In Search of Global Diversification—
Developed and Emerging Markets | June 2006

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Abstract
Using monthly data from 1991 through 2004, we find evidence for dramatic convergence in properties of globally aggregated developed and emerging markets, greatly limiting the diversifying power of passive emerging markets investing. However, although equity returns in an "average" emerging market follow the rest of the world more closely than a decade ago, emerging markets still constitute a dynamic and heterogeneous investment environment. We re-confirm that, given the importance of country selection, structuring the investment process along industries in a broad emerging markets universe may be premature. At the same time, there is a growing pool of emerging markets, where the importance of industry selection approaches that of country selection. Finally, we show that intra-market commonalities in equity returns offer significant diversification and return opportunities.

1. Introduction
Emerging markets equities are an important investment class. As reported by the United Nations Conference on Trade and Development, foreign direct investments (FDI) into developing and Central and Eastern European markets reached $280 billion in 2000. Even considering the drop to about $190 billion in 2002 and 2003, FDI remains very significant by historical standards. Primary market activity and new equity and bond issuance have also boomed.

Emerging markets have become an integral component of global investment strategies partly because they are viewed as offering additional return opportunities and diversification benefits beyond those available in developed markets. Historically, the high rates of return and low correlation to developed markets have made passive investments in emerging equity markets very attractive. For example, Harvey (1995) found correlation between the International Finance Corporation (IFC) Emerging Market Composite Index and the value-weighted Morgan Stanley Capital International (MSCI) World Index to be only 36% and the average cross-country correlation only 12%. He concludes that the properties of developed and emerging market are quite different, which was good news for international investors in search of diversification. Barry, Peavy, and Rodriguez (1998) came to similar conclusions.

The dramatic influx of capital to emerging markets throughout the 1990s has increased their efficiency and transparency, thereby moving them towards maturity. To the extent that a country is "emerging", it should experience faster economic growth than more mature markets, leading to larger investment returns. As markets mature, volatility should decline and correlation with developed markets should increase, gradually chipping away at the diversification opportunities. To what extent have emerging markets emerged?

To address this question, we consider a case involving investors with an equity portfolio concentrated in developed markets, seeking to enhance their fund's risk adjusted return by investing in emerging market equities. A decade ago, this goal could have been achieved by investing a part of a portfolio in a broad emerging markets index. Given the structural changes in the international marketplace brought about by global integration, a more granular investment approach may be needed now.

The objective of this article is twofold. First, we want to examine the effects of global integration on the traditional passive approach. Second, we want to compare various components of emerging market returns, thereby providing investors with guidance on their relative importance and diversification power. To achieve this objective, we use an innovative, layered return decomposition scheme. The first layer of our model is formed by the traditional *inter-market* factors, such as country, global industry and style. The second layer is driven by market-specific industry and style return commonalities. We refer to the factors in this layer as *intra-market* or *purely local*.

In this article, we do not directly address the question of predictability of emerging market returns. However, Harvey (1995) suggests that the degree of predictability found in emerging markets is greater than in developed markets. He also argues that local information plays an important role in predicting emerging market returns. Cavaglia and Moroz (2002) demonstrate that allocating portfolio value based on local information may form the basis of successful risk-controlled investment strategies in developed markets.

The remainder of this article is organized as follows: In section 2, we analyze a set of global and regional MSCI indices and focus on trends in volatility, correlation, and performance starting in 1991. We relate these trends to the opportunity set of an investor expanding into emerging equity markets. In Section 3, we introduce our asset-return decomposition model, and compare the investment potential of global emerging market industries and countries. We then zoom in on local industry effects and their importance. We present our conclusions in Section 4.

2. Changing Investment Opportunities in Emerging Markets

Historically, the low correlations between developed and emerging markets implied significant independence of emerging and developed market investment bets, and provided great diversification benefits. This is important for portfolio management because the information ratio[i] of an investment strategy is determined in part by the number of *independent* bets that are placed.[ii] The diversifying effect of independent bets reduces risk and improves the overall risk/return ratio.

However, international markets have changed since the mid-1990s in an important way. To illustrate these changes, we compare the MSCI Emerging Markets (MSCI EM) and the MSCI World Index returns calculated from a US dollar perspective.[iii] We concentrate on the “enduring” results by ignoring extreme events. In particular, when calculating descriptive statistics such as correlations and volatilities, we ignore returns during the Asian Crisis of August and September 1990, the Russian default of August 1998, and events of September 2001. Including these extreme events would increase correlation of emerging and developed markets further. This phenomenon has been discussed in the literature on the issue of financial contagion.[iv]

We run a regression analysis where the MSCI EM Index return is decomposed into a developed market component and a specific part:

$$r_{EM} = b\,r_{DM} + e \qquad (1)$$

It follows in the usual way that the Index variance consists of a systematic and a specific part:

$$Var(r_{EM}) = b^2 Var(r_{DM}) + Var(e) \qquad (2)$$

The results of this analysis, estimated using a 36-month rolling window, are presented in Figure 1. The specific and systematic risk values are obtained using β calculated at the end of each 36-month rolling window. Before 1995-1996, the risk of the MSCI EM Index was overwhelmingly specific, providing a good diversification opportunity. A subsequent increase in b , combined with non-monotonic but persistent reduction in specific risk, radically changed the variance composition from almost exclusively specific to largely systematic. This greatly reduced the related diversification benefits.

An increase in b can result from an increase in the ratio of emerging to developed markets volatilities, or from an increase in correlation between the two. Figure 2 shows the 36-month rolling window correlation as well as volatilities for both indices. In 1990 a global investor would have enjoyed only about 40% correlation between the two indices. By 2004 this increased to about 85%.[v] The volatility of the MSCI EM Index is higher than that of MSCI World Index throughout the whole period, although to a varying degree. In the last several years, the volatilities started to converge, contributing to a reduction of b from its high of 1.4 in 2000. As Bekaert and Harvey (1997) point out, the observed increase in correlation and the convergence in volatility are an indication that emerging markets have become more transparent, efficient and integrated.

The phenomenon of increased correlation is not limited to the aggregated markets but may also be observed on a regional level. Table 1 shows correlations of MSCI indices for three emerging regions with the MSCI World. These correlations are not as high as the correlation between MSCI EM and MSCI World. At the same time, they have increased markedly during the last decade, and are currently in the 70-80% range. At these levels, the diversification benefits of investing in broad regional indices have diminished as well.

Table 1 also shows the evolution of the equally weighted average pair-wise correlations of emerging country MSCI indices, and their correlation with the MSCI World. Clearly, the correlations have increased but remain low relative to regional and aggregate market correlations. We conclude that active country allocation still provides significant risk diversification potential.

To summarize, diversification benefits of passive emerging equity investment seem to have diminished over the last 14 years. Since the mid-1990s there has been little benefit from including an aggregate fund of emerging markets in a portfolio. The expectation is, however, that a more quantitative and active approach focusing on country selection and within-market opportunities may still work well.

