

STOCK PERFORMANCE OF EMERGING MARKETS

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I. INTRODUCTION

EMERGING financial markets in the semi-industrialized countries have gained enormous attention from investors, researchers, and policymakers in the last ten to fifteen years because of several factors. Perhaps the foremost factor is their strong performance over this period with yields in some markets far exceeding those of the industrial financial markets. This performance has been accompanied, however, by high volatility involving significant risks for both the international investors as well as the real economic development of the countries concerned.

How do emerging markets (EM) develop, and how differently do they behave from the more mature industrial markets (IM)? What are the features and the underlying factors behind the financial volatility in the EM, and how significant are the repercussions of these ups and downs movements and their chain reactions on the further evolution of the real sides of these economies? What are the borders in this respect between market and state failures, and what are the implications for policy coordination at the national and international levels? These are questions, which are regularly asked whenever a major financial crisis starts in one EM and spreads to other EM. The purpose of this paper is to systematize empirical evidence on the performances and tendencies in the EM, and develop approaches which highlight intraregional and interregional linkages and dependencies that we think are vital for understanding and guiding the integration process of the EM with the IM in the world economy.

Before dealing with any statistics the next section will briefly review the data used, and their division and analysis into two distinct periods: 1984–93 and 1994–98. In Section III we treat the performance of EM for period 1984–93, in terms of four stylized facts. First, EM offered yields far in excess of those in IM. Second, volatility of stock returns in EM was much higher than in IM. Third, the characteristic return-risk trade-off of the EM undermined the prospects of EM as quality

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markets. Fourth, the EM stock returns showed high autocorrelations implying a strong predictable component in the stock returns and the presence of market inefficiencies. These four stylized facts have led to a couple of policy prescriptions on the desirability of a further liberalization of the functioning of EM, and their integration into the world economy. In Section IV attention is directed to period 1994–98 which has shown negative returns and excessive volatility which could bring irreparable damage to the economic fundamentals of weaker EM. In Section V a cross-regional description and interpretation of tendencies is given. In Section VI a relative measure of regional performance is proposed and applied. In Section VII some data on the EM of Eastern Europe are presented and analyzed in the light of what has been found for their East Asian and Latin American forerunners.

II. DATA USED

All data on stock returns reported in this paper come from two different sources. Data on twenty EM come from the International Finance Corporation (IFC) Indices; data on twenty IM are taken from the Morgan Stanley Capital International (MSCI) Indices. Note that Hong Kong and Singapore are conventionally included in the MSCI Indices, and are considered to be IM. In a later part of the paper a regional approach is followed in which these two countries are included in the East Asian region, which is basically an emerging market.

Stocks of each country are selected for inclusion on the basis of liquidity (how often they trade and the volume of trading) and size (market value). For more detailed information on the number of stocks included in the market indices and the industrial composition for the EM, see Claessens (1995) and IFC (1995).

The returns of each market are weighted averages of the returns of the selected stocks that trade in that market, the weights being the share of each stock in the total market capitalization. The returns include both the announced dividends and the capital gains, and are measured in U.S. dollars. As such, returns expressed in U.S. dollars are comprehensive as they allow appraising investment in comparative markets, and incorporate different kinds of uncertainty; for example, not only the volatility of equity market returns but also the volatility of exchange rates. In fact, the latter is a very significant element in total volatility. Because all indices are measured in U.S. dollars, they form a good measure of the total returns that an international investor would realize from an investment in an emerging or industrial market; moreover, analytical comparisons can now be done with due consideration to exchange rate changes.

The return indices are expressed in percentages and are monthly. The monthly returns are processed to give annual returns as an arithmetic mean and as a geometric mean. The Appendix Tables I and II present the arithmetic mean and the geometric mean for the two samples, along with other features which will be discussed.

TABLE I

STATISTICS ON ANNUAL STOCK RETURNS: AVERAGES FOR TWENTY EMERGING AND TWENTY INDUSTRIAL FINANCIAL MARKETS FOR THE PERIOD JANUARY 1984–DECEMBER 1993

Markets	Arithmetic	Geometric	Standard	Sharpe	Number of	Autocorrelation		
	Mean	Mean	Deviation	Ratio		r_1	r_2	r_3
	(%)	(%)	(%)					
	x	y	s	p				
Emerging markets	27.68	17.47	12.21	0.370	80	0.164	0.113	0.079
Industrial markets	16.55	13.45	6.93	0.537	42	0.071	0.039	0.059

Source: Appendix Tables I and III. The average of a statistic for EM or IM is defined simply as the sum of the country values divided by the number of countries, except for autocorrelation averages which are calculated ignoring the correlation sign.

TABLE II

STATISTICS ON ANNUAL STOCK RETURNS: AVERAGES FOR TWENTY EMERGING AND TWENTY INDUSTRIAL FINANCIAL MARKETS FOR THE PERIOD JANUARY 1994–DECEMBER 1998

Markets	Arithmetic	Geometric	Standard	Sharpe	Number of	Autocorrelation		
	Mean	Mean	Deviation	Ratio		r_1	r_2	r_3
	(%)	(%)	(%)					
	x	y	s	p				
Emerging markets	1.03	-5.73	9.07	-0.032	24	0.131	0.130	0.128
Industrial markets	9.73	8.18	4.59	0.541	5	0.199	0.105	0.084

Source: Appendix Tables II and III. The average of a statistic for EM or IM is defined simply as the sum of the country values divided by the number of countries, except for autocorrelation averages which are calculated ignoring the correlation sign.

This information is summarized in the form of simple averages for both the EM and IM in Tables I and II.

As stated in the beginning, for a better insight into the different performances of EM and IM and the underlying factors, it is crucial to make a distinction between two periods, a first period of initiation and nurturing of EM which can be set from January 1984 to December 1993 (for a few EM countries there are monthly indices from January 1976, but for most EM data is available only from January 1984), and a second period which started from January 1994 and is still ongoing (with the latest indices recorded as of December 1998). The first period is ten years long and the second is five years long. Any dividing line in time series analysis contains arbitrariness, and the dividing line of December 1983 / January 1984 is no exception. However, this is the most logically and empirically motivated threshold since it is around this period that the EM started enjoying very significant surges in international capital inflow in the form of portfolio investment. This upsurge was partly

a response to the liberalized economic policies by EM. The capital flows bolstered the economic growth of the EM but, as will be seen, the performance of EM became much more volatile in later years to the extent that the achieved economic growth has become endangered. The last five years especially featured the so-called Tequila crisis of December 1994 which started in Mexico and led to sudden falls in IFC Latin American Indices of more than 20 per cent, and the Asian breakdown of stock returns and exchange rates which started on August 1997 in Thailand and spread to the whole Southeast Asian region, Russia, and Brazil, with some falls in the IFC indices of more than 60 per cent. The dividing line emphasizes also the beginning of a period of high sustained growth of the U.S. economy and bullish industrial financial markets which undoubtedly reduced the attractiveness of portfolio investment in the EM.

