Local return factors and turnover in emerging stock markets

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Abstract

The paper shows that the factors that drive cross-sectional differences in expected stock returns in emerging equity markets are qualitatively similar to those that have been found in developed equity markets. In a sample of more than 1700 firms from 20 countries, I find that emerging market stocks exhibit momentum, small stocks outperform large stocks, and value stocks outperform growth stocks. There is no evidence that high beta stocks outperform low beta stocks. A Bayesian analysis of the return premiums shows that the combined evidence of developed and emerging markets strongly favors the hypothesis that similar return factors are present in markets around the world. Finally, the paper documents a strong cross-sectional correlation between the return factors and share turnover. Yet, it is unlikely that liquidity can explain the emerging market return premiums.

1. Introduction.

There is growing empirical evidence that multiple factors are cross-sectionally correlated with average returns in the United States. Measured over long time periods, small stocks earn higher average returns than large stocks (Banz (1981). Fama and French (1992,1996), Lakonishok, Shleifer and Vishny (1994) show that value stocks with high book-to-market (B/M), earnings-to-price (E/P), or cash flow to price (C/P) outperform growth stocks with low B/M, E/P, or C/P. In addition, stocks with high return over the past 3-months to 1-year continue to outperform stocks with poor prior performance (Jegadeesh and Titman (1993)). The evidence that beta is also compensated for in average returns is weaker (Fama and French (1992), Kothari, Shanken, and Sloan (1995))

The interpretation of the evidence is strongly debated[1]. Some believe that the premiums are a compensation for pervasive risk factors, while other attribute them to firm characteristics or an inefficiency in the way markets incorporate information into prices. Yet others argue that the premiums may be biased by survivorship or data snooping. A motivation for examining international markets is that to the extent that these markets move independently from the U.S., they provide independent samples to study return premiums. In this spirit, a number of researchers have recently shown that size, value, and momentum also help to explain the cross-section of average returns in developed equity markets outside of the United States[2].

This paper examines the sources of return variation in emerging stock markets. From the

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[1] Participants in this debate include Berk (1995), Daniel and Titman (1996), Fama and French (1996), Haugen and Baker (1996), Kothari, Shanken and Sloan (1995), Lakonishok, Shleifer and Vishny (1994), Lo and MacKinlay (1990), Loughran (1997), and MacKinlay (1995).

[2]For example, Fama and French (1998) report a value premium in a sample of 13 developed markets, and Heston, Rouwenhorst and Wessels (1998) and Rouwenhorst (1998) document a return premium for beta, size, and momentum in European countries. Haugen and Baker (1996) examine twelve return factors in five developed countries. Chan, Karceski, and Lakonishok (1997) compare return factors in three developed countries.

perspective of collecting independent samples, emerging market countries are particularly interesting because of their relative isolation from the capital markets of other countries. Compared to developed markets the correlation between most emerging markets and other stock markets has historically been low (Harvey (1995)), and until recently many emerging countries have restricted investment by foreign investors. Interestingly, Bekaert and Harvey (1995) find that despite the recent trend towards abolition of these restrictions and the substantial inflows of foreign capital, some emerging equity markets have actually become more segmented from world capital markets. A large portion of the equity capital of emerging economies is held by local investors who are likely to evaluate their portfolios in light of local economic and market conditions.[3] Therefore, the relative segmentation of emerging markets provides a unique opportunity to examine cross-sectional variation of stock returns: if the return factors found in a group of relatively isolated markets are the same as in developed markets, it becomes more likely that these factors are fundamentally related to the way in which investors set prices in financial markets around the world.

Market segmentation and low correlations *across* emerging market countries do not preclude structure to the individual stock returns *within* these markets. For example, suppose that emerging markets are effectively segmented from world markets, and that a domestic version of the Capital Asset Pricing Model (CAPM) holds in each country. Under these conditions high beta stocks are expected to outperform low beta stocks in each country, as long as betas are measured relative to the appropriate local market portfolios. Therefore, one expects to find similar risk exposures driving expected stock returns in segmented and integrated markets, with the qualification that if markets are segmented the risk exposures are measured relative to local

[3]See Bekaert and Harvey (1997b), Campollo-Palmer (1997) for a summary of foreign ownership in emerging equity markets.

benchmarks, and the prices of risk are determined locally rather than in global markets.

The paper attempts to answer two sets of questions. The first set of three concerns the existence of return premiums: (i) Do the factors that explain expected return differences in developed equity markets also describe the cross-section of expected returns of emerging market firms? (ii) Are the return factors in emerging markets primarily local or do they have global components as well? (iii) How does the emerging market evidence contribute to the international evidence from developed markets that the similar return factors are present in markets around the world?

The second set of questions relates to the interpretation of the return factors. Daniel and Titman (1997) argue that the return premiums in the U.S. are related to firm characteristics, rejecting the linear multi-factor interpretation of Fama and French (1996). One firm characteristic that is of particular concern to investors in emerging markets is liquidity. For example, if growth stocks are on average more liquid that value stocks, the value premium may in part reflect a compensation for the lower liquidity of value firms. This motivates the final two questions of the paper: (iv) Is there a cross-sectional relationship between liquidity and average returns in emerging markets? (v) Are the return factors in emerging markets cross-sectionally correlated with liquidity?

Little is known about the answers to these questions, as few papers have studied individual stock returns in emerging markets. There is some conflicting evidence on the first question: Fama and French (1998) document a premium for small firms and value stocks in 17 emerging market countries, while Claessens, Dasgupta, and Glen (1995) report a premium for large firms and growth stocks in an earlier sample of 19 emerging markets, in addition to a premium for beta and share turnover. Harvey (1995) and Harvey and Bekaert (1995,1997a) have studied the influence of local and global factors on expected returns and volatility in emerging

markets (question (ii)), but these studies have been conducted at the aggregate country level, whereas this paper is concerned with the cross-section of individual stock returns in countries.

The findings can be summarized as follows. In a sample of 1705 firms from 20 emerging markets, taken from the Emerging Markets Database (EMDB) of the International Finance Corporation (IFC), I find that the return factors in emerging markets are qualitatively similar to those documented for many developed markets. The combination of a small number of stocks in some countries and the high volatility of returns often precludes precise measurement of return premiums in individual countries, but averaged across all emerging markets stocks exhibit momentum, small stocks outperform large stocks, and value stocks outperform growth stocks. There is no evidence that high beta stocks also outperform low beta stocks, nor do I find that average returns are related to liquidity, as measured by share turnover. The results for value and size confirm findings by Fama and French (1998), but differ from Claessens, Dasgupta, and Glen (1995).

Two empirical observations suggest that the return factors of emerging markets have a strong local character: their correlation across emerging markets is on average low, and the exposure to global risk factors cannot explain their average returns. There is no evidence that the factor correlations are higher among countries within particular geographical regions such as Latin America, Asia, or Europe/Africa/Middle-East. And although the co-movement between emerging market country returns may have increased over time (Bekaert and Harvey (1997)), I find little evidence that this is also true for the factors that drive individual stock returns within these markets. A Bayesian analysis of the return premiums shows that, unless one has strong prior beliefs to the contrary, the posterior odds after observing the combined evidence from both developed and emerging markets strongly favor that value and momentum, and to a lesser extent size are compensated for in average stock returns around the world.

Although share turnover cannot explain differences in average returns in emerging markets, there are strong cross-sectional share turnover patterns in the local return factor portfolios. Stocks with high beta, small market cap, high past medium-term return, or high book-to-market have higher average turnover than stocks with low beta, large market cap, poor past performance, or low book-to-market. This seems at odds with a simple liquidity explanation for the return premiums.

The remainder of the paper is organized as follows. Section 2 gives a description of the data. The third section presents the average returns and correlation of the local return portfolios. The evidence of the relationship between returns and turnover is presented in section 4. The final section gives a summary of the conclusions and provides directions for future research.