Index returns bundle together returns due to country, industry, and style selection. For example, return to a country index dominated by raw materials may have a significant industry component. In the following section, we use a return decomposition model to differentiate influences of country, global industry, and within-market effects; and to quantify the diversification potential of different investment options.

3. Country, Global Industry, and Within-Market Effects

3.1. Methodology

In order to deal with the complexities of international investing, it is common to first group assets by either geographic location or by global industry, and then to select assets within each group. This approach stems from the early work by Grinold, Rudd, and Stefek (1989) and Heston and Rouwenhorst (1994,1995), who showed that international equity returns are driven in part by a common component based on the country of domicile, global industry and global style.

One of the important challenges of active management is to decide on the structure of the investment process. The research of Grinold, Rudd, and Stefek (1989) and the subsequent studies of Heston and Rouwenhorst (1994), Griffin and Karolyi (1998), and Rouwenhorst (1999) found country to be the dominant influence. Historically, most investment firms have organized their teams geographically, allocating portions of portfolio value to either individual countries or to broader regions, and then selecting securities within these groups.

A large body of recent literature such as Cavaglia, Brightman, and Aked (2000), Hamelink, Harasty, and Hillion (2001), Cavaglia and Moroz (2002), Brooks and Del Negro (2002), L'Her, Sy, and Tnani (2002), Kritzman and Page (2003), shows an increase in the importance of global industries in determining equity prices. In the developed world, the current consensus is that country and industry selection carry similar levels of importance. Firms subscribing to the industry-centric point of view would organize their teams by industry, allocating portfolio value to global industries and then selecting companies within these segments.

After the choice of a broad grouping scheme has been made, investors may want to turn their attention to within-group return dispersion. Recently, Cavaglia and Moroz (2002) argued for balancing the risk-reward benefits of both global industry and country allocations by simultaneously selecting "local" baskets of securities from around the world. Their approach implies that country and industry influences cannot be completely separated. In other words, there is more to Russian Oil than a combination of Russian Equity and global Oil factors. We use the approach put forward by Stefek (2002) and Puchkov, Stefek, and Davis (2005) that formalizes this idea by employing a layered return decomposition scheme. The first layer of our model is formed by the traditional *inter-market* factors, such as country, global industry and style. The second layer is driven by market-specific industry and style return commonalities. We refer to the factors in this layer as *intra-market* or *purely local*.

The model implementation consists of two steps. In the first step, we use asset-level fundamentals to create detailed factor models of equity returns in local markets. The local factor returns are then estimated monthly using a weighted cross-sectional regression. This can be written mathematically for a market *k* as:

$$r^k = X^k f^k + u^k \tag{3}$$

where r^k is a vector of asset returns , X^k is a matrix of asset exposures to the local factors f^k , and u^k is a vector of asset-specific returns.

In the second step, we determine how much of each local market factor is due to country and global factors and how much arises from purely local factors. Our global factors include a world factor that picks up the overall movement of the global market, as well global industry and style factors. We attribute the return of each local industry factor to the world factor, to its country factor and to a global industry factor. To do this, we mapped each local industry to a single global industry. Since most local style factors have little market exposure, we simply attributed each of their returns to an appropriate global style factor.

More precisely, we decompose the *k*-th market's local factors as follows:

$$\begin{aligned} f^k_{ind_i} &= g_{world} + g_{cntry_k} + g_{ind_i} + \phi^k_{ind_i} \\ f^k_{style_j} &= g_{style_j} + \phi^k_{style_j} \end{aligned} \tag{4}$$

where $f^k_{ind_i}$ and $f^k_{style_j}$ are returns to the *i*-th local industry factor and the *j*-th local style factor respectively, g_{world} is the return to the world factor, g_{cntry_k} is the return to country factor *k,* and g_{ind_i} and g_{style_j} are the global industry and style factors to which local industry *i* and local style *j* have been mapped. The world factor picks up the global market return and the country and industry factor returns are net of the world and of each other.

The terms $\mathbf{f}^k_{ind_i}$ and $\mathbf{f}^k_{style_j}$ represent the purely local returns to industry *i* and style *j*. These components of the model are assumed to be uncorrelated across markets. They differentiate the behavior of industry and styles factors in different markets. For example, they help explain why the returns of U.S. utilities differ from those of German or Japanese utilities.

We then rewrite Equation (4) as $f = Yg + \phi$ where Y is a matrix of exposures of local factors to the broad factors, and combine results of the two steps to obtain equity asset return decomposition into three distinct components:

$$r = XYg + X\phi + u \qquad (5)$$

Here, the first term is due to return of the world equity, global industry, global style, and country factors; the second term is due to return to purely local industry and style factors; and the third term is due to asset-specific return. A more detailed technical description of this approach can be found in Stefek (2002) and Puchkov, Stefek, and Davis (2005).

Each term in Equation (5) corresponds to a different dimension of the investment decision. The first captures effects of country, and global industry and style selection; the second captures the value of within-market factor bets; and the third deals with stock selection. In the next section, we will examine the diversification benefits provided by the first two groups of common-factor returns.

The weight of each local factor in our global model is designed to increase with the US-dollar capitalization of equity assets assigned to that factor. As a result, factors from developed market models have a dominant influence on the estimation of inter-market factors. To remove this bias and to disentangle inter-market factor returns in developed and emerging universes, we first separate global equities into developed and emerging. We then estimate an emerging and a developed markets model, using either emerging or developed equities respectively. To obtain the country and global factors for the developed markets, we include only local factors from the developed market models.[vi] We then perform similar calculations for the emerging markets.[vii]

Finally, as in Section 2, when calculating descriptive statistics such as correlations and volatilities we ignore returns during the Asian Crisis of August and September 1990, the Russian default of August 1998, and September 2001.

3.2. Inter-market sources of equity return

As expected, correlation between developed and emerging market factors is very similar to the correlation between the corresponding MSCI indices. Therefore, we begin our analysis with global industry factors, and follow with an analysis of country factors. In both sections, our aim is to describe the properties of emerging markets as well as to compare them with the more familiar properties of developed markets. We then switch gears and move on to evaluating the relative importance of the intra-market effects.

Research by Serra (2000), Bruner, Conroy, and Li (2004), Estrada, Kritzman, and Page (2004), and Puchkov, Stefek, and Davis (2005) demonstrated that, on average, the variation in emerging country returns dominates that of global industries. The question remains, how different are the industry influences in developed and emerging markets? In this section, we extend the previous findings by making a more detailed, industry-by-industry, comparison.

In our model, industry factor returns are estimated net of the respective market factor return. This makes them dependent on the average industry composition of a market. For example, in a market dominated by raw materials, returns to Materials industry, estimated as a difference between the average returns of firms engaged in materials-related activities and the market return, are expected to be small. In a limiting case of a single-industry market, the industry factor return is exactly zero. Therefore, to compare industry effects *across* markets we will concentrate on the sums of industry and market factor returns. The sum is equivalent to the return on a long-only industry-tilted portfolio.