III. STYLIZED FACTS: THE EARLY YEARS

In this section we consider the four stylized facts stated earlier and elaborate on two policy standpoints which are associated with them.

First, as can be seen from Table I, the annual returns expressed as an arithmetic mean for each country and calculated as an average of all EM, (x) was 27.7 per cent, which was higher than for IM at 16.6 per cent. Appendix Table I shows that for individual EM countries the arithmetic mean ranged between 67 per cent for Argentina and 10 per cent for Indonesia, with Jordan and Nigeria as extremes at 4 and -5 per cent respectively. This wide range contrasts sharply with the narrow range for IM. In the EM, eleven countries had returns higher than 25 per cent. In the IM only Hong Kong had a return exceeding 25 per cent.

Second, the higher returns of EM were characterized by higher volatility which sometimes was very extreme. The high volatility is obvious from comparing the arithmetic mean with the geometric mean. The arithmetic mean, x , is the return on a strategy that requires equal investment in each period, that is, gains made when the investments are not reinvested in the market. The geometric mean, y , which takes the difference in the natural logarithm of the returns, represents a buy-and-hold strategy in which a fixed amount is invested at the beginning of the first year (1984), and the portfolio is held until the end of the last year (1993). Hence, large differences between the arithmetic and geometric means stand for high volatility. Large differences are especially observed among EM, where the arithmetic average of 27.7 per cent for the EM as a whole is reduced by about ten percentage points to give a geometric average of 17.5 per cent. For the IM the reduction is only three percentage points, bringing the returns from 16.6 per cent to 13.5 per cent. Notwithstanding this adjustment, the returns in EM are still higher than in IM by about four percentage points.

Third, a very important statistic that indicates volatility and risk to the investor is

the standard deviation, s , as it can give a rough estimate of the erratic behavior of stock returns, especially when looking at the consistency of return patterns. The standard deviation, calculated on a monthly basis ranges from 30 per cent for Argentina to 5 per cent for Jordan, and gives an average for all EM of 12 per cent. In contrast, the average standard deviation in IM is about 7 per cent.

What are the implications of adjusting the high stock returns to relatively still higher standard deviations in EM for a risk-neutral investment strategy? Special attention needs to be given to the impact of volatility, as it plays a crucial role in risk analysis. Volatility, which increases the unpredictability of returns to investors, is an important but poorly understood factor in emerging equity markets. A market with lower volatility is, other things equal, more investor-friendly and will attract larger and stable amounts of capital. In addition, the cost of raising capital will be lower. As real investment decisions in an economy are related to both the mean of expected returns as well as the uncertainty of those expected returns, e.g., the standard deviation, it is essential to adjust the mean returns to the standard deviation to obtain a more meaningful picture. The Appendix Table I calculate such an adjustment. The Sharpe ratio, $p = \sqrt{y}/s^2$, indicates the relative return-risk trade-off in the individual country markets. The Sharpe ratios for most EM are now found to be below those for the IM. Table I computes a simple average of p for all EM at 0.37 and for all IM at 0.54. These averages indicate that the EM have a lower return-risk trade-off than the IM, and this may lead to an investment climate which discourages high-quality capital flows, and make the EM more vulnerable to speculative portfolio investments. As usual, there are individual exceptions to the generally obtained results in both country groups, but these do not significantly affect the conclusion that the EM are qualitatively inferior markets when compared to the IM. In particular, there are five EM which exceed the average of IM; these are Chile, Colombia, Pakistan, the Philippines, and Thailand. On the other hand, two IM have p falling below the average of the EM; these are Australia and New Zealand.

One other statistic that indicates volatility is the comparative number of outliers in both samples. Volatility is manifested in strong and most of the time unanticipated shocks in stock return patterns which do not fit with the expected degree of volatility in the investor's mind. Barnett and Lewis (1979) define an outlier in a set of data as an observation or subset of observations, which appear to be inconsistent with the remainder of the set of data. The detection of outliers starts with presuming a normal distribution for all data samples. An outlier is defined here as an observation which finds itself outside 98.4 per cent of the area under the standard normal curve. The Appendix Table III sums up all outliers by individual country for the EM and IM. The total numbers of outliers for the two country groups are shown in Table I, totaling eighty for the EM and forty-two for the IM. This implies an average of four outliers per country among the EM; the highest number of outliers occurring in Brazil (nine), Greece (eight), Argentina, India, and Jordan (six each).

The contrast with the IM is striking, the average being two outliers per industrial market, with only Belgium and Germany showing four outliers.

Logically, one would expect a data sample with a high standard deviation to show fewer outliers than a data sample with a low standard deviation, as outliers are selected on whether they belong to 98.75 per cent of the area under the standard normal curve. Although presumably logical, the obtained performances present a converging aggregate picture. Most EM score the highest standard deviations and the highest number of outliers. This converging tendency is the result of the loose relationships between the standard deviations and the numbers and sizes of outliers in the context of country samples which manifest a wide variety of volatility that show themselves sometimes in higher or lower standard deviations and at other times in more or less outliers with very significantly changing magnitudes.

Fourth, high autocorrelations in EM indicate the presence of various imperfections in the functioning of these markets. The Appendix Table I reports first-order autocorrelations, r , for periods of one, two, and three months. Here high correlation suggests that returns contain a predictable component, which in the light of efficient-market models would imply inefficiency in the market. Low to zero correlation on the other hand would imply a random walk, consistent with the efficient market hypothesis.

Comparing the autocorrelations of both the IFC and MSCI samples reveals some clear evidence on return behavior. Among IM, five countries exhibit the highest one-month correlation, exceeding 10 per cent in either positive or negative direction. In contrast, twelve EM exhibit one month correlations higher than 10 per cent, eight of them exceed 20 per cent, and two of these exceed 30 per cent. The EM show a continuation of autocorrelation at the two and three months intervals but at a reduced rate. Within the MSCI sample, the United States seems to be the closest to a random walk, while Finland by this measure, seems to be the worst performer in terms of market efficiency. Within the IFC sample, the Republic of Korea's stock return pattern is the closest to a random walk, while the strongest rejection of the efficient market model comes from Colombia.

