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The Cross-Section of Stock Returns

Evidence from Emerging Markets

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Several factors besides market risk — including firm size, earnings-price ratio, and turnover — are significant in explaining a cross-section of stock returns in 19 emerging markets. The signs for some factors are contrary to those documented in U.S. and Japanese markets.

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Summary findings

Cross-sectional tests of asset returns have a long tradition in finance. The often-used capital asset pricing model (CAPM) and the arbitrage pricing theory both imply cross-sectional relationships between individual asset returns and other factors, and tests of those models have done much to increase understanding of how markets price risk.

But much about the way assets are priced remains unclear. After much testing, numerous empirical anomalies about the CAPM cast doubt on the central hypothesis of that theory: that on a cross-sectional basis a positive relationship exists between asset returns and assets' relative riskiness as measured by their ßs (beta being the ratio of the covariance of an asset's return with the market return to the variance of the market return).

As tenuous as the relationship between ß and returns may be, other risk factors apparently influence U.S. equity market returns significantly: market capitalization (or size), earnings-price ratios, and book-to-market value of equity ratios. Once these factors are included as explanatory variables in the cross-sectional model, the relationship between ß and returns disappears.

Much "international" empirical work has focused on more developed markets, especially Japan and the United Kingdom, with some evidence from other European markets as well. The international evidence largely confirms the hypothesis that other factors besides ß are important in explaining asset returns.

Claessens, Dasgupta, and Glen expand the empirical evidence on the nature of asset returns by examining the cross-sectional pattern of returns in the emerging markets. Using data from the International Finance Corporation for 19 developing country markets, they examine the effect on asset returns of several risk factors in addition to ß.

They find that, in addition to ß, two factors — size and trading volume — having significant explanatory power in a number of these markets. Dividend yield and earnings-price ratio are also important, but in slightly fewer markets. For several of the markets studied, the relationships between all four of these variables and returns is contrary to the relationships documented for U.S. and Japanese markets. In several countries, exchange-rate risk is a significant factor.

With independent new empirical evidence introduced into the asset-pricing debate, future research must now cope with the idea that any theory hoping to explain asset pricing in all markets must explain how factors can be priced differently simply by crossing an international border. Is it market microstructure that causes these substantial differences? Or (perhaps more likely) do regulatory and tax regimes force investors to behave differently in various countries? As a final hypothesis, can any of these results be attributed to the segmentation or increasing integration of financial markets? Claessens, Dasgupta, and Glen offer little evidence on these questions but hope their results will spur further work on the cross-sectional relationships of markets and of assets in testing asset pricing theories.

This paper — a joint product of the Economics Department, International Finance Corporation; Environment, Infrastructure, and Agriculture Division, Policy Research Department; and the World Development Report office — is part of a larger effort to study the behavior of equity markets in developing countries. The study was funded by the Bank's Research Support Budget under the research project "Equity Portfolio Flows to Developing Countries" (RPO 678-01). Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Margaret Davis, room K6-131, telephone 202-473-9620, fax 202-676-9439, Internet address mdavis@worldbank.org. September 1995. (20 pages)

The Cross-Section of Stock Returns: Evidence from the Emerging Markets

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I. Introduction

Cross-sectional tests of asset returns have a long tradition in finance. Both the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT) imply cross-sectional relationships between individual asset returns and other factors, and tests of those models have done much to increase our understanding of the way in which markets price risk.

But much about the manner in which assets are priced remains unclear. For example, after much testing, numerous empirical anomalies relative to the CAPM cast doubt on the central hypothesis of that theory.[1] Moreover, while early work did indeed find a positive relationship between asset returns and β for the U.S. equity market, more recent evidence (for example, Reinganum (1981), Lakonishok and Shapiro (1986) and Fama and French (1992)) casts considerable doubt on that relationship.