2. Sample description

As of April 1997 the Emerging Markets Database (EMDB) of the IFC contains data on over 2200 firms from 31 emerging markets, but not all are included in the sample. Eleven countries are excluded because of insufficient return histories, which leaves 1705 firms in the 20 countries that the IFC tracks for at least 7 years. For some firms monthly closing prices and dividends are available dating back to 1975. Starting at various points during the 1980's the EMDB expanded its reporting to include monthly time series for price-to-book ratios, price-earnings ratios, market capitalization, trading volume, and the number of days in a month that a stock is traded. It is important to note that the EMDB does not represent a random sample of emerging markets firms. There are two main sources of bias. First, IFC uses several criteria to select stocks for its global indices. In order of importance these are: trading activity in terms of value of shares traded during a review period, total market capitalization coverage, and industry diversification. The EMDB is therefore biased towards larger and more frequently traded issues. Second, in mid-1981

when the IFC started constructing indices for 10 emerging markets, it collected available return information back to 1975, which introduces a survivorship bias into the pre-1982 returns. For this reason firms are included in this study only after their respective countries enter the IFC database, which has the effect of excluding the backfilled returns[4].

In addition to survivorship and stock selection bias there are several other data issues to confront. First, there are occasional "gaps" in the time series of firm characteristics used to form portfolios such as book-to-market or price-to-earnings. A firm is excluded from a characteristic portfolio if the relevant ranking information is missing in a particular month, but remains in the sample otherwise. Second, there are what appear to be data errors. These vary from zero entries in case of insufficient significant digits to a computed total firm return that exceeds 100,000 percent per month. In light of the high volatility of emerging markets firms and lacking an independent data source, it is difficult to reliably identify outliers. Therefore I choose to report results based on all available observations but at times report medians instead of means.

Total returns are calculated as the sum of dividend return plus price appreciation, using prices scaled by a "capital adjustment factor," which the IFC computes to correct for price effects associated with stock splits, stock dividends, and rights issues. Many emerging markets have firms with multiple classes of shares carrying different ownership restrictions. Firms with multiple share classes are treated as a single value-weighted portfolio of its outstanding equity securities.

Table 1 presents some summary statistics for the resulting sample. The first columns confirm one of the well-known facts about emerging markets: average returns have historically been high relative to most developed markets, both in local currency and in U.S. dollars.

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[4]Backfilled returns are used to get preliminary estimates of momentum and beta that are used to rank stocks in the first month that a country enters the sample.

Measured in U.S. dollars average returns range from 0.17 percent in Jordan to 5.30 percent per month in Argentina, and average returns exceed two percent per month in eleven of the 20 sample countries. Emerging markets have also been more volatile than developed markets. Argentina has a standard deviation of almost 30 percent and is one of eight countries for which the historical standard deviation exceeds 10 percent per month. Goetzmann and Jorion (1996) argue that the survival of emerging markets can induce a positive correlation between ex-post average returns and volatility. This survivorship bias may in part explain the high ex-post correlation of 0.90 between the mean and standard deviation of the country returns measured in U.S. dollars.

The next columns shows that there is considerable cross-sectional variation in median firm size, book-to-market, (B/M), earnings to price (E/P) ratios, and trading intensity across markets[5]. Median firm size measured as the natural logarithm of the market value of equity in U.S. dollars varies from 2.81 in Zimbabwe to 6.14 in Taiwan, which means that the median firm in Taiwan is almost thirty times larger than the median firm in Zimbabwe. Median B/M ratios range from 0.35 in Turkey and Taiwan to 1.62 in Brazil. Between 1982 and 1997, the median E/P ratio was 3.85 percent in Brazil, substantially below Zimbabwe where the median E/P ratio during that period was 20.07 percent. The final two columns report liquidity measures for the sample stocks. Liquidity measured by the number of days traded per month is fairly uniform across countries and exceeds fifteen in all countries except for one. The monthly share turnover ratios show considerably more dispersion across markets. With a median monthly turnover ratio of 0.04 percent, Nigeria is one of six countries with turnover ratios below one percent. By

[5] The distribution of these firm characteristics is skewed, and especially the ratios are sensitive to outliers. For these reasons, I compute monthly medians across firms in a country and report the time series average of these monthly medians. The conclusions are qualitatively unchanged for “trimmed” means that exclude 5 percent of the observations in each month.

contrast Korea and Taiwan have monthly share turnover ratios of 8.13 and 30.22 percent respectively, and median ratio has regularly exceeded 100% per month in Taiwan. The next section describes the cross-sectional relation between these characteristics and average returns by emerging market.

3. Local return factor portfolios.

It is standard practice in empirical finance to study return premiums by comparing the returns of portfolios that are formed by sorting stocks on observable firm characteristics or estimated risk exposures[6]. We rank stocks by country on local beta, size, prior six-month return, book-to-market, earnings-to-price, and turnover. At the beginning of each month, stocks for which the relevant ranking information is available are grouped by country into three portfolios (top 30, middle 40, and bottom 30 percent). The portfolios are equally-weighted and rebalanced every month. Unless stated otherwise, the conclusions are unaffected by the equal-weighting of the factor portfolios. Throughout the paper I report the full sample post-ranking returns of the top and bottom portfolios, expressed in U.S. dollars. Choosing the U.S. dollar as a numeraire serves to make the portfolio returns comparable across countries, but does not affect the excess returns of top minus bottom portfolios within countries because these excess returns correspond to investment strategies that take simultaneous long and short positions and therefore no net position in any country or currency.

3.1 Local beta and size.

[6]An alternative methodology is to run Fama-McBeth (1973) monthly cross-sectional regressions to examine return premiums. While these regression slope coefficients sometimes have the interpretation of portfolio excess returns, they do not constrain the portfolio weights to be positive. Because short selling is a serious problem in emerging markets, I choose to compare the return of equally-weighted portfolios.

For each stock a monthly pre-ranking local beta is estimated by regressing its local currency return on the IFC global index return of the country to which the firm belongs. One lag of the index return is included to allow for a delayed response due to non-synchronous trading. A minimum of two years and up to five years of historical returns prior to the time of ranking are used to obtain pre-ranking betas. The choice of benchmark merits some discussion. Because the primary focus of the paper is on local factors, and not market integration, the IFC global country indices are used instead of the narrower IFC investable country indices, or a global index that includes developed markets. Harvey (1995) has shown that the correlations between emerging country returns and the global market are close to zero, and it seems unlikely that global beta is informative about the cross-section of expected returns. In Section 3.4 I examine the extent to which these local beta portfolios share a common component with global factors.

The left half of Table 2 summarizes the average post-ranking returns of the beta-sorted portfolios by country. There is no clear relation between average returns and pre-ranking local betas in emerging markets. In about half of the countries the high beta portfolio outperforms the portfolio of low beta stocks, but the excess return is never significantly different from zero. The last two lines of Table 2 show that the difference between the returns of beta-sorted portfolios that are diversified across all 20 emerging markets is not significantly different from zero, both in the case where stocks are equally-weighted and where countries are equally-weighted.

The high volatility of emerging market returns raises two concerns about the power to detect differences in average returns. First, the pre-ranking betas may be poorly estimated, and what is designed as a sort on beta is effectively a sort on estimation error that is uncorrelated with post-ranking average returns. The next two columns of table 2, which give the full-sample post-ranking betas, show that is not the case. The post-ranking beta of the high beta-portfolios exceeds the beta of the low-beta portfolios in 18 of the 20 countries, and in 13 countries by more than two

standard errors. The second concern is that it may be difficult to accurately estimate average returns over relatively short time intervals. However, the *t*-test applies to the return *difference* between two portfolios which are strongly positively correlated. The sample correlations between the two beta-sorted portfolios range from 0.44 to 0.94 across countries. As a consequence of diversification the sample correlation between the two internationally diversified beta portfolios exceeds 0.90, and the standard error of the average excess return of −3 basis points (bp) is only 18 bp per month. This is small in absolute terms, but needs to be put in perspective against the difference between the post-ranking betas, which averages 0.22 across countries. Suppose that a local version of the CAPM holds in each country and that the true risk premium for beta averages 12 per cent per annum across markets, or 100 bp per month. The expected excess return of two portfolios that differ in beta by 0.22 is 100×0.22=22 bp per month, which is only about one standard error from the sample average premium. The conclusion is therefore that while there is no evidence that local beta risk has received compensation in average returns, the power of the test is probably low due to difficulties achieving sufficient spread in the post-ranking betas.[7]

The last columns of Table 2 give the returns on size-sorted portfolios. Although the size premium is only significant in a few individual countries, an internationally diversified portfolio of small stocks has significantly outperformed a portfolio of large stocks by about 70 basis points per year (t=3.09), irrespective of whether securities or countries are equally-weighted. The reason is that the average correlation between the S−B portfolios across countries is only 0.01, which means that much of the country-specific excess return variance is diversified internationally. Yet, the strong performance of small stocks has not been uniform: out of the five countries with the

[7]It is conceivable that a larger spread on beta can be obtained by constructing the beta-sorted portfolios from only the extreme pre-ranking beta deciles. Because these portfolios have fewer securities, they are not as well diversified and the power of the means test is attenuated by a larger standard error of the average excess return.

largest size returns four are from Latin America, and only in twelve of the twenty sample countries have size returns been positive. A non-parametric Wilcoxon Signed Rank Test (SRT) on the twenty S and B average returns does not reject equal performance of small and big firms at the 10% level. Unreported results show that the performance of small stocks cannot be attributed to a negative correlation between beta and size. Fourteen of the twenty country-specific S–B portfolios have a negative beta with respect to their respective Global IFC indices.