The aggregate picture for the two samples is depicted in Table I, based on calculating averages of r for each sample while ignoring the sign of r . The table shows the average autocorrelations for EM at a high rate of 16 per cent and falling to 11 per cent and 8 per cent when longer periods are considered; the corresponding figures for IM are 7 per cent, 4 per cent, and 6 per cent. The conclusion is that EM contains stronger predictable components in their stock returns than in the case of IM. According to efficient market models this implies that EM are less efficient, presuming, of course, risk-neutral investors. The inefficiencies could stem from market imperfections, such as infrequent trading of the component securities, or by some fundamental forces, such as predictable changes in sensitiveness to world risk.

Market imperfections, as well as volatility in EM, are often said to be caused by small-market effects and informational imperfections. Information about stock value, and therefore stock prices, tends to be noisy when few trades are occurring. Especially the limitation in reporting requirements in many EM make investors less informed about firms and less-frequently updated on financial issues and trends. Investors in IM enjoy more accurate information networks in which information is faster, more fluent, and available to a wider and deeper extent. Buckberg (1995) adds to this that in a small securities-market, trades that are small by New York standards may adversely affect prices; the limited size of certain transaction may withhold investors from fully exploiting all available information, and may explain why the return in EM contain large predictable elements.

How can the high volatility in EM, which is manifested in the previously stated stylized facts, be reconciled with the high predictability, which is implied by the autocorrelations? While one-month autocorrelations in EM amounted on the average to about 16 per cent, these fall to 11 per cent in the case of two months and then to 8 per cent in case of three months. The results emphasize that depending on the timing, the longer the period considered the less predictable are the EM suggesting that periodical predictability and periodical volatility reinforce each other. The random walk in EM looks to be applicable for longer stretches of time, suggesting that it takes a longer time to adjust to newly acquired information and occurring events. The IM adjust more quickly and thus show lower autocorrelations.

The four stylized facts stated above are often combined to defend a couple of free market policy standpoints. First, it is argued that EM are handicapped by market imperfections and state interventions which increase their volatility and damage their profitability; a further liberalization of these markets would foster their integration into the world economy, reduce their volatility, enhance portfolio investment and secure more stable profitability prospects. This policy standpoint is seen by some economists to have suffered a setback, however, as they maintained that on the eve of the recent ASEAN financial crisis it was exactly those EM which have pursued more liberal and integrative policies that suffered most while other ASEAN countries which were much more closed suffered least. The issue remains controversial as other economists argue that the liberalization took place too late and too little in the ASEAN economies to have any crucial effects on stability.

Second, the advocates of free market policy further elaborate their standpoint by pointing out that the EM offer a welcome opportunity for international investors to diversify their portfolio at a time when American and European stocks are moving closer to each other. Private international capital, it is argued, would continue pouring into EM as long as the economic fundamentals in these countries are healthy. This policy standpoint supports a dominant role for private international capital flows in maintaining worldwide financial stability and minimizes the need of EM for intergovernmental negotiated international assistance packages in combating

undesirable consequences of volatility. This standpoint has also lost much ground as it is being increasingly realized that without the IMF and bilateral assistance packages, the prospects for recovery in many adversely hit EM will be very dim.

IV. STYLIZED FACTS: THE LATTER YEARS

Economic insight is heavily dependent on historical developments. Economic knowledge on EM has undergone significant changes in the last five years as these markets grew and developed in irregular ways. The markets were subjected to two heavy financial crises, the first starting in Mexico in December 1994 and spreading to other Latin American EM, and a more severe financial crisis starting in Thailand in August 1997 and spreading to the other Southeast Asian countries, Russia, and Brazil; it should be noted, though, that the causes for the crises in each of these three areas were different. The facts have changed appreciably as a result of these crises and are compelling adjustments in economic insight.

Table II summarizes the main tendencies of the period from January 1994 to December 1998; the Appendix Table II gives country details. First, the annual returns on an arithmetic mean basis have amounted to only 1 per cent for the EM, compared to about 10 per cent for the IM. Emerging markets and industrial markets have now reversed positions with respect to yields. Second, the volatility among the EM intensified further during the latter period and has undermined the returns further, resulting in negative returns as shown by the geometric mean. On average, an investor would have lost cumulatively about 6 per cent annually during the past five years if the investor had held EM stocks, compared to a gain of about 8 per cent annually if IM stocks were held. This is a remarkable reversal of yields over a period of five years. Third, more insight into volatility and its effects is gained by examining the standard deviations of the two markets. The EM registered on average a standard deviation twice as high as that of the IM. The gap between EM and IM with respect to the return-risk trade-off as expressed by the Sharpe ratio has widened remarkably to the disadvantage of the EM. The volatility is also reflected in the number of outliers, which is almost five times as much among EM than IM during the last five years, i.e., 24/5. The relationship was only twice as much in the earlier period, 80/42. Fourth, autocorrelations were on average higher in the past five years as compared to the previous five years, which may indicate either (a) a departure from the random walk hypothesis and a rise in market imperfections, or (b) a genuine reflection of the underlying economic fundamentals which are presumably mostly gloomy for the EM and bright for the IM, or (c) a combination of (a) and (b).

The conclusion is that the stylized facts of 1984–93, which show attractive performances of stock returns among the EM, stand in sharp contrast with the stylized facts of the latter five years. These show depressed EM brought on by two major

financial crises. The first financial downturn which started in Mexico and spread thinly to other neighboring countries was accompanied by currency devaluations, dips in real growth, significant capital injections from the IMF to regain confidence, and took more than half a year before recovery was realized. The second financial crisis started in Thailand, triggered by lower company profit forecasts and enterprise debt default, and spread in a very short time to all ASEAN countries, resulting in heavy falls in stock prices and currency rates, and reducing market capitalization in some instances to half what they had been. The ASEAN crisis was followed by a Russian crisis, mainly due to government debt default and later by a Brazilian crisis mainly due to currency overvaluation. Most of the affected countries experienced zero or negative real growth immediately thereafter. External bilateral and international financial assistance has been playing a crucial role in organizing their recovery, which was not yet in full stride by the end of 1998.