We start by examining the evolution of correlations between emerging industry-tilted returns and the developed market "world equity" factor return over time. On average, the correlations have increased from 39% in 1991-1995 to 69% in 2001-2004. With the exception of the Precious Metals industry, which shows correlation of only 21-31%, this increase mimics the increase in correlation between the aggregate markets.

The reason for this similarity becomes apparent in the top panel of Figure 3, where we plot monthly returns to the emerging market equity factor together with a range of industry returns shown by the gray band.[viii] The range can be interpreted as the opportunity set available by tilting on a particular industry. For comparison, we reproduce these results for developed markets in the bottom panel of Figure 3. In both cases, industry returns follow their respective market return in a relatively tight band, which is narrower than the typical monthly variations in market return. Industry-tilted returns are not dramatically different from each other or the market factor, limiting the corresponding range of opportunities in both markets. The only exception is the 1998-2001 period of the technology-media-telecom (TMT) bubble. During this period industry dispersion in the developed markets increased considerably, reflecting a huge disparity in returns between TMT and other industries.[ix]

We continue this theme in Table 2, where we report monthly volatilities of global industry factors, this time net of the respective market return. For comparison, we report the corresponding market's equity factor volatility as well. With the exception of Precious Metals, industry volatility is small compared to the volatility of the corresponding market; the volatilities of industry-tilted portfolios are dominated by the market factor. Only occasionally, mostly during the 1/1996-12/2000 period dominated by the TMT bubble, did industry volatility increase to levels above market volatility.

The relatively small volatility of most industry-specific returns, in combination with their dependence on the industry composition of a market, makes it difficult to estimate pair-wise correlations across the emerging-developed boundary reliably. However, volatility levels are quite similar. Precious Metal is the only industry where the industry-specific component dominates the market so that pair-wise correlation can be calculated. The correlation estimated on the most recent period 1/2001-11/2004, net of the market factor, is approximately 70%. This high degree of co-linearity implies that a Precious Metals portfolio contains essentially the same active bet in both markets; it appears that on average it does not matter much where one digs for gold.

Overall, it appears that emerging and developed markets are tightly integrated at the industry level. In addition, active industry returns are small compared to market fluctuations. This reduces new opportunities available to a developed market investor who is willing to venture into emerging markets while structuring the new investments along industry lines.

The role of country selection in emerging market returns was addressed in a number of previous research publications. We point readers to Serra (2000), Bruner, Conroy, and Li (2003), Estrada, Kritzman, and Page (2004), Fernandes (2005), and Puchkov, Stefek, and Davis (2005), among others. The general conclusion of the prior research is that the country-specific component of asset returns is very significant and, therefore, investing in an emerging country should have significant diversification benefits for a developed markets portfolio. This may seem to contradict somewhat the results of Section 2, which suggest that current investment into an *average* emerging country seems to brings little diversification. In this section we perform a more detailed, country-by-country, analysis of the emerging markets in an attempt to bring some insight into this apparent contradiction.

Similarly to description of our analysis of industry tilts, a country-tilted return is given by the sum of the individual country factor return and the corresponding market factor return. In the left-hand side of Table 3 we report the correlations of emerging country-tilted returns with the developed market equity factor return over three periods. The average equally weighted correlation was in the mid-20% during the 1990s, rising to above 37% after 2001. Even in the light of the recent increase, the average correlation remains low relative to that observed between the aggregate equity markets. It is also smaller than the regional correlations. On an individual country level, the picture is not uniform. Recent correlations in Asia, for example, range from 9.4% (China) to 68.2% (South Korea). We also note that correlation between emerging and developed market factors (which are square root of US dollar capitalization weighted) increased much faster than the equally weighted country correlations, signaling significant heterogeneity in country returns.

To illustrate differences in magnitude of emerging industry and country return dispersion, in Figure 4 we again present monthly market factor returns, this time overlaying a range of country-specific returns shown by the gray band. The range of emerging country returns is considerably wider than the typical size of month-to-month variations in the market return, suggesting a high degree of geographical diversity. It is also evident that the range of emerging country returns constitutes a much wider band compared to the industries, seen in the top panel of Figure 3. In comparison, developed countries, shown in the lower panel of Figure 4, demonstrate less idiosyncratic behavior[x]. Here, return dispersion is comparable to that of industries, excluding Precious Metals.

We now turn our attention to the volatilities of individual country factors, shown in the right-hand part of Table 3. Clearly, while the average volatility is still higher than that reported for industry factors, it has come down during the last decade. This is consistent with results presented in Section 2, and with the notion of the reduced importance of geographical borders. In comparison, the average volatility of developed country factors is about 3% in the 2001-2004 period.

On a more granular level, country volatilities present a highly heterogeneous picture. The most recent volatilities range from 3% per month for Mexico to 24% per month for Zimbabwe. For some countries, such as Chile, volatility has come down steadily over the last decade. In the most recent period, five countries showed specific volatility below or equal to that of the market. In each period, however, there are countries where volatility flares up: China, Hungary, Poland and Turkey in 1991-1996; Russia and Turkey in 1996-2001; Argentina and Zimbabwe in 2001-2004. As a result, the largest country volatilities are consistently above the average size of monthly market fluctuations. On the one hand, this singles out the country dimension as the most important among the inter-market factors. On the other hand, the dynamic nature of the process means that capitalizing on the country dispersion requires a more careful choice of country. In contrast, the typical size of country-specific volatility in developed markets is smaller than the average market volatility. This makes active strategies based on developed country selection vulnerable to unexpected market fluctuations.

In recent years, a few emerging countries, such as Chile, Malaysia, Mexico, and South Africa, have shown a marked decrease in country-specific volatility. In each of these countries, volatility was coming down more or less steadily over the last 14 years, reaching levels typically observed in developed markets. If this process does not reverse itself, as it did in Argentina, the balance between industry and country selection in this subset of emerging markets should become similar to that in the developed markets.

Ankrim and Ding (2002) point out that dispersion of investment results is directly related to the cross-sectional dispersion of stock returns. To gain a better understanding of the drivers of investment performance in individual emerging countries, we examined the cross-sectional dispersion of asset returns in the estimation universes of the corresponding Barra risk models.[xi] We define cross-sectional volatility of returns at time *t*, or $CVS_t(r)$, relative to zero return, as:

$$\begin{aligned} CVS_t^2(r) &= \left\langle r_t^2 \right\rangle \\ \left\langle r_t^2 \right\rangle &= \sum_i \omega_{i,t} r_{i,t}^2 \end{aligned} \tag{6}$$

Here, r_t is a vector of asset returns at time *t*; $\langle \ldots \rangle$ defines a mean where $r_{i,t}$ is a return to asset i at time t and $\omega_{i,t}$ is the capitalization-based weight of asset i.