As tenuous as the relationship between β and returns may be, a number of other risk factors apparently exhibit a considerable influence on U.S. equity market returns. Fama and French (1992), for example, find a strong relationship between equity returns and market capitalization (size, MCAP), earnings/price ratios (E/P), and book-to-market value of equity ratios (BE/ME).[2] Importantly, once these other factors are included as explanatory variables in the cross-sectional model, the relationship between β and returns disappears.

While the U.S.-based empirical evidence is interesting, it alone should not determine the manner in which one evaluates asset pricing theories as there are other asset markets around the world that may provide additional, and at times conflicting, evidence. To date, much of the "international" empirical work has concentrated on the more developed markets, in particular

the U.K. and Japan, with some evidence from other European markets as well.[1] To a large extent, the international evidence confirms the hypothesis that other factors in addition to β are important in explaining asset returns.

In this paper we expand the empirical evidence on the nature of asset returns by examining the cross-sectional pattern of returns in a number of previously unexplored markets: the Emerging Markets. Using data compiled by the International Finance Corporation (IFC) for 18 developing country markets, we examine the effect of a number of risk factors, in addition to β, on asset returns. Our work finds that, in addition to β, two factors, size and trading volume have significant explanatory power in a number of these markets; dividend yield and earnings/price ratios are also important, but in slightly fewer markets. Importantly, for a number of the markets studied here, the relationships between all four of these variables and returns is contrary to the relationships documented for the U.S. and Japanese markets. Finally, we also document exchange rate risk to be a significant factor in explaining stock returns in several countries.

These findings are important because, by introducing independent and new empirical evidence into the asset-pricing debate, future research will now be forced to cope with the idea that any theory hoping to explain asset pricing in all markets will have to explain how factors can be priced differently simply by crossing an international border. Is it market microstructure that causes these substantial differences? Or, perhaps more likely, the regulatory and tax regimes that force investors to behave differently in various countries? As a final hypothesis,

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[1] Hawawini (1988) reviews the evidence from the non-U.S. markets. Chan, Hamao and Lakonishok (1991) analyze the cross-sectional behavior of the Japanese market.

can any of these results be attributed to the segmentation or increasing integration of financial markets? We offer little evidence on these questions, but do hope that our results will induce future work to consider the cross-section of markets, as well as the cross-section of assets, when attempting to test asset pricing theories.

The outline of the paper is as follows. Section II describes the models that are examined and the estimation technique. Section III describes the data and presents the empirical results. Section IV provides concluding remarks.

II. Models

The capital asset pricing model predicts that the market portfolio is mean-variance efficient and, consequently, that there is a positive linear relationship between expected asset returns and β. In addition, the theory implies that β is the only factor that is needed to explain the cross-section of expected returns. Mathematically, the model is given by the following set of equations:

$$(1) \quad E[r_i] = \beta_i E[r_m]$$
$$(2) \quad E[r_i] = \gamma_0 + \gamma_1 \beta_i$$

where E[.] is the expectation operator, r_i is the excess return on asset i and r_m is the excess return on the market portfolio. Much of the empirical work on the CAPM has centered on tests of whether γ_1 is significantly positive. One difficulty in testing the relationship in (2) is that the dependent variable, β, is unobservable and, consequently, an estimated value must be used, which imposes an errors-in-variables bias into estimates of γ_1. This problem has been alleviated by employing portfolios of returns, rather than individual assets, a methodology introduced by

Fama and Macbeth (1973).

As explained in the introduction, much empirical work has emphasized the importance of factors other than β in explaining asset returns. Theoretically, these other factors have not been well specified, although the APT (see Chen, Roll and Ross (1986)) allows for any number of risk factors to determine the expected return on assets. Empirically, a cross-sectional model with multiple risk factors can be written:

$$(3) \quad r_{it} = \gamma_0 + \gamma_1 X_{1t} + \ldots + \gamma_k X_{kt} + \epsilon_{it} \qquad i = 1 \ldots n$$

where there are k factors that explain the cross section of returns of n assets. Of course, β may be one of those factors. Fama and French (1992) use a three-step procedure and portfolios of stocks with a model similar to (3). The first step involves grouping individual stocks into portfolios on the basis of characteristics believed to be correlated with returns. The betas of these portfolios are then estimated using a time series regression as the second step. Finally, the estimated betas are included in a series of cross-sectional regressions, which include other factors, and the average estimated coefficients are reported.