There were several causes behind the financial crises but there is yet no quantification of the significance of each cause. There is a class of opinion which blames the national governments for overdoing cutthroat competition, production overcapacity, soft lending, currency protection, rent seeking, and weakness in institutions and governance at both the corporate and state levels. There is the opposite class of opinion which lays the blame on the failure of international financial markets and external investors to be Pareto-efficient, this due partly to a skewed distribution of market power, information and access to the advantage of footless international investors and speculators and to the disadvantage of the concerned economies, and partly due to the persistence of investors' herd behavior which results in bubbles followed by volatile downward corrections. There is also a class of opinion which emphasizes structural changes in economic fundamentals. Higher and prolonged economic growth associated with productivity shifts and sunrise industries in the IM, especially the United States, have created higher yield prospects than in the EM which tend to focus more on relatively low value-added sun-down industries. Sooner or later a shift of investment funds from EM to IM had to take place, and this was reflected in a reversal of stock performance between EM and IM. Other causes put forward which might have aggravated the decline and slowed economies were the delayed and inconsistent reactions by the concerned governments and international agencies.

Each of the above class of causes has its own implications for policy standpoints, but in the lack of a quantification of the relative significance of alternative causes, the controversy on the right policy continues. For instance, it is exactly those countries which liberalized their financial markets that were hit most, and this may suggest that the behavior of external investors was more dominant than the behavior of national cultures in causing the crises. In the same vein it can be argued that the buildup of financial institutions by the national authorities did not go far enough to match the risks involved in opening up national financial markets worldwide.

V. A REGIONAL APPROACH TOWARDS EMERGING MARKETS

Because of their economic linkages in trade and investment, countries belonging to the same region often share common tendencies in their growth prospects and stock returns. The application of regional groupings to both the EM and IM can produce more systematic and meaningful aggregate results. This section will report on such regional results. Two problems require resolving if a regional approach is to be applied. First, which countries in which regions? Hong Kong and Singapore share more traits with the East Asian region which is primarily EM, than with the IM which are mainly Euro-American, as can be observed from the returns statistics in the Appendix Tables I and II, although the two markets may fully satisfy qualification conditions of IM. Given the purpose of this analysis, both markets are assigned to the East Asian EM region (EA). The Latin American EM region (LA) is straightforward and requires no further comment. There is also reason to consolidate qualifying Eastern European EM (EE) as a third EM group. We will deal with this aspect in a later section. There are a few other dispersed EM which do not readily belong to a regional grouping and which are not included in this analysis. To increase the focus of analysis, the IM regions can readily be limited to three: the United States, EU, and Japan. This gives in total three EM and three IM regions whereby dependency relationships can be hypothesized between a particular IM and the EM region which is most closely related to it in terms of trade and investment. For instance, the United States and the LA form such a couple. Similarly, the EU and the EE, and most evidently, there are the heavy linkages between Japan and the EA.

Second, the return statistics for a particular region should in principle be weighted on the basis of the market capitalization of the individual countries in the region. There are available market capitalization indices for the LA; but those for the EA do not fit into our classification, and figures for the EE are not yet available. To avoid the bias of using market capitalization weighted statistics for some regions and unweighted averages for others, we shall make use of unweighted averages overall. A better way of resolving the problem would be to construct capitalization weighted regional market returns statistics from the fifty stocks with highest market capitalization in each region, i.e., top fifty, and ignore the country markets altogether. This would require more computational work but would be more systematic and consistent with investment decisions and strategies which established international fund managers follow.

Tables III and IV summarize results for the regional groupings proposed. It is immediately seen from Table III that during the 1984–93 period, LA scored higher returns than EA but was also more volatile, resulting in a return-risk trade-off as approximated by the Sharpe ratio which is lower for LA than for EA. The autocorrelations are found to be generally higher for LA implying more market

TABLE III

STATISTICS ON ANNUAL STOCK RETURNS: AVERAGES FOR EMERGING AND INDUSTRIAL REGIONAL MARKETS
FOR THE PERIOD JANUARY 1984–DECEMBER 1993

Markets	Arithmetic Mean (%) x	Geometric Mean (%) y	Standard Deviation (%) s	Sharpe Ratio p	Autocorrelation in Months r_1
Emerging:					
Latin America (LA)	28.43	21.54	10.55	0.44	0.235
East Asia (EA)	20.38	16.94	7.37	0.55	0.035
East Europe (EE)	...	...	...	...	...
Industrial:					
United States	11.97	10.71	4.45	0.72	-0.015
Japan	19.40	15.47	8.05	0.50	0.042
European Union	17.55	14.63	6.86	0.56	0.089

Source: Japan and the United States are from the Appendix Tables. For the other financial regional markets, the monthly country yields available from the IFC and MSCI were aggregated on the basis of simple averages to give the monthly regional yields. The resulting series were then used to calculate the various statistics on annual stock returns. LA includes Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. EA includes Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand. EU is defined to include EU members as well as Norway and Switzerland.

TABLE IV

STATISTICS ON ANNUAL STOCK RETURNS: AVERAGES FOR EMERGING AND INDUSTRIAL REGIONAL MARKETS
FOR THE PERIOD JANUARY 1994–DECEMBER 1998

Markets	Arithmetic Mean (%) x	Geometric Mean (%) y	Standard Deviation (%) s	Sharpe Ratio p	Autocorrelation in Months r_1
Emerging:					
Latin America (LA)	7.45	3.88	7.63	0.25	0.172
East Asia (EA)	-15.74	-17.74	5.47	-0.74	0.240
Eastern Europe (EE)	...	...	...	...	...
Industrial:					
United States	19.22	18.42	3.31	1.31	-0.199
Japan	-6.38	-8.16	5.40	-0.53	0.009
European Union	14.05	12.60	4.64	0.77	-0.242

Source: See note for Table III.

imperfections in LA than in EA. Table IV, which reflects the 1994–98 period, shows a reversal of results to the advantage of LA and the disadvantage of EA; this is partly due to a reversal of the existing conditions of excessive volatility and market imperfections. There are other reasons, however, which can be sought in the higher returns which the United States was able to score in the latter period, and these

reflected a trend of continued economic growth that had external positive effects on the economies and financial markets of Latin America. In contrast, the weak economic and financial market performance of Japan during the latter period correlates with the observed weaknesses of the East Asian economies and emerging financial markets; the two regions are economically and financially significantly linked to each other. Finally, it is interesting to note the intermediate position which the EU occupies between the United States on the one hand, which has been the least volatile and most competitively responding market, and on the other hand Japan and the various EM which have shown the least competitive market responses, and in the case of the latter have manifested the highest volatility.