The low cross-country correlation between size sorted portfolios in emerging markets is similar to the international evidence for developed markets reported in Heston et. al.(1995). They conjecture that if most of the variance in size returns can be diversified internationally, the size premium is perhaps a reward for the lower liquidity of small stocks. Although a direct measure of liquidity, such as the bid-ask spread, is not available in the EMDB, the database provides information on share turnover. As will be shown in Section 4, the median turnover of the stocks in portfolio S is higher than in B. This is not to be interpreted that high turnover is associated with high return in emerging markets, because it is a consequence of the sample selection criteria used by the IFC. The interesting finding rather is that even among stocks that are screened based on the total value of trading volume, small stocks earn a return premium over large stocks in emerging markets. This seems to be at odds with a simple liquidity premium explanation for the size returns.

3.2 Momentum.

Momentum or relative strength portfolios are formed by ranking stocks in each country on past six-month return. As shown in Jegadeesh and Titman (1993) and Rouwenhorst (1998) for developed markets, momentum returns accrue gradually over a period of up to one year after ranking. Contrary to the beta- or size-sorted portfolios, it is important to select a holding period

that is longer than one-month. For ease of comparison with earlier papers a holding period of six months is chosen. And similar to Jegadeesh and Titman (1993), I report the monthly average return across six strategies each starting one month apart to handle the issue of overlapping observations in using a six month holding period. To attenuate the effect of bid-ask bounce the portfolios are formed one month after the ranking period. The positions initially weight stocks equally and positions are not rebalanced during the holding period. Return outliers are potentially a problem in the formation of momentum portfolios, because these strategies select stocks based on extreme performance. For this reason I exclude at each ranking date the extreme 5% of the prior six month return distribution in the formation of the portfolios.[8]

The first columns of Table 3 show that past Winners (W) outperform Losers (L) on average in 17 out of 20 countries (Wilcoxon SRT *p*-value < 1%), and the average W−L excess return is more than two standard errors away from zero in six countries. Implemented simultaneously across all 20 emerging markets, the W−L strategy returns on average 0.39 percent per month (*t*=2.35) if stocks are equally weighted. Equally-weighting countries gives an average W−L excess return of 0.58 percent per month (*t*=3.78). The statistical significance of the returns to these internationally diversified momentum portfolios is again a result of the low pair-wise correlation between the momentum returns, which averages −0.007 across the twenty emerging markets and never exceeds 0.25 for individual country pairs.

At first glance, the emerging markets average momentum returns are lower than the average for developed markets reported by Jegadeesh and Titman (1993) and Rouwenhorst (1998).[9] However, the W and L portfolios in these studies contain only stocks from the top and

[8]The results are qualitatively similar, although slightly weaker, if these extreme observations are included.

[9] Jegadeesh and Titman (1990) report an average excess return of about one percent per month in the U.S., and Rouwenhorst (1998) documents a similar return for a diversified

bottom 10 percent of the prior return distribution, while the emerging markets momentum portfolios include stocks from the top and bottom 30 percent. Since the evidence for developed markets indicates that the strength of return continuation increases with past return, the coarser sort attenuates the documented momentum effect for emerging markets.

3.3 Value and growth.

The remaining columns of Table 3 report the average returns for portfolios ranked on book-to-market (B/M) and earnings-to-price (E/P). The stocks of firms with low B/M and E/P are commonly referred to as growth stocks, as opposed to value stocks which sell at high B/M and E/P multiples. The Table shows that high B/M stocks have outperformed low B/M stocks in 16 of 20 countries, while high E/P stocks outperform low E/P stocks in 17 of 20 countries (Wilcoxon SRT *p*-values < 1%). Although the return differences are not always significant for individual countries, the average excess return of an internationally diversified high minus low B/M excess return is 0.72 percent per month (*t*=3.82) if stocks are weighted equally, or 0.93 percent per month (*t*=4.00) if countries are weighted equally. E/P portfolios that are diversified across all 20 emerging markets give a similar estimate of the value premium. The average excess return of High E/P minus Low E/P portfolios is 0.60 percent per month with a standard error of 0.13 percent (*t*=4.46).

The excess returns of equally-weighted B/M and E/P portfolio translate respectively to estimated value premiums of 9.00 and 7.44 percent per annum. These values are close to the historical averages of 7.60 and 6.80 percent which Fama and French (1998) report for developed markets between 1974 and 1995, but are somewhat lower than their emerging markets evidence. They document value premiums of 16.91 (*t*=3.06) and 4.04 percent per annum (*t*=0.58)

European portfolio.

respectively for B/M and E/P portfolios that are value-weighted and diversified across 17 emerging markets between 1987 and 1995. The stronger statistical significance of our E/P results can perhaps be explained by the fact that Fama and French rank stocks annually as compared to monthly in this study. Because earnings are more volatile than book values, more frequent rebalancing affects the E/P returns more than the B/M portfolios.

3.4 Emerging market return factors: Local or global risks?

The previous section has shown that on average across emerging markets small stocks outperform large stocks, past medium-term winners outperform medium-term losers, and value stocks outperform growth stocks. Are these return factors predominantly local, or do they have common regional or global components as well? Panel A of Table 4 examines the return factor correlations among emerging markets and within geographical regions, while panel B presents the sensitivity of the internationally diversified emerging markets return factors to a set of global risk factors. The first entry in Panel A shows that the pair-wise correlation between the excess returns of the twenty beta-sorted portfolios averages 0.02 across all markets. The remainder of the first column shows a similarly low average correlation for the other return factors. The next columns show that the correlations are not appreciably higher among members of the regional IFC indices. Even between the geographically concentrated emerging markets of Latin American the average sample correlation between return factors never exceeds 0.03. And the average correlation between the E/P factor portfolios is actually negative in each of the three regions. The right hand size of Panel A gives the average sample correlations for the last five years of the sample. During this period most emerging markets had relaxed barriers to cross-border investment (Bekaert and Harvey (1997b), which can lead to an increase in the correlations between country market returns (Bekaert and Harvey (1997a)). This is illustrated by comparing

the last lines of each panel which gives the average correlations between the global IFC country index returns. The average estimated correlation between Global IFC country returns is 0.18 over the last five years, compared to the full sample correlation of 0.10. However, there is no clear increase in the correlation between the local return factors. This suggests that the factors that influence country performance are distinct from those that drive expected return differences within markets. In conclusion, the correlation evidence suggests that the cross-sectional differences between expected returns are primarily driven by local factors.

The easiest way to assess the influence of global components would be to run a multiple regression of the local return factors on their global counterparts. However, global momentum, and size returns are not readily available. Panel B gives the coefficients of a simpler regression that includes the excess returns of the global market and the book-to-market portfolio of Fama and French (1998) as independent variables[10]. Over the full sample, about half of the estimated global exposures are negative, and none of the factor portfolios have significantly positive loadings on the global risk factors. As a consequence, it is not surprising that the global risk factors are unable to explain the mean returns of the emerging markets return factors. With the exception of the momentum factor, the intercepts of the regressions are close to the raw excess return reported in Tables 2 and 3.[11] Over the last five years of the sample, the intercepts are insignificant for momentum and size, not because of increased explanatory power of the global risk factors, but because the raw momentum and size premiums are lower during this period. The combined evidence from the correlations and the exposure regressions provides further evidence

[10] I thank Ken French for making these data available, in addition to the time series for S−B and value-growth portfolios for the United States and international markets outside the U.S., which will be used in section 3.5. A detailed description of the methodology used to construct these series can be found in Fama and French (1996,1998).

[11]Adding the S−B and W−L excess returns from the U.S. as regressors does not affect the results.

that during much of the sample period emerging markets have been isolated from world markets.