For a portfolio composed of assets in market *k,* we can write the single-market return decomposition as:

$$
\begin{aligned}
r^k &= X^k f^k + u^k = \\
&\quad r^k_{country} + \left(X^k_{industry} f^k_{industry} - r^k_{country} \right) + X^k_{style} f^k_{style} + u^k
\end{aligned}
\tag{7}
$$

The first term in the right-most part of Equation (7) quantifies contribution to asset returns from country movements, the second term reflects contribution of intra-country industry returns, the third describes contribution of style factors, and finally the last term is the asset-specific return.

Dropping the country index, we write the cross-sectional variance due to industries relative to a country return at time *t* as:

$$
CVS^2_{industry,t}(r) = \left\langle \left[X_{industry,t} f_{industry,t} - r_{country,t} \right]^2 \right\rangle \tag{8}
$$

The country return in our model is the sum of the emerging market "world" equity factor, g_{world} , and respective country factor, $g_{country}$. The cross-sectional variance due to country return, relative to the emerging market factor return, is simply the square of the country factor return:

$$
CVS^2_{country,t}(r) = \left\langle \left[r_{country,t} - g_{world,t} \right]^2 \right\rangle = g^2_{country,t} \tag{9}
$$

In Figure 5 we examine the evolution of the relative magnitude of the cross-sectional variance attributable to industry and country effects, defined as $CVS^2_{industry,t}(r) / \left(CVS^2_{industry,t}(r) + CVS^2_{country,t}(r) \right)$, for several emerging markets. In some markets, the contribution to the cross-sectional volatility from the two effects converged significantly during the last decade. For example, in modern South Korea the choice of industry is even more important than the choice of country. In Malaysia, the two effects were roughly similar for the last five years, whereas during and after the Asian crisis of 1997 country effects dominated. In markets such as China and Russia, the overall market movements influence asset returns more than the intra-country industry dispersion.

While on average emerging markets are integrating into the global marketplace, they are an uneven lot. Even as more and more emerging countries move together, there are still those that move in their own way. This is hardly surprising. Emerging countries have highly diverse political and economic structures, sharply distinguishing them from each other. Stable political establishments as well as ongoing economic and financial integration in developed countries lessen the importance of geographical boundaries while internal political and economic instabilities introduce idiosyncrasies. These effects should to be less pronounced in geographically diversified industries, where country-specific forces average out. Indeed, this is what we observed in the previous section.

To conclude, even in the environment of global integration, the heterogeneous nature of emerging markets leaves a considerable potential for return diversification. A careful analysis of local information may allow one to capitalize on the significant remaining cross-country return dispersion using country-based active management strategies. At the same time, increasing attention must be paid to the country allocation decision as the *average* emerging country return becomes more and more similar to the aggregate developed market return.

3.3. Intra-market sources of equity return.

Local information is important, and even more so in the environment of diminishing dispersion due to inter-market variables. An overlay based on purely local industry factors can be used to enhance a traditional global industry or country-based international investment strategy. As is described in Section 3.1, the purely local factors represent the intra-market commonalities in equity returns not captured by the inter-market factors. These commonalities may exist due to unique country traditions, government regulations, and industry structure. In this section, we examine the investment implications of leveraging this approach.

Large cross-sectional dispersion between drivers of asset return translates into large performance differentials. To get a feel for the importance of the purely local factors, we have estimated the average equally weighted cross-sectional volatility of purely local industry returns grouped by market in three periods starting in 1991. The cross-sectional volatility of purely local factors is defined as:

$$CSV_{t,purely\ local}^{2} = \frac{1}{K}\sum_{i=1}^{K}(\phi_{i,t} - \frac{1}{K}\sum_{i=1}^{K}\phi_{i,t})^{2} \qquad (10)$$

where summations are over K purely local factor returns ϕ_i observed at time t. The purely local factor returns ϕ_i were estimated through global regression (4).

The numbers provide an estimate for the average return variation among managers placing investment bets on within-country industry relationships. The results are reported in Table 4 for emerging and Table 5 for developed markets.[xii] The cross-sectional volatility remained relatively constant throughout 1991-2004 in both markets, with some increase during the period of TMT exuberance. In the developed markets, the variation is smaller, consistent with their more integrated nature.

It is interesting to compare the cross-sectional volatilities of purely local returns to the time-series volatilities of country factors. As can be seen in Table 3 and Table 4, the reduction in average emerging country volatility over the last 14 years has boosted the relative importance of purely local factors, although country volatility still remains larger than the purely local dispersion. In developed markets, average time-series volatility of country factor returns was 2.9% over the 2001-2004 period. This is almost the same as the average cross-sectional volatility of purely local factors shown in Table 5, a notable change from the 1991-1995 period when the average country factor volatility was 4.1%. This suggests that the investment potential of purely local industries is of the same order as that of an active developed country timing strategy.

We would like to identify a group of factors that have the largest impact on asset dispersion in each one of the broad emerging and developed investment universes. To do this, we compare average equally weighted cross-sectional volatilities of purely local industry, country, and global industry returns in Table 6.[xiii] To observe the dynamics, we report our results for three periods. In developed markets, we see a relative lessening of country dominance. In the 2001-2004 period, all of the three components demonstrate roughly similar volatilities implying comparable importance for investment performance. In other words, purely local industry based strategies may be as rewarding as the more traditional country or global industry based ones. In emerging markets, the country dispersion has decreased over the last 14 years as well but remains dominant. The purely local industries are a distant second whereas global industries demonstrate the smallest dispersion.

4. Conclusions

Historically, emerging markets have offered high rates of return and low correlation with developed markets, which made them an attractive investment opportunity. Since the mid-1990s, the correlation between aggregate markets, represented by MSCI EM and MSCI World indices, started to increase and by the late 1990s it reached 75-80%, even when shocks like the Russian default of 1998 are excluded. Correlations of major emerging regions with the aggregate developed market have reached historically unprecedented levels as well. This makes the usual low-correlation/high-reward argument less convincing. In the current environment the aggregate emerging market provides significantly fewer opportunities than a decade ago thus reducing the diversification value of passive investing.

On a more granular level, the situation is more promising. In particular, we find that, although an average emerging country is moving towards integration into the global marketplace, the distribution of emerging country returns is still very heterogeneous. This is likely a result of highly diverse economic and political situations. Some of the countries remain highly idiosyncratic, keeping the overall cross-sectional range of emerging country returns significant. An opportunity to capitalize on this disparity still makes emerging markets an important frontier for active managers.

Returns to the geographically diversified industry-specific factors have volatilities similar to those of their developed counterparts, typically smaller than the volatility of the aggregate market. We notice, however, that returns to an exceptionally volatile Precious Metals industry are 70% correlated across the developed-emerging boundary thus providing limited new opportunities to a developed markets investor. Given the much larger dispersion of country returns, we re-confirm that structuring the investment strategy along global industry lines in emerging markets remains premature. At the same time, there appears to be a growing pool of countries demonstrating country-specific volatilities of magnitude usually observed in developed world. As a result, in this subset of emerging equity, industry and country selection carry comparable weights similar to the situation in developed markets.