VI. CROSS-REGIONAL RELATIVE PERFORMANCES

Relative market performance rates (RMPR) can be calculated for the month-by-month yield of a specific region in terms of that of the United States, this can be defined as $[(\text{index } x_j \text{ of the monthly stock returns of region } j) / (\text{index } x_u \text{ of the monthly stock returns of the United States})] \times 100$. This rate shows the comparative advantage in a specific month of the individual markets vis-à-vis the United States. There is a tendency for stocks to be sold and flow out from a region j which scores a low returns index in a specific month; this capital then flows to a region j' with a higher returns index. The U.S. stock market is the most attractive in month(s) when the return indices for all regions are below those of the United States. These will give RMPR below 100 per cent when viewed from the U.S. perspective. It should be noted that the indices of the monthly stock returns are not cumulative but are calculated on a month-by-month basis, implying that investors make reallocation decisions between regions on a monthly basis, which may very well be the most common practice. The choice of the United States as the denominator is motivated by the fact that the biggest part of world market capitalization is in the United States and is very much tied to the United States.

Relative market performance rates is helpful in tracing alternative regional performances from the perspective of an international investor who looks for the highest returns among competing markets. As can be expected, the RMPR for the EM will show many fluctuations above and below the 100 points level, contrary to the RMPR of IM which will tend to take values close to 100 per cent. There are two main reasons for this. First, the EM of LA and EA have very different sectoral structures and other characteristics compared to the United States, which show themselves in great divergences in RMPR for the EM. On the other hand, the IM of Europe and Japan have economic structures close to that of the United States, which cause performance to converge, although this applies more to Europe than Japan. Second, the market capitalization in the EM is relatively very small when compared to the United States, EU, or Japan. Figures for January 1994 give market

values for LA at U.S.\$49 billion and for EA at U.S.\$118 billion, compared to U.S.\$2,353 billion, U.S.\$2,332 billion, and U.S.\$4,023 billion for the EU, Japan, and the United States, respectively. Given these comparative sizes, the flow of portfolio investment in or out of the EM of LA and EA is bound to result in greater movements in the stock returns of the EM than in the case of the IM. Furthermore, the part of the market capitalization in EM which can be considered to be nationally tied to the EM is much lower than in the case of the IM. National investors in an industrial market tend to withhold a greater share of their portfolio investment within the national boundaries, which is logical given the much greater investment alternatives available in an IM as compared to an EM. The RMPR for LA and EA are, therefore, very sensitive to foreign portfolio investment.¹

The graphic presentations in Figures 1, 2, 3, and 4 reflect the above features. The RMPR from around 1986 and onwards show frequent changes for EA and LA. The frequent fluctuations in RMPR make the EM especially attractive to international investors who constantly look for possibilities of diversifying their investment portfolio. The decision to diversify regionally is often accompanied by significant flows of funds between the regions and changes in exchange rates. The EM are also attractive because the RMPR for EA and LA are also more often above than below 100 per cent, which means a higher recurrence of higher monthly stock returns in EA and LA than in other regions. In contrast, the returns for the IM in this period remain close to each other, give RMPR which are flat, and hence featuring least differences in yield and volatility.

As can be seen in Figures 1 and 2, for a couple of months in the first half of 1993, EA and LA diverged greatly from each other, with RMPR for EA falling to around 100 points and RMPR for LA surging to around 210 points. These performances were accompanied by a temporary shift in the distribution of foreign-owned portfolio investment between the two regions. Such a shift is temporary as the RMPRs will tend to readjust within a few months to their previous positions and resettle for some time at the 100 points level before they start fluctuating again in response to changes in expectations.

Figures 3 and 4, for the EU and Japan, relate to a longer period starting from January 1976, a time when the EM were absent. It can be seen that both regions have had significant surges in their RMPR, reaching around 340 per cent in early 1977, and suffering a fall in early 1985 to around 60 per cent. Since then the RMPR for the EU and Japan has stayed close to the 100 points level. This could suggest that the EM may have taken over from the IM the role of the buffer zone which absorbs the relatively defined shocks in stock returns.

¹ The RMPR can be developed further to incorporate the relative performance with regard to the

standard deviation, for instance, $\left[\frac{x_j}{x_u} \cdot \frac{s_u}{s_j} \right] * 100$

Fig. 1. RMPR for LA/U.S.

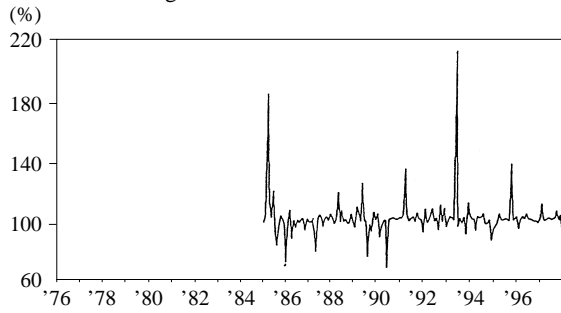


Fig. 2. RMPR for EA/U.S.

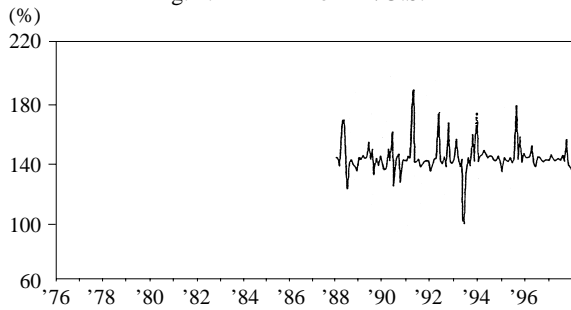


Fig. 3. RMPR for EU/U.S.