An alternative methodology for identifying the relationship between returns and stock attributes has also evolved. Brown, Kleidon and Marsh (1983) examine the size effect using a seemingly unrelated regression (SUR) methodology that estimates both time series and cross-sectional relationships simultaneously. Chan, Hamao and Lakonishok (CHL, 1991) also employ a SUR methodology when they estimate a model similar to the following:

where X_{it} is a vector of stock attributes with a corresponding vector of regression coefficients.

$$(4) \qquad r_{it} = \gamma_0 + \beta_i r_{mt} + \gamma_1 X_{it} + \epsilon_{it} \quad \forall i, \ \forall t$$

This SUR methodology avoids the errors-in-variables bias associated with the Fama and Macbeth (1973) methodology, but does not permit direct tests of the importance of β cross-sectionally, nor does it permit the cross-sectional parameters to vary over time. Importantly, the SUR methodology permits estimation using either portfolios of stocks, as in Fama and Macbeth (1973), or individual stock returns. Using individual stocks, this approach has one further advantage; based on the findings of Lo and MacKinlay (1990), grouping stocks into portfolios on the basis of observed characteristics can bias test results, a bias that is absent when individual stocks are used.

We introduce a third estimation methodology based on the panel data technique of "between estimators" described in Mairesse (1993). Using observations on i=1,...,n stocks for each of t=1,...T months, if the pooled model under investigation can be written as

$$r_{it} = \gamma_0 + \gamma X_{it} + \epsilon_{it}$$

where γ_0 is the overall intercept, X_{it} denotes a vector of independent variables and the error term ϵ satisfies the standard assumptions for residuals, then the between (stocks) estimator for the coefficients is obtained from the ordinary least squares estimator on the (cross-sectional) equation:

$$(5) \qquad r_{i.} = \gamma_0 + \gamma X_{i.} + \epsilon_{i.}$$

where

$$r_{i.} = \frac{1}{T}\sum_{i=1}^{T} r_{it}$$

and the other variables are defined similarly. Intuitively, the between regression is performed on the average cross-section. Mairesse (1993) shows that the estimator is consistent.

There are advantages that derive from using the between estimator. First, if one of the independent variables, such as β, is measured with error, then the between estimator automatically reduces the errors-in-variable bias through the averaging process that it entails (see Mairesse (1993)). In our case, with a relatively small number of firms in the cross section, this makes the between estimator preferable to forming portfolios of stocks. Second, unlike the SUR estimator, the between estimator allows estimation of (3) and the price of β risk. Third, because individual assets and not portfolios are used in the estimation, the type of bias documented by Lo and MacKinlay (1990) is avoided. And fourth, the estimator can easily deal with unbalanced panel data. Given the nature of our sample and these advantages, the between estimator for (3) is used in the results presented below.

There is substantial empirical evidence that a number of factors are significant when included in (3) or (4). For example, Banz (1981) and Fama and French (1992) find a significantly negative effect of size on returns in the U.S. and Herrera and Lockwood (1994) document a negative size effect in the Mexican market. CHL (1991) also found a negative size effect in their study of the Japanese market, but that effect largely disappeared when relative size, adjusted for overall market growth, was used in place of nominal size, as used in most other studies. Basu (1983), CHL (1991) and Fama and French (1992) also find a negative relationship between E/P and returns, even in tests that include both β and size. Fama and

French (1992) find a strong and positive relationship between the ratio of book value of common equity (BE) to its market value (ME) for U.S. market returns. Similar evidence for Japan is presented in CHL (1991).