3.5 A Bayesian interpretation of return premiums around the world.

Table 5 summarizes the average emerging markets premiums and their counterparts from the U.S. and other developed markets reported in a sample of the previous literature[12]. The fact that qualitatively similar factors play a role both in financially integrated markets and countries with segmented capital markets makes it more likely that the premiums are fundamentally related to the way in which financial markets set prices. However, the *t*-statistics in Tables 5 do not indicate how much weight each individual may place on the emerging markets evidence. This will depend on their prior beliefs about the distribution of the return premiums before examining the data.

For example, based on the literature on weak form market efficiency of equity markets, an individual may have prior beliefs that momentum strategies, which trade stocks based on their most recent six-month price history, are equally likely to return positive or negative profits. At the same time, this person may not have strong beliefs about the relative performance of value and growth stocks. In this situation, the reported sample value premiums may influence the beliefs of this individual more than the international evidence on momentum investing, despite the comparable "statistical significance" of momentum and value premiums.

Bayes' rule provides a natural framework to analyze how the combination of prior beliefs and information obtained by sampling the data influences individual beliefs. If an individual's prior belief about the mean return premium, μ, is given by the probability density function $P(\mu)$

[12] The book-to-market returns for the U.S. and international markets are from Fama and French (1998), as well as the time series for S−B. The S−B for Europe and W−L (momentum) returns for the U.S. and Europe are from Heston, Rouwenhorst and Wessels (1998) and Rouwenhorst (1998). They are constructed in the same way as the size and momentum returns in emerging markets.

and the likelihood of observing a sample premium $\bar{x}$ is $P(\bar{x}|\mu)$, Bayes' rule states that the probability density function that describes the posterior beliefs about the mean return premium after observing the data, $P(\mu|\bar{x})$, is proportional to $P(\bar{x}|\mu)P(\mu)$. Also, if two independent samples are observed consecutively, the posterior beliefs $P(\mu|\bar{x}_1, \bar{x}_2)$ are proportional to $P(\bar{x}_2|\mu)\ P(\bar{x}_1|\mu)\ P(\mu)$. Because $P(\bar{x}_1|\mu)\ P(\mu)$ is the posterior distribution of the first sample, Bayes' rule can be implemented sequentially, where the posterior distribution of the first sample becomes the prior distribution for the second sample. Assuming normal distributions for prior beliefs and the sample means, the distribution for the posterior mean will also be normal.[13]

A slight complication is that the estimated time series means from the United States, Europe, and emerging market countries are not independent. To account for the covariance between these regions, I update the prior beliefs using the sample time series means of three portfolios: the first contains U.S. stocks only, the second contains stock from both the U.S. and other developed markets, while the third in addition includes the emerging market firms. Regions are equally weighted. By examining the means of portfolios that combine regions, any covariance between the regional returns will be accounted for in the sample variance of the portfolio.[14]

Figures 1-3 summarize the posterior beliefs after examining the data for an individual whose prior belief is that mean return premiums for size, momentum and value are zero. The figures report the posterior odds ratio which is the ratio of the probability that the mean return premium is positive and the probability that the mean return premium is negative. The posterior

[13] With 15 to 30 years of monthly data available, the distribution of the sample means are likely to be close to a normal.

[14]To the extent that the portfolios combine time-series of different length, the portfolio return variance will be heteroskedastic, even if the regional returns are not. For this reason, a correction for heteroskedasticity is used to compute the standard error of the average portfolio return.

odds ratios are increasing in the standard deviation of the mean of the prior distribution: as an individual's prior beliefs become more diffuse, more weight will be placed on the information provided by the sample. Suppose an investor who is skeptical about the ability of past returns to predict future returns and, before examining the data, believes that the average excess return of momentum investing is not different from the excess return of two random portfolios with the same number of securities. To characterize his prior beliefs he takes the same eighteen years of monthly data from the United States that were used to compute the momentum returns in Table 5, and constructs two random portfolios. The difference between the average returns of these portfolios is close to zero with a standard error of 0.06 percent per month. Consecutively observing the evidence for the U.S., other developed markets, and emerging markets, Figure 2 shows that the skeptic would update his prior even odds to respectively 3.7, 17.8, and 267 to one that average returns to momentum strategies are positive. If the same distribution characterizes prior beliefs about size and value premiums, the empirical evidence gives posterior odds ratios of 2.3, 3.4 and 5.6 (size) and 6.5, 14.1 and 34.3 (value). In case of momentum and value, the emerging markets evidence influences the beliefs of this skeptic by more than doubling the odds that the return premium for value and momentum are positive. His posterior probabilities of a positive momentum and value premium exceed 95 percent. The posterior probability of a positive size premium exceeds 95 percent for investors whose prior standard deviation of the mean premium exceeds 0.12 per cent per month.

One of the motivations for examining international samples it to address the potential data-snooping bias in U.S. data. An investor who has prior beliefs that the true return premiums are zero, and that the reported premiums for the U.S. are the outcome of repeated data snooping, may entirely discard the U.S. evidence and only use data from international developed markets and emerging markets to update his priors. Unreported results show that if the standard deviation

of his prior beliefs about the mean exceeds 0.08 per cent per month, the posterior odds ratio after observing the international and emerging markets evidence will exceed twenty to one for each of the return premiums (size, momentum, and value). The conclusion is that unless investors have strong prior beliefs to the contrary the combined evidence from developed and emerging markets favors the hypothesis that size, momentum and value are compensated for in average returns around the world.

4. Share turnover and emerging market stock returns.

Despite the evidence that similar return factors are compensated for in average returns around the world, an important question remains unanswered: what is the (economic) interpretation of the premiums? Fama and French (1996) interpret the premiums as a rejection of the CAPM in favor of a linear multi-factor model of returns. By contrast, Daniel and Titman (1997) show that the premiums in the U.S. are not related to factors exposures, but instead to firm characteristics. One firm characteristic that is of particular interest to investors in emerging markets is liquidity, and work by Amihud and Mendelson (1986), Hu (1997), Chalmers and Kadlec (1998), and Datar, Naik and Radcliffe (1998) suggest that liquidity is compensated for in expected returns. If small stocks, past medium term winners, and value stocks are on average less liquid than big stocks, past medium term losers, and growth stocks, the reported premiums in emerging markets may simply be a compensation for their relative illiquidity.

To examine the potential confounding influence of liquidity, I study the cross-section of returns and share turnover. Two questions are of interest: is a difference in the average returns of turnover sorted portfolios? And if so, does this turnover premium contaminate the returns of the factor portfolios? The returns of turnover sorted portfolios are summarized in Table 6. Table 7 presents the turnover of the shares in the portfolios sorted on beta, size, momentum, and book-to-

market.

Table 6 shows that there is little difference between the average returns of portfolios formed by ranking stocks based on prior turnover. The return on high turnover portfolios exceeds the return on a portfolio of low turnover stocks in 12 of 20 countries, and the absolute value of the *t*-statistics for the equality of means exceeds 2 in only two countries, about what might be expected purely by chance. Averaged across all 20 markets, the excess return of high turnover stocks is insignificantly different from the return on low turnover stocks (t=0.72). These results are much weaker than the findings of Cleassens, Dasgupta and Glen (1995) who report a positive association between average returns and turnover in 17 of 19 markets in an earlier and shorter sample.

By contrast, there are strong turnover patterns associated with the local factor portfolios of emerging markets. Table 7 shows that in 15 of the 20 sample countries the average median turnover of small stocks is higher than the turnover of the large stocks. As pointed out previously in section 2, this is in part a consequence of the sample selection criteria of the IFC: for a small stock to clear the selection hurdle in terms of total value of shares traded, it has to have higher turnover than a large stock. However, size is not the only factor that is associated with average turnover. Average turnover is positively associated with beta in 19 of 20 countries, with value in 14 of 20 countries, and momentum in 16 of 20 countries[15]. The sample selection bias that leads to the negative cross-sectional correlation between size and turnover may indirectly be responsible for the turnover patterns in the other factor portfolios. For example, high B/M firms are on average smaller than low B/M firms in all twenty markets, and this size-bias likely contributes to the turnover differences between value and growth portfolios. However, size cannot explain the

[15]The results for beta- and size-sorted portfolios are consistent with the findings reported by Lo and Wang (1997), who find in a cross-section of U.S. firms that individual stock turnover is positively related to beta and residual standard deviation, and negatively related to firm size.

turnover of beta-sorted and momentum portfolios. The relationship between beta and turnover is particularly strong. This is despite the fact that high beta stocks are larger than low beta stocks in 14 of 20 markets, which may attenuate the positive turnover difference between beta-sorted portfolios. One reason may be that high beta stocks are on average more volatile, and more sensitive to portfolio re-balancing by investors.