Finally, our model for equity returns allows us to explore previously neglected intra-market influences. We find that local industry behavior can significantly affect equity returns. Indeed, these purely local effects are second only to the country selection in influencing return dispersion in emerging markets. In the developed regions, the range of returns attainable through exploiting these influences is comparable to that resulting from country or global industry bets.

What does this mean for investors aiming to harvest additional diversification? The answer is no longer clear-cut and depends on investment options available. In the broader emerging universe, one can concentrate on finding active managers with a strong record of accomplishment in country specific research as opposed to investing with industry or sector specialists. If investment options are limited to the more developed of the emerging markets, industry selection skills gain in importance. Furthermore, hiring managers who are capable of exploiting the independent and considerable potential of within market relationships should provide an opportunity to boost performance.

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Figure 1 Top panel: MSCI EM Index b against the MSCI World Index estimated from Equation (1); Middle panel: Specific risk estimated for the MSCI EM Index in a 36-month rolling window using end-of-the-window b against the MSCI World Index; Lower panel: Evolution of composition of variance of MSCI EM Index.

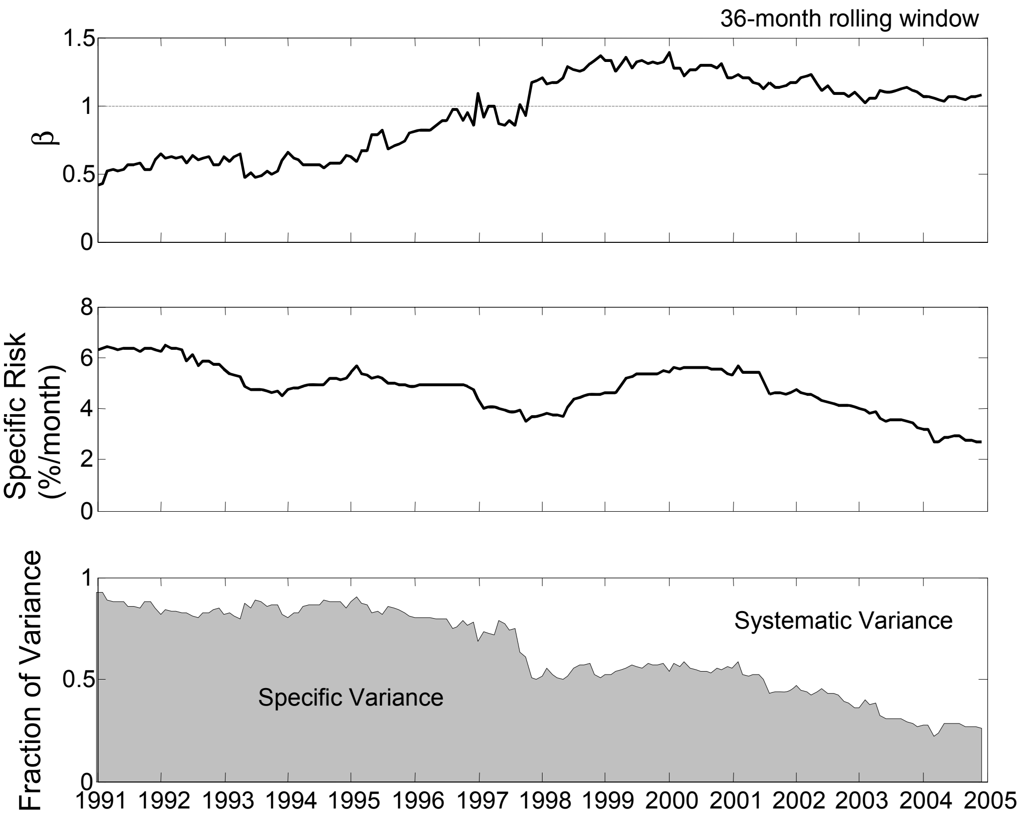

Figure 2 Correlation (top panel) and volatilities (bottom panel) of MSCI World and MSCI EM Indices estimated in a 36-month rolling window.

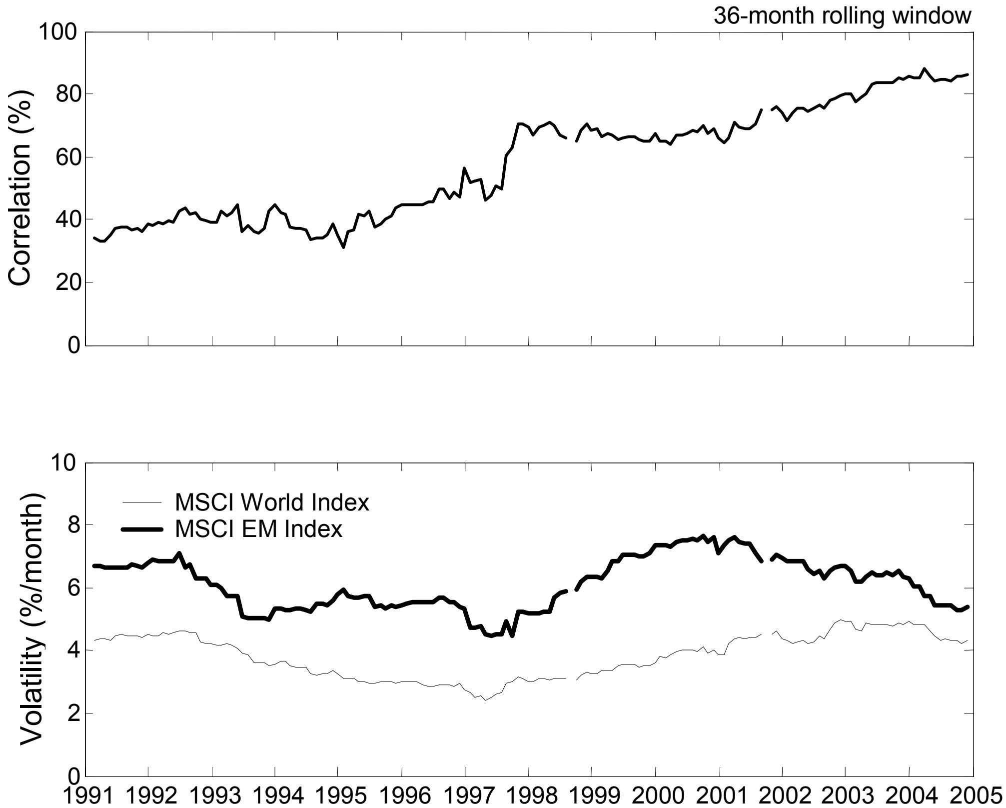

Figure 3 Market factor return and range of industry returns for emerging (top panel) and developed (bottom panel) markets.