Other influential variables have been identified. The importance of dividend yield has both theoretical justification, as well as empirical support, reflecting the tax regime and any differences between tax rates on dividends and capital gains. While the after-tax CAPM (see Brennan (1970) and Litzenberger and Ramaswamy (1979)) explicitly recognizes the importance of dividend yield, it does so on the basis of expectations of future dividends, something unobservable to the econometrician. Consequently, an important debate has raged over the years on the correct form of the explanatory variable to be used to capture this effect. As Keim (1988) reports, the empirical estimates of the tax rate implied by the model differ substantially on the basis of the form of the dividend yield variable chosen and the sample period.

Finally, while most empirical work has been centered around the unconditional form of the classic CAPM given by equations (1) and (2), an international asset pricing literature has also developed. Representative of that literature is the model of Adler and Dumas (1983), wherein exchange rate risk plays a central role. While the empirical evidence for the importance of exchange rate risk in explaining returns is not abundant, recent work is revealing. Roll (1992) examined equity returns from a number of countries and found that exchange rate effects are significant. Dumas and Solnik (1995) have also looked at the price of exchange risk and find that it is a significant factor in their data of four developed country markets.

Based on these previous findings in some of the world's major stock markets, we include the following explanatory variables in our version of equation (4): E/P, relative market

capitalization (MCAP)[2], ME/BE, dividend yield (DIV)[3] and percentage change in the local currency (relative to the dollar, FX). In addition, we also include turnover (TURN, value traded measured in dollars relative to the number of shares outstanding) as an additional explanatory variable. The decision to include turnover as an indicator of liquidity is based on the idea that many international investors have chosen to concentrate on the most liquid stocks in these markets. As a result, turnover might play an important part in determining returns.

III. Empirical Results

a. Data

The data come from the Emerging Markets Database maintained by IFC, which contains asset prices, dividends, exchange rates, trading volume and accounting ratios for a number of firms in each of 20 countries. The available sample periods are not the same for all countries, however, and in some cases data is available for only recent years.[4] The sample period chosen covers eight years, 1986-93, which provides 96 monthly observations for each country.[5] For

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[2] In line with the findings of CHL (1991), we normalize market capitalization in order to avoid the effects of overall market growth and to concentrate on relative size. To do that, each month each stock's market capitalization is divided by total market capitalization in order to determine relative market capitalization.

[3] Unlike many of the studies of the after-tax CAPM, we choose to ignore the complications involved in estimating expected future dividend yield, although we recognize the importance of that debate. Instead, we choose to include lagged dividend yield as a proxy variable for expected dividends.

[4]The database covers the period 1976-present, but not all countries are available for the entire sample period. In addition, the local market indices used in calculating β are available only from 1986.

[5] Data for Turkey begin in 1987.

all variables, except the percentage change in the exchange rate and local market returns used to calculate β, which are contemporaneous, independent variables are lagged by one month. All accounting variables are based on accounting results from the most recent financial statements that are publicly available.

Table 1 presents a list of the countries and the number of stocks in each market, as well as summary statistics for the main variables used.[6] In order to analyze the returns on a common basis, we choose to work with U.S. dollar returns (in excess of the one-month U.S. Treasury bill rate), which also lies behind our choice of the change in the local currency/dollar exchange rate as an explanatory variable. The excess market return, r_{mt}, is taken to be the local market index for each country, converted into dollars and less the U.S. Treasury bill rate.

There is a limited number of stocks in the database, ranging from a low of 22 for Colombia and Zimbabwe to a high of 137 for Korea, with the sample representing between 23.6 percent (Malaysia) and 88 percent (Venezuela) of total trading volume. Included in the sample are all stocks from each of the sample countries, some of which either entered or dropped out of the sample over the eight year sample period based on their liquidity. The low number of stocks is of some concern, but in most cases the stocks included in the sample are the most active and liquid in the market. Extending the sample of stocks, even if data were available, would be problematic given the low level of trading for most listed shares in these countries. For example, in Brazil, the top 10 stocks represent more than 50 percent of all trading, a fraction which is not unusual in these markets. In practice, the active market in Brazil is limited

[6] Times series properties for the data have been described in Claessens, Dasgupta and Glen (1995).

to about 20 stocks, all of which are included in our sample. Thus, while one could theoretically increase the number of stocks in the cross-section of each country, the stocks included in the sample are representative of the active portion of the market.