At first glance, turnover variation of momentum portfolios is the weakest among the four factors. The average median turnover of the Losers is lower than the turnover of the stocks in the Winner portfolio in 18 out of 20 countries, and Winners on average turn over faster and Losers slower than their respective country medians. These patterns are somewhat surprising considering the average size and volatility of the momentum stocks. Unreported results show that past Losers are on average smaller than past Winners in all markets, yet Winners have higher turnover than Losers. Also, both Winners and Losers are more volatile than the average stock, because ranking on past return is correlated with volatility, yet the turnover of Losers is below the country average. Odean (1998) attributes low turnover of Losers to a disposition effect whereby investors are more reluctant to realize losses than take gains. Whether similar turnover patterns are associated with momentum strategies in developed markets is not known. If so, this data can potentially suggest an interesting dimension for distinguishing between various models that attempt to explain return continuation (Hong and Stein (1997), Daniel, Titman and Hirshleifer (1997), Berk, Green, and Naik (1998)).

The conclusion is that turnover is positively associated with the same attributes that explain cross-sectional differences in average returns. Absent a dynamic theory that links returns to trading activity, these patterns are difficult to explain. However, the empirical evidence suggests that common factors may drive the cross-section of returns and turnover, which provides an interesting challenge for theoretical models to explain. And a practical implication of

these findings is that portfolio managers who seek to increase their exposure to the return factors in emerging markets can do so without simultaneously increasing their positions in relatively illiquid securities.

5. Conclusion

This paper examines the cross-section of returns in twenty emerging markets using return data of 1750 individual stocks. The first conclusion is that the return factors in emerging markets are qualitatively similar to those in developed markets: small stocks outperform large stocks, value stocks outperform growth stocks and emerging markets stocks exhibit momentum. There is no evidence that local market betas are associated with average returns. The low correlation between the country return factors suggests that the premiums have a strong local character. In addition global exposures cannot explain the average factor returns of emerging markets. There is little evidence that the correlations between the local factor portfolios have increased, which suggests that the factors that are responsible for the increase of emerging market country correlations are separate from those that drive the differences between expected return within these markets. A Bayesian analysis of the return premiums in developed and emerging markets shows that, unless one has strong prior beliefs to the contrary, the empirical evidence favors the hypothesis that size momentum and value strategies are compensated for in expected returns around the world. Finally, the paper documents the relationship between expected returns and share turnover, and examines the turnover characteristics of the local return factor portfolios. There is no evidence of a relation between expected returns and turnover. However, beta, size, momentum, and value are positively cross-sectionally correlated with turnover in emerging markets. This suggests that the return premiums do not simply reflect a compensation for liquidity.

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Table 1: Summary statistics of emerging markets firms 1982:1-1997:4.

The table gives for each country the number of firms in the sample, the starting date for the return data, the average return and standard deviation of the return of the equally-weighted index of the sample firms, both in local currency (LC) and U.S. dollars (USD). Returns are expressed as percent per month between the starting date and April of 1997. The last five columns give summary statistics for median firm size, median book-to-market value (B/M), median earnings-to-price ratio (P/E), median monthly turnover, and median trading activity of the sample stocks in each country. The medians are computed by month across firms, and the table reports the time series average of these monthly medians. Size is measured as the log of the market value of equity in U.S. dollars. Turnover is computed as the number of shares traded in a month as a percentage of the number of outstanding shares at the beginning of the month. Days traded is expressed as the number of days that a stock trades in a month. Information on B/M, E/P, turnover and days traded is not available before 1987.

	Number	Starting	LC return		USD return		median	median	median	median	median
Country	of firms	date	mean	std	mean	std	size	B/M	E/P	turnover	days traded
Argentina	49	8201	16.50	42.92	5.30	29.82	4.08	1.58	3.85	3.00	20.58
Brazil	87	8201	19.35	26.67	4.27	20.17	4.97	1.62	6.50	1.82	20.28
Chile	59	8201	3.41	8.30	2.12	8.63	4.84	0.71	10.97	0.49	19.70
Colombia	34	8601	4.41	9.60	3.01	9.33	4.44	0.94	11.17	0.43	15.02
Greece	69	8201	2.24	9.71	1.40	9.91	4.02	0.51	7.72	1.51	20.25
Indonesia	114	9001	0.96	7.13	0.62	7.18	4.82	0.51	5.96	2.42	16.55
India	156	8201	1.92	9.50	1.14	9.04	4.76	0.40	5.70	1.88	18.09
Jordan	66	8201	0.56	4.57	0.17	4.78	3.30	0.67	6.34	1.79	18.29
Korea	179	8201	1.34	7.55	1.22	7.78	5.19	0.75	4.07	8.13	24.36
Malaysia	184	8601	1.63	9.15	1.60	9.06	5.64	0.43	3.10	1.89	20.59
Mexico	98	8201	6.00	12.93	3.05	13.86	5.17	0.90	8.32	2.74	18.75
Nigeria	38	8601	4.15	5.09	2.05	15.84	3.59	0.53	13.46	0.04	16.13
Pakistan	118	8601	1.74	7.00	1.05	7.05	2.97	0.51	8.91	0.44	15.22
Philippines	58	8601	3.17	10.83	2.92	10.69	4.51	0.45	6.04	1.78	20.50
Portugal	45	8901	0.77	6.14	0.63	6.74	4.93	0.72	6.17	1.34	18.89
Taiwan	119	8601	2.80	13.95	3.11	14.27	6.14	0.35	3.64	30.22	23.77
Thailand	120	8201	1.27	8.60	1.21	8.65	5.04	0.46	6.62	3.48	20.47
Turkey	64	8901	8.73	18.97	4.36	19.48	4.94	0.35	8.71	4.29	20.80
Venezuela	20	8601	5.43	12.35	2.98	13.62	4.76	0.61	9.48	0.84	17.06
Zimbabwe	28	8201	3.75	9.64	2.24	9.78	2.81	1.15	20.07	0.29	9.85

Table 2: Average returns of beta and size sorted portfolios.

At the beginning of each month all stocks with at least two years of return history are ranked by country based on historical beta into three groups: High (top 30 percent), Medium (middle 40 percent) and Low (bottom 30 percent). Pre-ranking betas are computed in local currency relative to the local IFC index, using two to five years of monthly historical returns. Columns 3-5 give the average return on equally-weighted portfolios of low (L) and high (H) beta stocks and the H−L excess return, measured in U.S. dollars and expressed in percent per month. The next two columns give the post-ranking betas of the H−L excess return the coefficient divided by their standard errors. The final columns give information for size sorted portfolios. At the beginning of each month all stocks with available ranking information are ranked by country into three groups based on market value of equity measured in U.S. Dollars: Big (top 30 percent), Medium (middle 40 percent) and Small (bottom 30 percent). Columns 3-6 report the average return on equally-weighted portfolios of small (S) and big (B) stocks, the average S−B excess return. t() is the mean divided by its standard error. The next two columns give the average H−L excess return. T-stat mean is the mean divided by its standard error., and t(.) is the regression coefficient divided by its standard error. All is the equally-weighted portfolio of stocks of all 20 markets. The cross-country average is an equally-weighted average of the twenty countries.

