	0.459	-0.984		0.000
Venezuela	Coeff	0.142	-1.099	0.791	2.75E-02	-1.398	2.005	0.244	9.662
	T-Stat	5.364	-1.639	2.700	0.074	-4.952	4.615		0.000

Graph 1: The World Returns Correlation between Russia, Thailand, and Turkey

Graph 2. Correlation Coefficients between Selected Emerging Markets Which had Experienced Financial Crisis

Graph 3: Comparison of Volatility Changes through Time, 1993-2005