The relatively low number of stocks was an important factor in the choice of estimation technique. Forming portfolios, while at the same time maintaining a meaningful cross section, is impossible for most of the countries. Consequently, an estimation technique that allowed the use of all available data was needed; the between estimators fit that need, but at the cost that they require the estimation of a single set of cross-sectional parameters, rather than allowing for time variation. This restriction on time variation in the cross-sectional parameters induced us to limit the sample period.

The short sample period could influence the results. For example, as found in Brown, Kleidon and Marsh (1983), the effects of any of these variables may be transitory and, consequently, any significant coefficients could reflect sample-period-specific events. Despite these limitations, however, the nature of the database, the estimator and the changing nature of these markets suggest that the limited sample period is a reasonable compromise.

The five explanatory variables presented in Table 1 display substantial variation across countries. Both average returns and standard deviation of returns vary greatly across the countries, but the usual risk/return relationship is generally present and average monthly excess returns are somewhat higher than most developed markets.

Despite the number of stocks involved, the range in market capitalizations is quite impressive. For example, the ratio of the market capitalizations of the largest and smallest firms in the Brazilian sample (unreported) is 569. Only Portugal has a ratio below 20, which suggests

that if size effects exist, we might find them even within the limited sample.

It is notable that there is not a strict relationship between market capitalization and turnover. The Greek market is roughly one fourth the size of the Chilean market, but turnover in the two countries are nearly identical. Korean trading volume exceeds Malaysian volume by about one third, despite the fact that the Malaysian market is more than fifty percent larger. Taiwan is particularly notable for its high volume, as is Nigeria for its low volume.

Dividend yields vary greatly across countries and across time as well. There is no clear link between mean returns and dividend yields — Mexico and Turkey have roughly comparable mean returns, but substantially different yields. Yields vary from near zero in the case of Mexico, to 7.0 percent in the case of Nigeria.[7]

Price earnings ratios also vary greatly across countries, ranging from a low of 6.1 in the case of Nigeria, to a high of 49.5 for India. Conceptually, PE ratios are linked to growth potential and the cross-sectional variation in PE ratios agrees with that link. Brazil, for example, was facing hyperinflation and recession in 1993, while both India and Malaysia were growing steadily and without inflation.

In large part, the PBV ratios agree with the PE rankings, but with some differences, such as Greece, where prices are high relative to their book values, and Turkey, where inflation has apparently eroded asset book values. Of the 19 countries, only in Brazil are stock prices below the book value of assets, a fact which is reflected in the overall low activity in the market for new issues of equity in that country.

b. Results

[7] Glen (1995) examines dividend behavior and policy in emerging markets in more detail.

Results for equation (4) are presented in Table 2. Twelve of the nineteen countries have intercept coefficients significantly different from zero, which is at odds with the CAPM. Further evidence against the CAPM is provided by the fact that only nine of the coefficients on β are significant, one of which (Pakistan) is negative.

More interesting, is the significance and sign of the six other independent variables[8]. Most notable among the results is the size effect (MCAP). In eleven of the nineteen markets, the coefficient on the size variable is significantly different from zero, and in each of those countries the coefficient is positive, not negative, indicating that large firms in these countries produced higher returns. In contrast, most developed country evidence points to a negative relationship between size and return.[9]

What could be driving this apparently anomalous behavior? There are two obvious possibilities. First, the size effect is volatile even in the U.S.. Brown, Marsh and Kleidon (1983) find that the size effect reverses itself for sustained periods; in some periods there is a size discount rather than premium. Perhaps the sample period in this study is one such period for many of these markets. But another possibility also exists; many of these markets were increasingly opened to foreign investment during the sample period. Foreign investors may be first attracted to large (blue chip) shares, which would tend to increase their returns relative to smaller stocks. In addition, in some countries, larger firms may have had increasing access to

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[8]In order to conserve space, no results for individual stock's β's are reported. The estimated variables are, generally, significant and display variation reflecting the relative riskiness of the individual stocks.