		Average returns beta portfolios				Post-ranking Betas		Average returns size portfolios				
Country	start	Low-β	High-β	H−L	t(H−L)	$\beta_H-\beta_L$	$t(\beta_H-\beta_L)$	start	Small	Big	S−B	t(S−B)
Argentina	8201	5.40	4.82	-0.58	-0.53	-0.10	-2.98	8201	7.30	3.47	3.84	2.40
Brazil	8201	3.44	3.56	0.12	0.13	0.08	1.89	8201	5.00	3.25	1.76	1.32
Chile	8201	2.65	2.41	-0.24	-0.39	0.06	0.71	8201	2.22	1.91	0.31	0.56
Colombia	8701	2.83	1.97	-0.86	-1.32	-0.11	-1.56	8601	2.60	3.29	-0.68	-0.80
Greece	8201	1.96	1.30	-0.66	-1.08	0.14	2.36	8201	1.42	1.38	0.04	0.07
Indonesia	9201	1.46	2.33	0.87	1.21	0.47	5.94	9001	0.22	0.69	-0.46	-0.77
India	8201	1.38	0.83	-0.56	-1.23	0.30	6.71	8201	0.89	1.24	-0.35	-0.85
Jordan	8201	-0.13	0.68	0.80	1.82	0.34	3.47	8201	0.02	0.35	-0.34	-0.88
Korea	8201	1.13	1.16	0.03	0.07	0.09	1.61	8201	1.39	1.07	0.32	0.58
Malaysia	8701	2.23	2.19	-0.04	-0.07	0.34	5.34	8601	1.84	1.42	0.43	0.64
Mexico	8201	2.81	3.29	0.47	0.52	0.39	5.58	8201	4.63	2.24	2.39	2.59
Nigeria	8701	4.34	1.87	-2.47	-1.53	0.23	0.67	8601	1.62	2.22	-0.59	-0.61
Pakistan	8701	1.32	0.96	-0.36	-0.76	0.28	4.99	8601	0.70	1.11	-0.42	-0.78
Philippines	8701	1.15	2.46	1.32	1.36	0.27	2.83	8601	3.56	3.33	0.23	0.27
Portugal	8901	-0.06	0.82	0.88	1.56	0.32	3.32	8901	0.34	1.08	-0.74	-1.44
Taiwan	8701	2.81	3.03	0.22	0.42	0.09	2.65	8601	3.57	2.90	0.68	0.85
Thailand	8201	1.05	1.30	0.26	0.34	0.55	6.66	8201	0.52	1.90	-1.39	-2.43
Turkey	8901	4.85	4.97	0.12	0.10	0.26	4.39	8901	4.84	4.12	0.72	0.63
Venezuela	8701	1.77	2.63	0.85	0.73	0.40	4.47	8601	3.85	2.48	1.37	1.49
Zimbabwe	8201	2.39	1.58	-0.81	-0.92	0.09	0.92	8201	3.28	1.42	1.85	1.97
All 20 markets		2.14	2.11	-0.03	-0.16				2.42	1.73	0.69	3.09
Cross-country average		2.22	2.15	−0.08	−0.40				2.60	1.90	0.70	3.09

Table 3 Average returns to momentum and value portfolios

Momentum portfolios are formed by ranking at the beginning of each month *t* all stocks with available ranking information by country based on prior six month return between month *t –7* and month *t –1*. After excluding the top and bottom 5 percent, stocks are assigned to three equally-weighted portfolios: Winners (top 30 percent), Average (middle 30 percent) and Losers (bottom 30 percent), positions are held for 6 months and not rebalanced during this interval. Columns 3-6 report the average return on the Loser (L) and Winner (W) portfolios, the average W–L excess return, and the t-statistic of the mean. Book-to-Market (B/M) and Earnings-to-Price (E/P) portfolios are constructed as follows: at the beginning of each month all stocks with available ranking information are ranked by country based on B/M or E/P into three groups: High (top 30 percent), Medium (middle 40 percent) and Low (bottom 30 percent). Columns 8-11 report the average return on equally-weighted portfolios of low (L) and high (H) B/M stocks, the average H–L excess return, and its t-statistic. Columns 12-15 give the corresponding information for the E/P portfolios. The reported returns are converted to U.S. dollars and expressed as percent per month. All is the equally-weighted portfolio of stocks from all 20 countries. markets. The cross-country average portfolio weights all countries equally.

	Average Returns Momentum Portfolios					Average Returns B/M Portfolios					Average Returns E/P Portfolios			
Country	Start	Losers	Winners	W–L	t(W–L)	start	Low	High	H–L	t(H–L)	High	Low	H–L	t(H–L)
Argentina	8201	5.51	4.72	-0.79	-0.92	8701	4.73	6.41	1.68	1.03	5.30	4.76	-0.54	-0.64
Brazil	8201	4.21	4.22	0.01	0.01	8701	2.46	6.40	3.94	2.45	2.05	2.92	0.87	0.93
Chile	8201	1.23	2.60	1.37	3.63	8801	2.10	3.17	1.07	1.91	1.79	3.14	1.34	2.86
Colombia	8601	1.90	3.99	2.09	3.36	8701	1.96	1.60	-0.36	-0.37	2.03	2.49	0.46	0.56
Greece	8201	0.59	2.35	1.76	3.98	8701	1.61	2.92	1.31	1.45	1.69	2.29	0.60	1.06
Indonesia	9101	0.65	0.41	-0.24	-0.63	9001	0.24	1.34	1.11	1.74	0.07	1.25	1.18	2.11
India	8201	0.84	1.35	0.51	1.97	8701	1.13	1.18	0.05	0.08	1.33	1.09	-0.24	-0.41
Jordan	8201	-0.35	0.90	1.25	3.67	8701	0.02	0.09	0.06	0.14	0.05	0.34	0.29	0.78
Korea	8201	1.32	1.34	0.03	0.07	8701	0.17	1.75	1.58	3.41	0.42	1.50	1.08	2.61
Malaysia	8601	1.52	1.66	0.14	0.40	8701	1.49	2.52	1.02	2.24	1.60	1.88	0.28	0.71
Mexico	8201	2.48	3.01	0.52	0.84	8701	2.47	3.86	1.39	1.53	1.95	3.58	1.64	1.96
Nigeria	8601	1.76	3.18	1.43	2.27	8701	2.71	2.96	0.25	0.22	1.91	3.87	1.96	1.75
Pakistan	8601	0.82	1.10	0.28	0.82	8701	1.12	1.07	-0.05	-0.09	1.14	1.17	0.03	0.09
Philippines	8601	2.69	2.85	0.16	0.28	8801	1.11	1.62	0.51	0.61	1.14	1.92	0.78	1.01
Portugal	8901	0.02	1.19	1.16	2.27	8901	0.97	0.37	-0.60	-0.98	0.51	0.31	-0.20	-0.49
Taiwan	8601	3.05	2.58	-0.47	-1.33	8701	2.72	3.73	1.01	1.20	2.98	3.23	0.26	0.46
Thailand	8201	0.93	1.63	0.70	1.44	8701	2.00	0.44	-1.56	-1.96	1.00	1.09	0.09	0.15
Turkey	8901	4.04	4.51	0.48	0.57	8901	3.41	6.27	2.86	1.87	1.98	6.83	4.85	4.49
Venezuela	8601	2.68	2.71	0.03	0.04	8701	2.27	3.54	1.27	0.98	1.33	4.77	3.44	3.24
Zimbabwe	8201	1.94	2.69	0.75	1.16	8701	1.48	3.80	2.31	2.16	1.69	3.43	1.74	1.73
All 20 markets		1.74	2.13	0.39	2.35		1.70	2.42	0.72	3.82	1.67	2.27	0.60	4.46
Cross-country average		1.86	2.44	0.58	3.78		1.90	2.83	0.93	4.00	1.68	2.67	1.00	6.55

Table 4: Correlation between Emerging Markets Factor Portfolios and Global Factor Exposures

Panel A gives the average cross-correlation between the local excess return factor portfolios of emerging markets. The first column gives the average cross-correlation for 20 markets. The next three columns give the average correlation by region: Latin America (Argentina, Brazil, Chile, Columbia, Mexico, and Venezuela), Asia (India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Taiwan, and Thailand), and EMEA (Europe/Middle East/Africa: Greece, Jordan, Nigeria, Portugal, Turkey, and Zimbabwe). Panel B of the table the results of regressing the factor portfolios that are diversified across 20 emerging markets on the global excess market return, $R_M - r_f$, and the global High minus Low Book-to-Market Portfolio (HML).