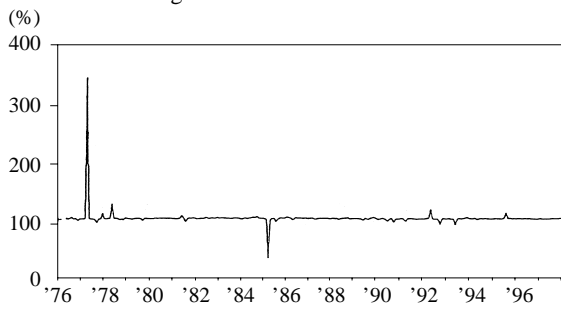
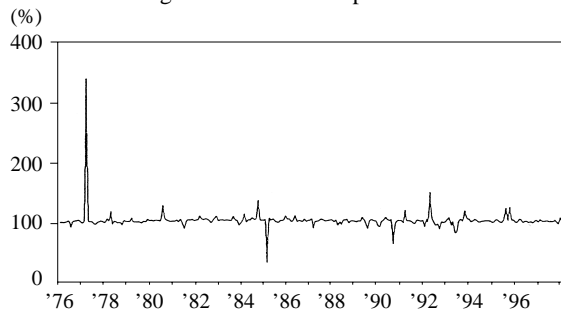


Fig. 4. RMPR for Japan/U.S.



This shift in performance patterns and risk assignment over the past fifteen years in regional portfolio investment needs to be interpreted in the light of the diversification advantages which international investors have in the context of the high-risk EM as compared to the more converging performances of the IM. The long-run diversification potential in emerging stock markets has been recognized and studied by, among others, DeFusco, Geppert, and Tsetsekos (1996) and Chan, Gup, and Pan (1992). They show correlations among EM and between EM and IM to be low on average and occasionally negative. This contrasts with generally higher correlations between the United States and EU, and to a lesser extent with Japan, though cointegration tests for IM do not establish as yet that these IM are fully integrated and interdependent. We include an Appendix Table IV which gives correlation coefficients of the monthly stock returns among the identified regions over the whole sample period January 1984 to December 1998. The correlation results, which are generally lower for EM than for IM, suggest indeed that diversification advantages have been enhanced with the establishment of the EM next to the IM. As was previously stated, this positive development has a cost price in the form of a highly uncontrollable imported instability into an otherwise just starting and very fragile financial market.

It is sometimes suggested that as the EM introduce more liberalization and become more integrated in world finance, their market performance will tend to converge with those of the IM, and therefore, reduce the diversification advantage. Although this is logical at a highly aggregated level, the diversities at lower levels of aggregation relating to individual countries, sectors, and firms is immense, and support expectations of a continuing high degree of independent performances. This is further strengthened when one considers the emergence of new sector- and new country-markets and the unpredictability of technological change and its incidence among existing sectors, new sectors, and countries.

VII. SOME RESULTS FOR EASTERN EUROPEAN TRANSITION ECONOMIES

Among the newcomers in the EM are four Eastern European transition economies. Statistics on stock returns from IFC sources are now available for the Czech Republic, Hungary, and Poland from January 1994 onwards, and for Russia from February 1997 onwards. The market value of the listed and selected companies by the IFC for these markets is very tiny in relative terms. For example, Hungary had in January 1994 a total market value of about U.S.\$0.10 billion covering twenty-eight companies; the figures for Poland were U.S.\$2.17 billion covering twenty-two companies. The small size of these markets, along with political uncertainties and macro instability, resulted in very volatile performances of these markets as can be gathered from the statistics in Table V. Care is needed in interpreting the statistics on the

TABLE V
ANNUALIZED STOCK RETURNS AND OTHER FEATURES FOR EASTERN EUROPEAN TRANSITION ECONOMIES
BASED ON MONTHLY STATISTICS, JANUARY 1994–DECEMBER 1998

Markets	Arithmetic	Geometric	Standard	Sharpe	Autocorrelation		
	Mean (%) <i>x</i>	Mean (%) <i>y</i>	Deviation (%) <i>s</i>	Ratio <i>p</i>	<i>r</i> ₁	<i>r</i> ₂	<i>r</i> ₃
Emerging:							
Czech Republic	-10.89	-16.01	9.55	-0.44	0.305	-0.149	-0.309
Hungary	23.34	15.02	12.34	0.34	-0.105	-0.003	-0.028
Poland	4.66	-7.99	14.66	-0.19	-0.089	-0.093	-0.104
Russia	77.19	65.64	12.79	0.65	-0.047	-0.181	-0.053

Source: IFC, MSCI, and the author's own calculations.

Note: Periods: January 1994–December 1998 for Czech Republic, Hungary, and Poland; and February 1997–December 1998 for Russia.

annual stock returns given the frequency of outliers, the short period considered and the arbitrary character of the starting and ending dates of the series in Table V.

Hungary appears to hold much of its returns after correction for risk, is moderately volatile, and is most representative of the random walk model. The Czech Republic shows the opposite. The economic fundamentals, which are much more sound in Poland than in Russia, are not reflected in their relative performances as shown in the table, which shows higher returns for Russia than Poland. This may be due to the fact that the listed companies in the Russian market are highly segmented and are not reflective of the Russian economy.

What kind of interdependencies in performance do the EE show in relation to other regions? The correlation matrix in Appendix Table IV shows higher correlations for the EE with other EM than with the IM. EE (i.e., Russia) is highly correlated with LA, with a correlation coefficient reaching as high as 0.63; the correlation coefficient with EA is as high as 0.41. This association is not reflective of economic interdependencies in the real sphere, which are hardly significant. The correlations reflect significant links between the EM regarding financial market sentiment and limits on the lending capacity of international investors and lending institutions. A crash in an EM denoted by *j* may bring losses for the less alerted international investors in *j*. To remain solvable within the customary norms, they may be forced to withdraw from another EM denoted by *j'*, causing another crash in *j'*, the whole being intensified by herd behavior, and leading to the observed interdependencies between the EE and other EM.

Appendix Table IV also shows correlation coefficients between the individual EE. These are also very high, scoring between 0.53 and 0.62, with the exception of Poland/Russia having a correlation coefficient of 0.26. This may again reflect the influence of the portfolio behavior of international investors on the contrasting per-

formances of these two markets. The two markets are often conceived as two opposite poles in an investment strategy.

VIII. CONCLUDING REMARKS

The general view has been that stock returns in the EM are on the average higher than in the IM and that this performance occurs in the context of an inefficient market setting in the EM as manifested in their high volatility, autocorrelations, nontransparency, and lack of effective governance. This study subjected the general view to several qualifications since performances and their interpretation depend very much on the selected periods and regions, as well as the role assigned to international investors in activating these markets.