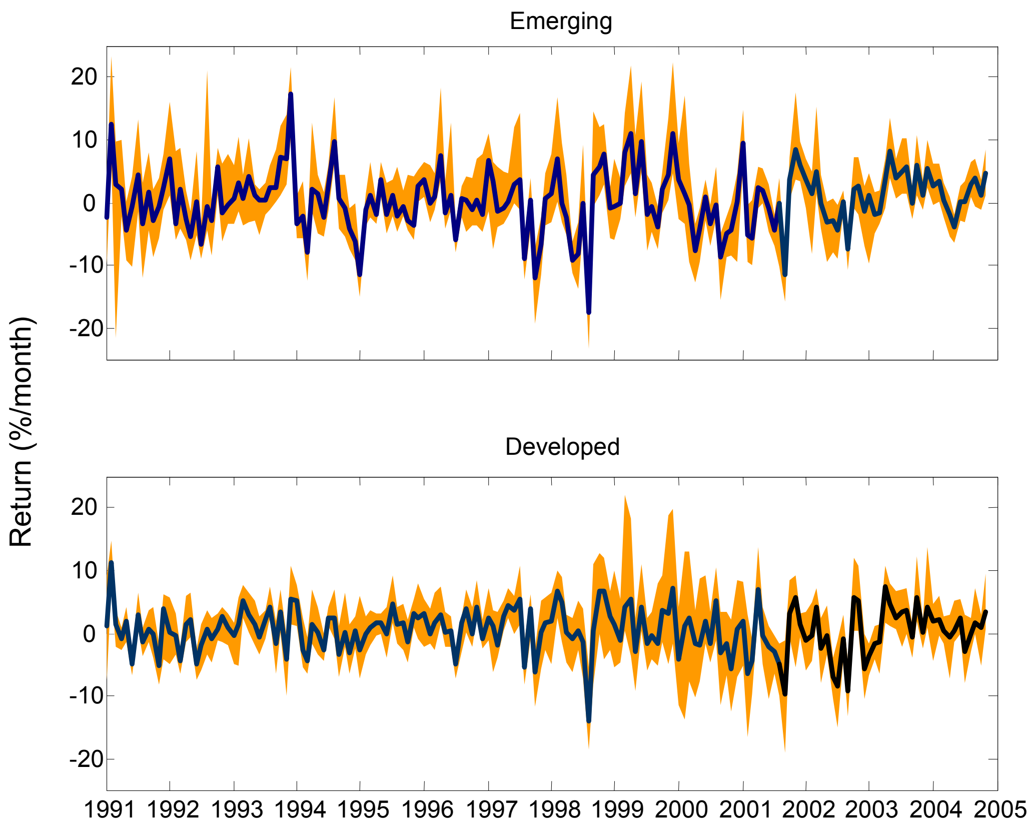

Figure 4 Market factor return and range of country returns for emerging (top panel) and developed (bottom panel) markets.

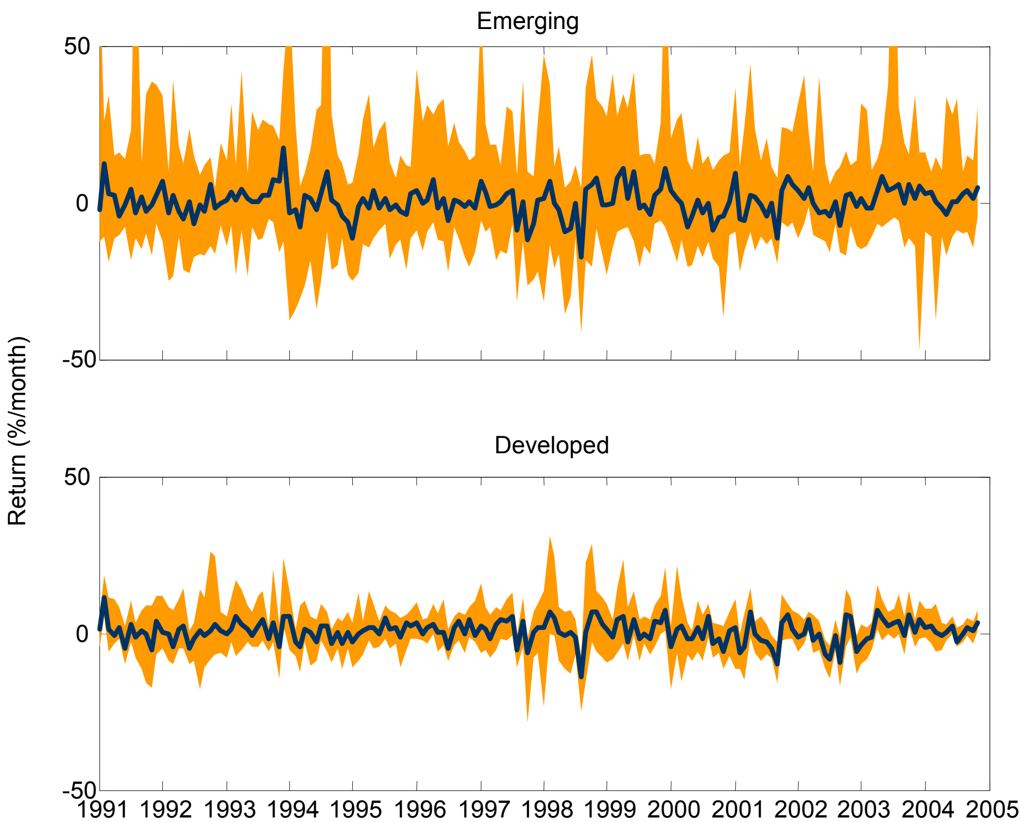

Figure 5 Fraction of cross-sectional variance attributable to country factors (above line) and to industry factors (below line) in four emerging markets. The curves are 12-month moving average.