Panel A: correlation between emerging markets factor portfolios

		Full sample				1992.4-1997.4			
Portfolio		All Markets	Latin America	Asia	EMEA	All Markets	Latin America	Asia	EMEA
Beta		0.02	0.01	0.05	0.06	0.03	0.03	0.10	0.06
Size		0.01	0.03	0.02	0.02	0.01	0.06	0.06	0.03
Momentum		−0.01	−0.02	0.01	−0.05	0.01	0.05	0.01	−0.09
Value	B/M	0.01	0.00	−0.01	0.06	0.04	0.07	−0.01	0.13
	E/P	−0.01	−0.01	−0.02	−0.02	−0.01	0.04	0.00	−0.01
Global IFC Indices		0.10	0.04	0.20	0.08	0.18	0.19	0.32	0.12

Panel B: factor exposures to global risk factors

$$R_{i,t} - r_{f,t} = a + b\,[R_{M,t} - r_{f,t}] + c\,HML_t + e_{i,t}$$

		Full sample							1991-1995						
		a	t(a)	b	t(b)	c	t(c)	R-sq	a	t(a)	b	t(b)	c	t(c)	R-sq
Beta		−0.15	-0.73	0.08	1.57	0.16	1.61	0.02	−0.31	−1.17	0.08	0.94	0.45	3.37	0.18
Size		0.86	3.41	-0.06	-0.98	0.08	0.66	0.08	0.26	0.83	−0.33	−3.41	0.12	0.77	0.19
Momentum		0.36	1.92	0.05	1.05	−0.10	−1.13	0.04	0.24	1.52	0.08	1.59	−0.21	−2.61	0.17
Value	B/M	0.91	4.37	-0.06	-1.28	0.11	1.11	0.19	0.98	3.45	−0.07	−0.84	0.02	0.16	0.19
	E/P	0.77	5.05	−0.00	-0.13	−0.04	−0.56	0.20	0.64	3.40	−0.06	−1.04	−0.10	−1.02	0.18

Table 5: Return premiums around the world.

The table summarizes a sample of international evidence on return premiums around the world. The U.S. return premiums for size and book-to-market (B/M) represent the excess return of small over large stocks (SMB) and the excess return of high over low B/M stocks (HML) from Fama and French (1996) updated through 1997. U.S. and European momentum returns are from Rouwenhorst (1998). They are calculated as the excess return of a portfolio of stocks with highest prior 6-month return (Winners) and a portfolio containing the stocks with lowest prior 6-month performance (Losers). Winners and Loser portfolios contain the top and bottom three deciles of the prior 6-month return distribution. The International B/M return premium is the excess return of an international portfolio of high (B/M) stocks from 12 developed markets outside the U.S. and a portfolio of low B/M stocks from those same countries, as reported in Fama and French (1998). The size premium for Europe is the excess return of small and large stocks, averaged across 12 countries in Europe, reported in Heston, Rouwenhorst, and Wessels (1998). The emerging markets premiums represent the average across 20 emerging markets. The table gives for each sample the average return and the *t*-statistic of the sample mean. The bracketed *t*-statistics are computed as the average difference between the return premium in the U.S. or International/Europe and the premium in emerging markets (during the period that the samples overlap), divided by the standard error of the difference.

		U.S.		International[a] /Europe[b]			Emerging Markets		
Premium	Period	Mean	*t*-stat	Period	Mean	*t*-stat	Period	Mean	*t*-stat
Size	63:7-97	0.23	1.62 [2.96]	79-95	0.29[b]	3.67 [2.36]	82-97:4	0.70	3.09
Momentum	80-95	0.64	3.02 [-0.31]	80-95	0.67[b]	6.33 [-0.65]	82-97:4	0.58	3.78
Book-to-Market	63:7-97	0.41	3.28 [2.70]	75-95	0.50[a]	3.13 [1.47]	87-97:4	0.93	4.00

Table 6: Average Returns of Turnover Portfolios.

At the beginning of each month all stocks with available ranking information are ranked by country into three groups based on share turnover: High (top 30 percent), Medium (middle 40 percent) and Low (bottom 30 percent). Columns 3-6 report the average return on equally-weighted portfolios of High (H) and Low (L) turnover stocks, the average H−L excess return. t() is the mean divided by its standard error. Turnover of the size-sorted portfolios, measured as the number of shares traded as a percentage of the total number of shares outstanding at the beginning of the month.

Average Returns

Country	start date	Low	High	H−L	t(H−L)
Argentina	8701	7.21	5.20	-2.01	-0.90
Brazil	8701	3.91	2.85	-1.07	-0.97
Chile	8701	2.86	2.84	-0.02	-0.04
Colombia	8701	2.00	2.71	0.71	0.90
Greece	8701	1.65	2.80	1.14	1.45
Indonesia	9001	-0.38	1.46	1.84	3.88
India	8701	0.75	1.45	0.70	1.15
Jordan	8701	0.27	0.47	0.20	0.34
Korea	8701	0.97	1.08	0.11	0.19
Malaysia	8701	1.54	1.86	0.32	0.50
Mexico	8701	3.17	2.83	-0.35	-0.48
Nigeria	8701	3.16	1.74	-1.43	-2.08
Pakistan	8701	1.51	1.00	-0.50	-1.12
Philippines	8801	1.36	1.35	-0.01	-0.01
Portugal	8901	0.14	0.91	0.76	1.52
Taiwan	8701	2.90	2.87	-0.03	-0.04
Thailand	8701	0.63	1.26	0.62	0.91
Turkey	8901	3.62	4.77	1.15	0.92
Venezuela	8701	3.01	3.77	0.75	0.64
Zimbabwe	8701	1.97	3.02	1.06	1.12
All 20 markets	8701	1.97	2.11	0.14	0.72

Table 7: Monthly turnover of individual stocks in local factor portfolios

The tables summarizes the median turnover of individual stocks, averaged over time, of country-factor portfolios that are formed by sorting stocks on local beta, size (market value of equity), momentum (past 6-month return) and book-to-market. For each country-factor portfolio the median turnover is computed by month. The table reports the time-series average of these monthly medians, and the average difference between medians by category. t() is the average divided by its standard error (corrected for autocorrelation). Turnover is measured as the number of shares traded during a month expressed as a percentage of the total number of shares outstanding at the beginning of that month.

			Beta			Size			Momentum			Book-to Market		
Country	Start	Full	Low	High	t(H−L)	Small	Big	t(S−B)	Losers	Winners	t(W−L)	Low	High	t(H−L)
Argentina	8701	3.00	2.64	3.01	1.42	2.40	2.81	-1.52	3.61	2.85	-2.29	2.91	4.29	4.19
Brazil	8701	1.82	1.16	2.38	9.20	2.73	1.17	5.67	2.25	1.69	-1.87	1.26	2.52	6.80
Chile	8701	0.49	0.41	0.71	3.96	0.51	0.63	-2.34	0.45	0.56	2.01	0.59	0.60	0.12
Colombia	8701	0.43	0.53	0.45	-2.31	0.53	0.48	0.77	0.42	0.49	1.96	0.38	0.48	2.49
Greece	8701	1.51	1.40	1.56	0.70	2.28	1.44	3.45	1.40	1.61	1.76	1.90	1.49	-3.15
Indonesia	9001	2.42	2.07	3.05	4.97	2.77	2.16	2.15	2.51	2.11	-3.17	2.13	3.18	4.54
India	8701	1.88	2.27	2.94	1.96	2.48	2.12	1.25	2.00	2.34	1.68	1.59	2.45	3.21
Jordan	8701	1.79	1.18	1.91	2.30	4.82	0.86	4.20	1.26	2.50	2.69	4.16	1.07	-4.08
Korea	8701	8.13	6.99	8.67	2.82	13.09	6.39	5.40	7.70	8.77	1.46	8.54	8.06	-1.28
Malaysia	8701	1.89	0.87	3.28	6.80	4.79	0.92	5.93	2.06	1.83	-0.64	1.76	2.45	1.69
Mexico	8701	2.74	1.77	4.05	6.35	2.01	3.42	-6.12	2.53	3.29	3.28	3.24	2.38	-2.74
Nigeria	8701	0.04	0.05	0.05	-0.60	0.04	0.05	-1.69	0.04	0.04	0.78	0.04	0.04	-1.62
Pakistan	8701	0.44	0.25	0.62	7.71	0.53	0.47	0.65	0.45	0.47	0.43	0.04	0.04	-1.62
Philippines	8801	1.78	1.35	3.64	4.14	3.30	1.44	4.04	1.76	1.92	0.53	0.37	0.52	2.59
Portugal	8901	1.34	1.37	1.69	3.02	1.38	1.46	-0.75	1.21	1.60	2.84	1.55	1.45	-0.94
Taiwan	8701	30.22	22.20	38.18	4.29	53.39	12.16	7.41	28.94	32.47	0.78	23.86	37.16	4.39
Thailand	8701	3.48	2.66	4.76	3.47	5.20	2.81	2.23	3.19	3.77	1.58	3.09	3.94	1.49
Turkey	8901	4.29	4.42	4.57	0.24	11.58	2.69	6.53	3.86	5.04	1.69	4.18	8.16	2.51
Venezuela	8701	0.84	0.67	1.83	2.84	1.57	1.42	0.28	0.89	1.21	0.98	0.95	1.37	1.48
Zimbabwe	8701	0.29	0.26	0.34	2.27	0.54	0.22	3.92	0.31	0.35	0.86	0.25	0.57	3.30
All		1.74	1.10	2.14	12.46	2.30	1.40	9.41	1.62	1.78	2.38	1.62	1.89	5.89