To gain more insight on the evolution of EM in relation to IM and reflecting on the appropriate international policies to cope with thresholds in this evolution, there is a need for employing a broader framework of analysis than is usually done. This paper has initiated some thoughts and applications in this regard. A broader framework of analysis should incorporate the measurement of indices of relative regional performance, and analyze interactions among regional EM, as well as in relation to the IM. It will be essential to distinguish between fundamental economic interactions in the real sphere and financial interactions resulting from market sentiment and the regional strategies of international investors, lending banks, and international agencies.

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APPENDIX TABLE I
ANNUALIZED STOCK RETURNS AND OTHER FEATURES OF EMERGING AND INDUSTRIAL
MARKETS BASED ON MONTHLY STATISTICS, JANUARY 1984–DECEMBER 1993

Markets	Arithmetic	Geometric	Standard	Sharpe	Autocorrelation		
	Mean (%) <i>x</i>	Mean (%) <i>y</i>	Deviation (%) <i>s</i>	Ratio <i>p</i>	<i>r</i> ₁	<i>r</i> ₂	<i>r</i> ₃
Emerging:							
Argentina	67.28	25.58	30.12	0.20	-0.018	0.008	0.138
Brazil	34.11	10.04	20.12	0.16	0.011	-0.004	-0.060
Chile	32.40	28.13	8.18	0.66	0.312	0.004	-0.126
Colombia	34.71	29.88	9.10	0.65	0.480	0.167	0.011
Greece	17.97	9.39	12.55	0.26	0.126	0.149	-0.012
India	18.81	13.33	9.67	0.39	0.161	-0.073	-0.009
Indonesia	9.80	4.67	9.22	0.23	0.275	0.216	0.037
Jordan	4.18	2.76	4.90	0.34	-0.018	-0.079	0.180
Korea	21.12	17.00	8.32	0.51	-0.033	0.128	-0.032
Malaysia	18.39	14.68	7.67	0.49	0.077	0.093	-0.039
Mexico	44.95	32.80	13.17	0.40	0.077	0.093	-0.039
Nigeria	-4.80	-14.44	11.73	-0.29	-0.026	-0.164	-0.100
Pakistan	18.66	15.91	6.95	0.62	0.283	-0.175	-0.165
Philippines	47.87	40.28	11.02	0.60	0.295	0.050	0.068
Portugal	32.12	22.01	13.68	0.38	0.267	0.031	-0.015
Taiwan	37.68	23.69	15.44	0.32	0.079	0.039	-0.060
Thailand	28.28	23.57	8.58	0.56	0.110	0.100	-0.014
Turkey	45.98	22.32	21.01	0.25	0.134	0.152	0.134
Venezuela	26.39	15.58	13.20	0.29	0.244	0.186	0.059
Zimbabwe	17.65	12.16	9.62	0.37	0.263	0.345	0.284
.....							
Industrial:							
Australia	13.73	9.60	7.79	0.36	-0.032	-0.020	-0.029
Austria	23.97	19.76	8.33	0.55	0.135	-0.030	-0.003
Belgium	19.57	17.26	6.14	0.70	0.052	0.070	-0.123
Canada	6.56	5.21	4.68	0.48	-0.018	-0.040	-0.051
Denmark	12.51	10.20	6.20	0.52	-0.109	0.047	-0.009
United Kingdom	15.75	13.33	6.25	0.58	-0.077	-0.108	-0.051
Finland	14.92	11.62	7.47	0.47	0.201	-0.009	0.133
France	20.34	17.51	6.73	0.63	-0.004	-0.004	0.081
Germany	16.56	13.62	6.89	0.54	-0.005	0.024	0.095
Hong Kong	28.47	23.80	8.26	0.55	-0.049	-0.023	-0.015
Italy	15.99	12.28	7.92	0.45	0.091	0.047	0.121
Japan	19.40	15.47	8.05	0.50	0.042	-0.047	0.030
Netherlands	16.10	14.63	4.78	0.80	-0.070	-0.069	0.041
New Zealand	11.92	6.93	8.97	0.29	0.119	0.003	-0.009
Norway	14.27	10.47	7.82	0.41	0.073	-0.020	0.016
Singapore	12.80	9.15	7.44	0.38	0.043	0.047	-0.082
Spain	20.57	17.06	7.59	0.55	0.089	-0.045	-0.131
Sweden	16.82	13.69	7.11	0.52	0.154	-0.062	-0.040
Switzerland	18.71	16.68	5.67	0.73	0.045	0.006	0.004
U.S.A.	11.97	10.71	4.45	0.72	-0.015	-0.062	-0.108

Source: IFC, MSCI, and the author's own calculations.

Note: Starting year and month are January 1984 for all markets except Colombia, Malaysia, Nigeria, Pakistan, Philippines, Taiwan, and Venezuela (January 1985); Portugal (February 1986); and Indonesia (January 1990).

APPENDIX TABLE II

ANNUALIZED STOCK RETURNS AND OTHER FEATURES OF EMERGING AND INDUSTRIAL
MARKETS BASED ON MONTHLY STATISTICS, JANUARY 1994–DECEMBER 1998