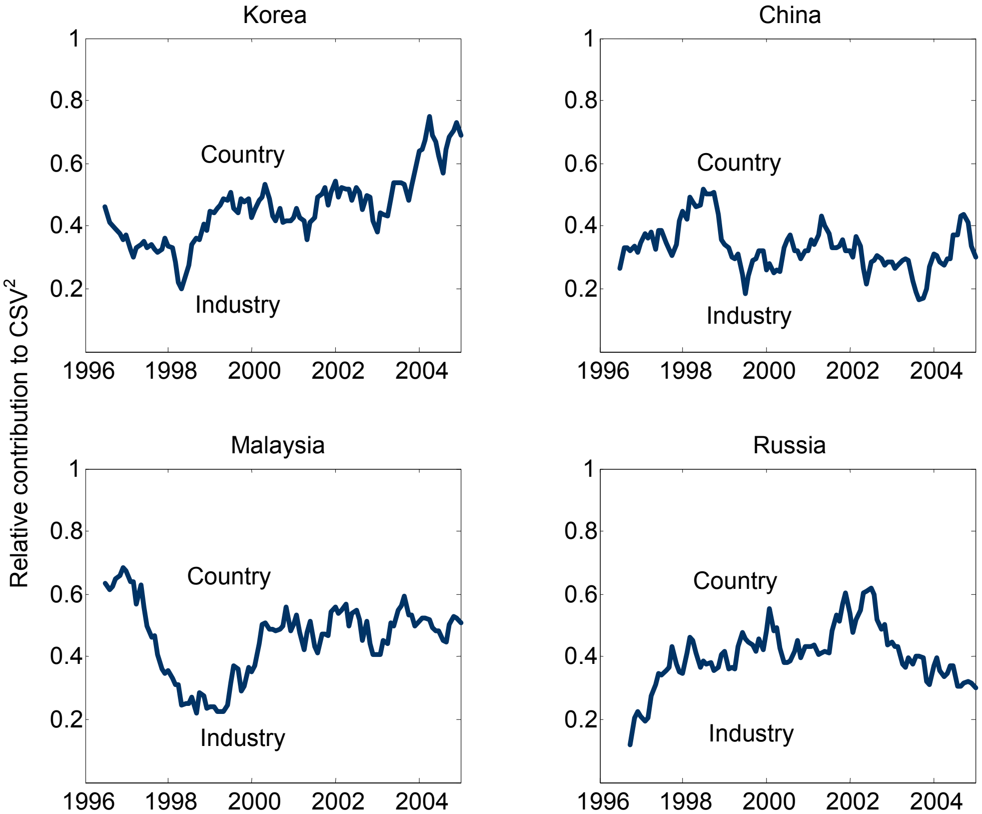

Table 1 Correlations of emerging markets free and regional emerging markets indices with MSCI World Index. Also presented is an average pair-wise emerging country correlation.

	1991-1995	***1996-2000***	***2001-2004***
Correlations with MSCI World Index			
Emerging Markets	43.6%	69.3%	83.4%
Emerging Asia	28.1%	62.3%	69.6%
Emerging Lat. America	32.2%	59.5%	80.2%
Emerging Europe	29.4%	43.3%	69.0%
Average emerging country	13.4%	32.1%	42.7%
Average pair-wise country correlation			
	12.6%	23.3%	27.3%

Table 2 Volatilities of industry factors in developed and emerging markets.

	1991-1995		***1996-2000***		***2001-2004***	
	Emerging	Developed	Emerging	Developed	Emerging	Developed
Alcohol & Tobacco	2.3%	1.8%	1.6%	3.2%	1.1%	2.4%
Automobiles	2.1%	1.6%	1.9%	2.2%	1.7%	2.3%
Construction	1.5%	1.9%	1.4%	1.8%	1.2%	1.2%
Conglomerates	2.0%	0.7%	2.3%	1.3%	1.0%	1.1%
Electrical	2.3%	1.8%	4.7%	3.8%	3.9%	3.3%
Energy	3.2%	3.0%	2.0%	5.0%	1.7%	3.7%
Financials	1.7%	1.0%	1.7%	1.8%	0.9%	0.8%
Food	1.4%	0.9%	1.4%	2.3%	1.0%	1.8%
Heavy Manufacturing	2.8%	1.0%	2.2%	2.0%	2.0%	1.9%
Insurance	2.7%	1.4%	2.7%	2.7%	1.5%	1.8%
IT	2.6%	2.6%	5.5%	4.9%	2.9%	2.5%
Light Manufacturing	1.7%	1.5%	1.1%	1.4%	0.9%	1.0%
Material	1.2%	1.0%	1.3%	2.0%	1.5%	1.5%
Media	5.7%	1.1%	3.3%	2.0%	2.5%	1.7%
Mining	2.5%	2.1%	2.7%	3.9%	1.9%	4.0%
Pharmaceuticals & Health	2.4%	1.8%	2.0%	2.8%	2.0%	2.4%
Precious metals	7.1%	6.6%	7.2%	9.5%	7.1%	9.3%
Property	3.4%	1.4%	1.6%	1.6%	1.3%	1.4%
Telecom	1.9%	1.6%	2.8%	3.3%	1.7%	2.6%
Transportation	2.4%	1.2%	1.6%	1.8%	2.1%	1.1%
Travel & Entertainment	2.6%	1.4%	2.2%	1.8%	1.6%	1.4%
Textiles	2.2%	1.7%	1.4%	2.9%	1.5%	1.8%
Utilities	1.9%	1.5%	2.6%	2.3%	1.5%	1.9%
Mean	*2.6%*	*1.8%*	*2.5%*	*2.9%*	*1.9%*	*2.3%*
Market	*4.7%*	*3.0%*	*5.0%*	*3.2%*	*3.9%*	*4.0%*

Table 3 Correlations of emerging country returns (including emerging market factor) with the developed market equity factor; and monthly volatility of emerging country factor returns (net of emerging market factor).

	Correlation of country returns with developed market factor			*Monthly volatility of country factors*		
	1991-1995[xiv]	***1996-2000[xv]***	***2001-2004***	***1991-1995[xiv]***	***1996-2000[xv]***	***2001-2004***
Argentina	25.6%	56.7%	38.7%	19.0%	5.2%	7.9%
Bahrain		-4.0%	41.4%		7.3%	3.9%
Brazil	66.1%	60.0%	61.3%	6.7%	6.8%	4.9%
China	5.3%	-14.4%	9.4%	23.9%	9.2%	6.0%
Chile	26.7%	39.7%	48.4%	7.2%	4.6%	4.1%
Colombia	-6.3%	14.7%	26.5%	12.4%	7.5%	4.5%
Czech Rep.	40.8%	16.4%	50.6%	7.9%	7.3%	3.9%
Egypt		-2.6%	21.0%		8.5%	6.0%
Hungary	51.5%	46.3%	67.6%	14.6%	10.0%	4.6%
Indonesia	43.5%	53.6%	38.8%	7.4%	9.5%	6.8%
Israel	50.6%	51.3%	65.0%	7.3%	6.0%	4.8%
India	8.3%	12.1%	42.9%	9.2%	7.3%	5.8%
Jordan	16.9%	37.8%	28.5%	6.0%	5.3%	5.2%
South Korea	21.6%	41.2%	68.2%	5.9%	11.6%	5.9%
Sri Lanka	-0.3%	36.7%	12.4%	9.6%	6.8%	8.8%
Malaysia	35.6%	52.2%	42.2%	6.3%	9.2%	3.6%
Morocco		5.4%	11.9%		6.7%	5.4%
Mexico	47.3%	66.3%	63.3%	6.6%	5.2%	3.0%
Nigeria	20.8%	13.9%	25.7%	6.9%	8.3%	5.9%
Oman		-6.7%	18.4%		8.2%	4.9%
Peru	34.4%	27.6%	31.3%	10.1%	5.7%	5.9%
Philippines	41.1%	51.2%	39.4%	6.6%	8.2%	5.2%
Pakistan	-2.0%	21.5%	21.8%	10.0%	9.1%	7.7%
Poland	53.3%	21.1%	54.9%	17.9%	9.3%	5.5%
Russia		44.8%	48.9%		15.5%	5.7%
South Africa	23.8%	61.8%	70.0%	4.4%	4.3%	3.1%
Slovak Rep.		-15.4%	20.0%		9.3%	8.1%
Saudi Arabia		16.2%	7.4%		6.6%	6.0%
Thailand	18.8%	57.0%	46.0%	5.9%	10.0%	5.0%
Turkey	-5.2%	28.3%	45.2%	14.9%	18.0%	9.3%
Taiwan	24.3%	32.5%	32.8%	8.6%	6.6%	6.4%
Venezuela	6.4%	11.2%	30.3%	11.2%	11.6%	7.5%
Zimbabwe	28.5%	18.2%	11.0%	10.4%	9.1%	24.9%
Mean	*26.1%*	*28.9%*	*37.6%*	9.9%	8.3%	6.3%
Market Factor	*38.8%*	*65.3%*	*73.1%*	4.7%	5.0%	3.9%

Table 4 Cross-sectional standard deviation of purely local industry returns for emerging markets.