Figure 1: Posterior odds ratio of positive size premium
prior: mean return = 0

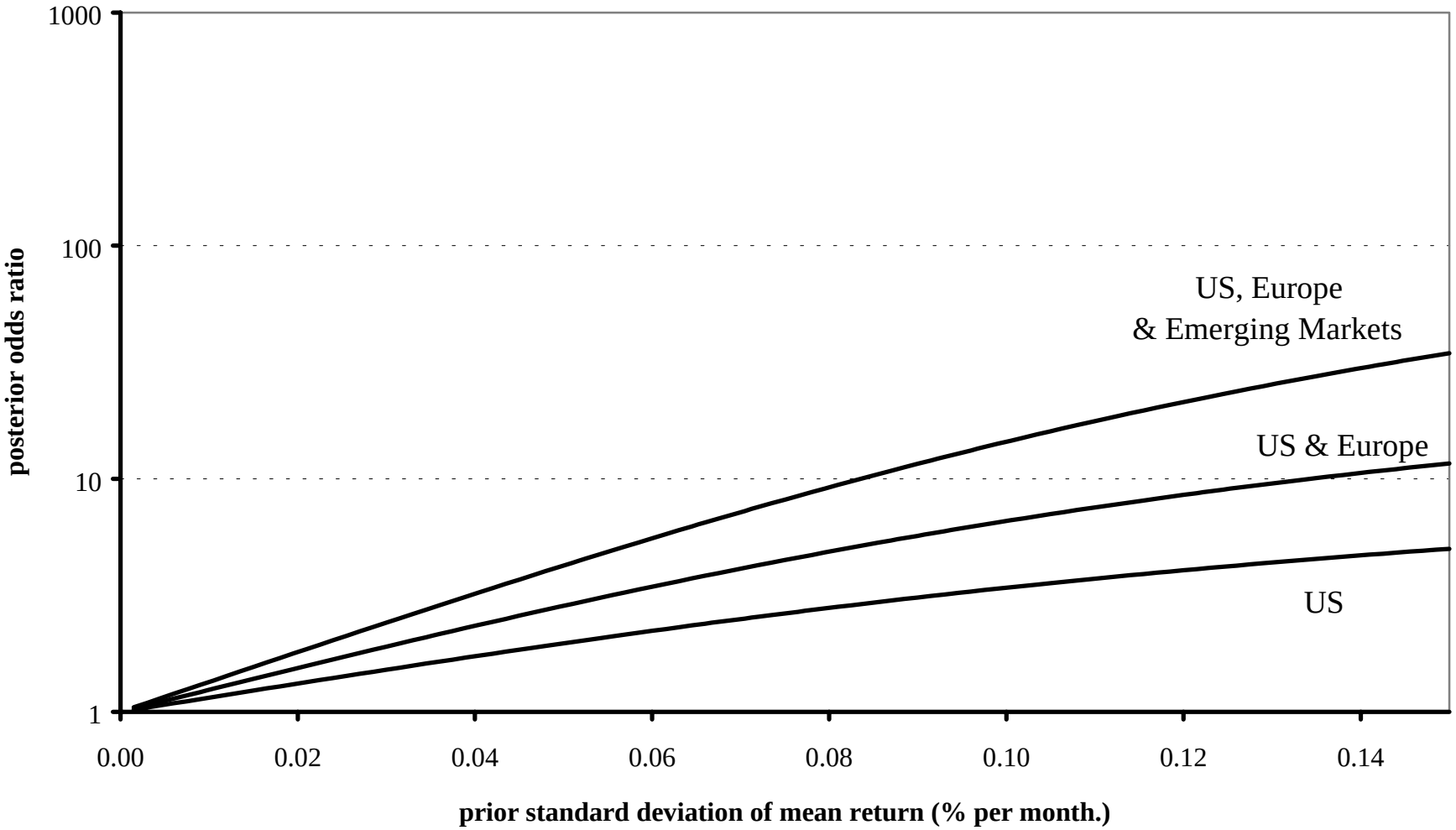

Figure 2: Posterior odds ratio of positive momentum premium
prior: mean return = 0

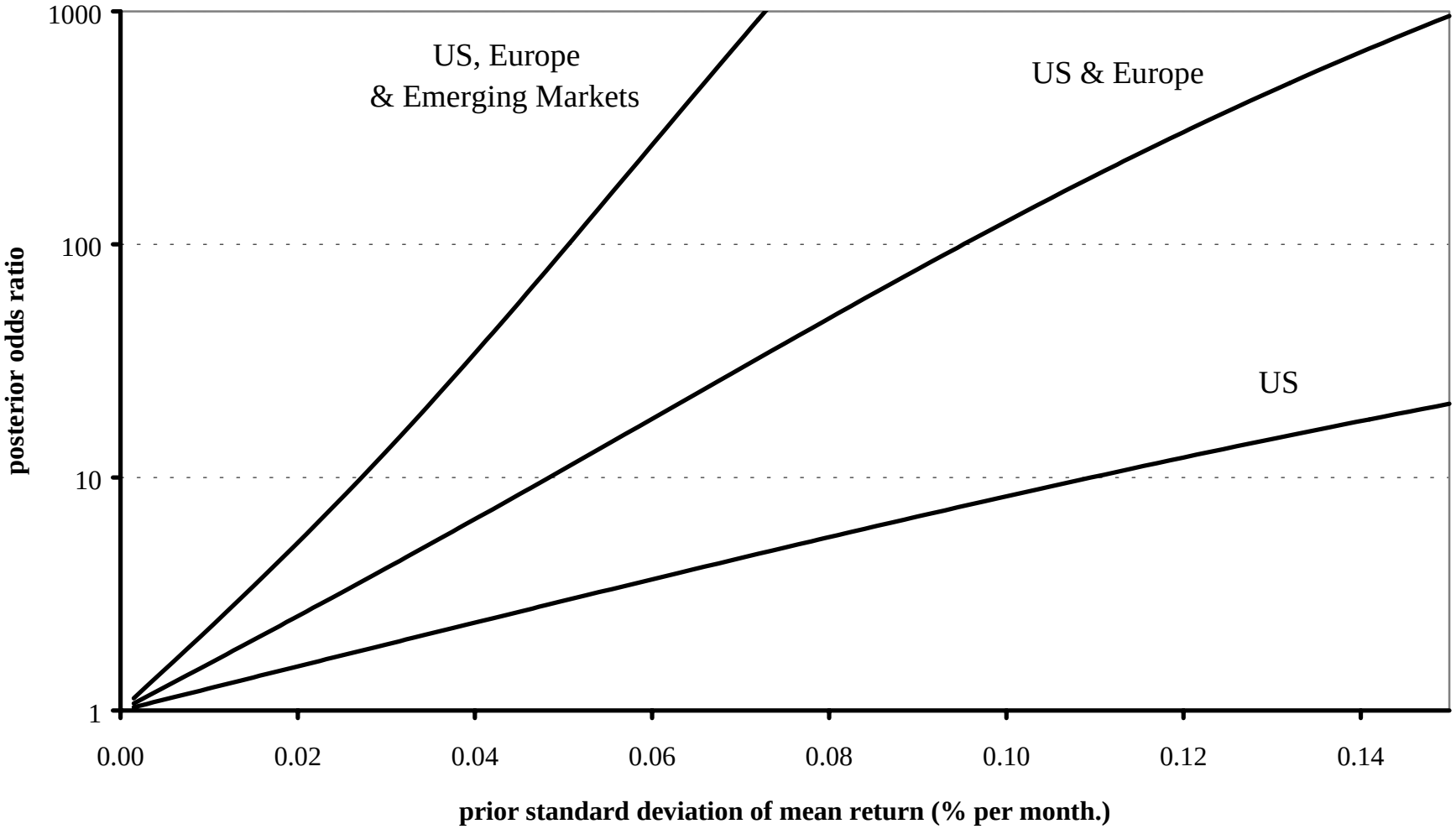

Figure 3: Posterior odds ratio of positive value premium
prior: mean return = 0