Markets	Arithmetic	Geometric	Standard	Sharpe	Autocorrelation		
	Mean (%) <i>x</i>	Mean (%) <i>y</i>	Deviation (%) <i>s</i>	Ratio <i>p</i>	<i>r</i> ₁	<i>r</i> ₂	<i>r</i> ₃
Emerging:							
Argentina	7.80	3.14	8.66	0.20	-0.090	-0.019	-0.171
Brazil	25.32	17.95	11.21	0.12	0.157	-0.021	-0.248
Chile	6.65	4.00	6.73	0.30	0.139	-0.207	-0.035
Colombia	7.69	5.07	6.68	0.34	0.210	-0.030	-0.124
Greece	10.28	7.79	6.49	0.44	-0.125	0.055	-0.142
India	-5.13	-8.85	7.94	-0.38	-0.053	0.227	-0.234
Indonesia	-24.03	-33.10	11.11	-0.46	-0.053	0.227	-0.234
Jordan	2.00	1.31	3.42	0.34	-0.003	-0.043	-0.092
Korea	-33.37	-40.06	9.37	-0.60	0.481	0.203	0.083
Malaysia	-27.19	-32.98	8.97	-0.59	0.208	0.379	0.173
Mexico	0.33	-7.83	11.03	-0.23	0.210	0.085	-0.137
Nigeria	50.88	27.46	18.50	0.26	0.044	0.008	-0.070
Pakistan	-9.41	-13.60	8.39	-0.45	-0.064	-0.091	-0.139
Philippines	-20.07	-24.24	7.89	-0.60	0.239	0.188	0.029
Portugal	18.82	17.37	4.74	0.89	-0.012	-0.075	-0.121
Taiwan	5.04	0.97	8.27	0.12	-0.021	0.081	-0.025
Thailand	-48.30	-56.62	10.20	-0.67	-0.022	0.375	0.110
Turkey	24.93	9.36	16.49	0.19	0.146	-0.147	-0.078
Venezuela	21.16	8.80	13.75	0.20	-0.162	0.088	-0.069
Zimbabwe	7.25	-0.43	10.82	-0.06	0.178	-0.057	0.240
.....							
Industrial:							
Australia	2.76	1.56	4.43	0.28	-0.169	-0.043	-0.055
Austria	-1.16	-2.10	3.96	-0.37	-0.295	0.038	-0.064
Belgium	11.18	10.64	2.86	1.13	-0.249	-0.076	0.078
Canada	9.98	9.01	3.96	0.76	-0.013	0.055	-0.075
Denmark	15.32	14.36	3.83	1.00	-0.415	0.132	0.110
United Kingdom	13.25	12.46	3.47	1.02	-0.188	0.149	-0.008
Finland	21.84	18.49	7.35	0.59	-0.102	0.255	-0.036
France	9.20	8.02	4.43	0.65	-0.228	-0.166	0.178
Germany	14.99	13.85	4.20	0.89	-0.490	0.171	-0.222
Hong Kong	-4.89	-9.06	8.03	-0.36	-0.091	0.127	0.037
Italy	14.79	12.10	6.69	0.53	-0.162	-0.184	0.038
Japan	-6.38	-8.16	5.40	-0.53	0.009	-0.060	-0.091
Netherlands	18.08	17.06	3.86	1.07	0.392	0.077	0.070
New Zealand	2.19	0.90	4.62	0.21	-0.013	-0.168	0.167
Norway	9.43	8.09	4.71	0.61	-0.178	0.014	0.073
Singapore	-10.87	-13.21	5.99	-0.58	-0.148	0.119	0.076
Spain	17.46	15.85	5.03	0.80	-0.137	-0.018	0.069
Sweden	19.66	17.84	5.35	0.80	-0.390	0.072	0.100
Switzerland	18.57	17.44	4.11	1.03	-0.128	-0.032	0.135
U.S.A.	19.22	18.42	3.31	1.31	-0.199	0.145	-0.030

Source: IFC, MSCI, and the author's own calculations.

APPENDIX TABLE III

NUMBER AND DATES OF OUTLIERS IN IFC AND MSCI SAMPLES (JANUARY 1984–DECEMBER 1993 AND JANUARY 1994–DECEMBER 1998)

Markets	January 1984–December 1993 Dates						No.	January 1994–December 1998 Dates				No.
Emerging:												
Argentina	85/07	85/09	89/07	89/08	89/10	91/09	6					
Brazil	84/12	86/04	88/04	89/05	89/07	90/04	9					
	91/02	91/06	92/01									
Chile	83/02						1					
Colombia	91/10	91/11	91/12	92/01			4					
Greece	87/02	87/04	87/10	88/02	89/10	90/05	8					
	90/07	91/03										
India	88/06	90/08	92/03	92/04	92/06	93/04	6	96/03				1
Indonesia	91/10						1	97/09	98/01			2
Jordan	80/02	81/02	81/12	89/03	89/09	90/09	6					
Korea	85/12	92/11					2					
Malaysia	87/10	93/12					2	97/09	97/11	97/12		3
Mexico	87/10	87/11	88/02	88/03			4	94/12	95/01	95/02		3
Nigeria	86/11	87/07	92/04	93/05			4	94/02	95/04			2
Pakistan	91/08	91/12	92/01	92/08			4	94/01	97/08			2
Philippines	85/03	86/10	87/07	87/10	90/10		5	94/01				1
Portugal	87/02	87/09	87/10	87/12			4					
Taiwan	87/10	87/11	90/09				3	94/01				1
Thailand	87/10	87/11	90/10	93/11			4	94/01	97/09	97/11	98/01	4
Turkey	87/07	89/09					2	97/02				1
Venezuela	86/01	90/04	90/09				3	95/12				1
Zimbabwe	84/07	85/06					2	94/03	97/12	98/01		3
.....												
Industrial:												
Australia	87/10						1					
Austria	85/04	89/12	90/10				3					
Belgium	85/10	86/02	87/01	88/02			4					
Canada	87/10						1					
Denmark	87/01						1					
United Kingdom	85/03	87/10					2					
Finland	90/10	93/05					2	94/02	97/09			2
France	87/10	88/01	88/02				3					
Germany	86/05	87/10	90/09	90/10			4					
Hong Kong	87/10	93/12					2	97/10				1
Italy	86/03	93/04					2					
Japan	86/03	90/09	90/10				3					
Netherlands	87/10						1					
New Zealand	87/10						1					
Norway	89/08						1					
Singapore	86/10	87/10	93/12				3	97/10	98/01			2
Spain	87/10	93/08					2					
Sweden	87/10	90/10					2					
Switzerland	87/10	90/10					2					
U.S.A.	87/01	87/10					2					

Sources: IFC, MSCI, and the author's own calculations.

APPENDIX TABLE IV

CORRELATION COEFFICIENTS FOR MONTHLY STOCK RETURNS BETWEEN INDUSTRIAL
AND EMERGING MARKETS

	U.S.	Japan	EU	LA	EA	Czech Republic	Hungary	Poland	Russia
Industrial markets:									
United States (U.S.)	1.00	0.21	0.55	0.30	0.36	0.04	0.39	0.26	0.26
Japan		1.00	0.48	0.14	0.32	0.18	0.07	0.19	-0.04
European Union (EU)			1.00	0.26	0.43	0.21	0.39	0.25	0.27
.....									
Emerging markets:									
Latin America (LA)				1.00	0.39	0.33	0.64	0.52	0.63
East Asia (EA)					1.00	0.15	0.33	0.32	0.41
Czech Republic						1.00	0.55	0.56	0.53
Hungary							1.00	0.57	0.62
Poland								1.00	0.26
Russia									1.00

Source: IFC, MSCI, and the author's own calculations.

Notes: Periods: January 1984–December 1998 for the United States, Japan, EU, LA, and EA; January 1994–December 1998 for Czech Republic, Hungary, and Poland; and February 1997–December 1998 for Russia.