Country	1991-1995	1996-2000	2001-2004
Argentina	4.1%	4.2%	5.2%
Bahrain		2.0%	1.8%
Brazil	4.4%	5.4%	4.4%
China	4.2%	4.0%	2.3%
Chile	4.0%	3.4%	2.9%
Colombia	3.0%	3.8%	3.4%
Czech Rep.	4.1%	6.1%	5.0%
Egypt		4.3%	4.4%
Hungary	2.5%	4.4%	3.8%
Indonesia	4.2%	6.3%	5.0%
Israel	3.6%	5.0%	3.9%
India	4.1%	6.0%	5.0%
Jordan	2.1%	2.6%	2.5%
South Korea	3.8%	6.5%	4.3%
Sri Lanka	2.3%	3.7%	4.2%
Malaysia	3.7%	3.6%	2.3%
Morocco		1.2%	1.8%
Mexico	2.2%	2.1%	1.6%
Nigeria	2.4%	5.7%	4.3%
Oman		3.3%	2.6%
Peru	5.4%	5.3%	5.9%
Philippines	4.6%	6.3%	5.5%
Pakistan	4.7%	5.0%	3.7%
Poland	4.4%	5.0%	3.4%
Russia		7.5%	5.0%
South Africa	4.1%	5.0%	3.9%
Slovak Rep.		4.8%	4.1%
Saudi Arabia	1.4%	2.6%	2.4%
Thailand	6.3%	7.5%	6.0%
Turkey	7.7%	8.2%	5.7%
Taiwan	4.2%	4.6%	5.6%
Venezuela	5.1%	6.5%	5.4%
Zimbabwe	2.2%	3.4%	5.0%
Mean	*3.9%*	*4.7%*	*4.0%*

Table 5 Cross-sectional standard deviation of purely local returns for developed markets.

Country	1991-1995	1996-2000	2001-2004
Australia	2.7%	3.1%	2.7%
Canada	2.6%	3.1%	3.0%
Continental Europe	2.1%	2.7%	2.2%
Hong Kong	3.1%	4.5%	2.9%
Japan	2.7%	3.6%	3.3%
New Zealand	2.5%	2.3%	1.6%
Singapore	2.8%	4.2%	2.9%
UK	2.9%	3.6%	3.1%
US	2.8%	3.7%	3.2%
Mean	*2.7%*	*3.4%*	*2.8%*

Table 6 Cross-sectional standard deviation of purely local industry factors, country factors, and global industry factors.

	Cross-sectional Volatility	1991- 1995	1996- 2000	2001- 2004
Developed Markets	Purely local industry	2.4%	3.1%	2.6%
	Country	3.6%	3.7%	2.6%
	Global Industry	1.6%	2.5%	2.1%
Emerging Markets	Purely local industry	4.9%	5.8%	4.7%
	Country	11.5%	8.4%	6.8%
	Global Industry	2.4%	2.4%	1.8%

[i] *We are grateful to Oren Cheyette, Lisa Goldberg, Neil Gilfedder, Jens Langewand, Christopher Miller, Elizabeth Penades, Edouard Senechal, Aamir Sheikh, and Dan Stefek for suggestions and helpful comments.*

[i] Information ratio is defined as the ratio of active return to active risk. See Grinold and Kahn (1999).

[ii] The Fundamental Law of active management states that information ratio can be approximated by a product of information coefficient, quantifying ability to forecast returns, and a square root of the number of independent bets. For reference see Grinold and Kahn (1999).

[iii] Notice that MSCI World Index does not contain emerging markets.

[iv] For an overview on the literature on financial contagion see, for example, Roberto Rigobon (2002)

[v] Bruner, Conroy, Li, O'Halloran, and Lleras (2003) reported similar results in their Research Foundation of AIMR Monograph.

[vi] These include models for Australia, Canada, Japan, Hong Kong, New Zealand, Singapore, UK, US, and Continental Europe.

[vii] Emerging market models include Argentina, Bahrain, Brazil, China, Chile, Colombia, Czech Republic, Egypt, Hungary, Indonesia, Israel, India, Jordan, Korea, Sri Lanka, Malaysia, Morocco, Mexico, Nigeria, Oman, Peru, Philippines, Pakistan, Poland, Russia, South Africa, Slovak Republic, Saudi Arabia, Thailand, Turkey, Taiwan, Venezuela, and Zimbabwe.

[viii] Excluding Precious Metals industry.

[ix] See, for example, Puchkov, Stefek, and Davis (2005)

[x] Since Greece was just recently reclassified as a developed country it was not included.

[xi] While we limit the total number of assets in each portfolio to no more than 500 every month, the constraint is usually not binding.

[xii] For some emerging markets data become available only since 1996. Also, we treat 15 continental Western European countries as a single market.

[xiii] We do not include Greece in the list of developed markets and we do not include Precious Metals industry in the list of global industries. However, even if we include these factors, the results do not change significantly.

[xiv] Coverage of some countries started later in the period: Brazil - 12/1994, China, Indonesia, Peru, and Sri Lanka - 02/1993, Czech Rep. - 02/1994, Hungary and Poland - 09/1993, Israel and South Africa - 01/1993, Malaysia - 09/1991, Mexico - 05/1992.

[xvxvxv] Coverage of some countries started later in the period: Bahrain and Oman - 05/1998, Egypt, Morocco, Russia, and Slovak Rep. - 02/1996.

Notice and Disclaimer

About MSCI Barra

MSCI Barra develops and maintains equity, fixed income, multi-asset class, REIT and hedge fund indices that serve as benchmarks for an estimated USD 3 trillion on a worldwide basis. MSCI Barra's risk models and analytics products help the world's largest investors analyze, measure and manage portfolio and firm-wide investment risk. MSCI Barra is headquartered in New York, with research and commercial offices around the world. Morgan Stanley, a global financial services firm and a market leader in securities, asset management, and credit services, is the majority shareholder of MSCI Barra, and Capital Group International, Inc. is the minority shareholder.

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