[9] CHL (1991) document that a positive relationship between size and return using Japanese data disappears (and to some extent reverses itself) when the size variable is normalized. We also estimated the model using raw variables and obtained results similar to those reported in Table 2.

cheaper capital over this period, either domestically through government-subsidized credit or, more likely, through lower-cost international financing, which would make their equity more attractive. Finally, it is possible that trade and other reforms that occurred in many of these countries could have benefitted large firms more than their smaller counterparts.

PBV has a significant effect on asset returns in only six of the countries examined; in three of those countries the effect is positive. In these three cases, the findings are contrary to those of Fama and French (1992), who examine the ratio of book value of equity to market value of equity (BE/ME) and find a positive relationship.[10] Our findings are closer to those of Kothari, Shanken and Sloan (1995), who find little evidence in support of a PBV effect in their study of the U.S. market.

EP ratios are significantly different from zero in only 7 countries, with six of those positive. For these six countries, the results agree with the findings of Fama and French (1992). For the remaining twelve countries we find little relationship between E/P and returns, which is similar to the CHL (1991) results for Japan.

Dividend yield played an important explanatory role in 7 of the countries; in four cases that role was negative. By comparison, the after-tax CAPM of Brennan (1970) predicts that the coefficient on dividend yield in a cross-sectional relationship represents a weighted average of the tax rates of investors and, consequently, should be positive. A subsequent extension of that model (Litzenberger and Ramaswamy (1979)) allows the coefficient to be either positive or

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[10] Fama and French (1992) thus examine the inverse of our ratio. They report results using the natural logarithm of the ratio. CHL (1991) employ the ratio of book value of equity to market value of equity, as do Fama and French, but without employing the natural logarithm. CHL also find a positive relationship between that ratio and returns.

negative, depending on whether individuals' borrowing constraints are not binding or binding. Black and Scholes (1974) also suggest that a negative relationship between dividend yield and returns is possible when capital gains are taxed at a lower rate than is dividend income and investors consequently favor low dividend yield stocks. Substantial empirical evidence that the coefficient is positive for the U.S. exists;[11] however, Christie and Huang (1994) scrutinize U.S. dividends and find that the pattern of dividends change over time, sometimes positive and at other times negative.

Turnover is significant in nine of the countries; in all of those cases the coefficient is positive. Evidently, in these markets, liquidity carries with it a significant premium, which is particularly surprising as evidence from other markets suggest that investors demand a premium for illiquidity.[12] In this case, the liquidity premium may also reflect the investment patterns of international investors, who have been attracted primarily to the more liquid stocks in these markets.

International asset pricing theories such as Adler and Dumas (1983) place emphasis on the role of the exchange rate as an explanatory variable whenever deviations from purchasing power parity are significant. Table 2 provides interesting evidence related to this, with the exchange rate coefficient significantly different from zero in nine of the nineteen countries; in all but one case the sign of the coefficient is negative, with an additional five coefficients

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[11] Black and Scholes (1974) report only positive coefficients in their model, but state that the reported values reflect the sample periods and that with different periods some negative coefficients would have been produced.

[12] Amihud and Mendelson (1991) examine the effect of liquidity on both fixed income and equity instruments. Their results show that liquidity has an economically and statistically significant impact on required returns. As liquidity increases, required return declines.

negative, but insignificantly different from zero.[13] In those markets with a negative coefficient, investors required lower returns from stocks with more exposure to exchange rate risk, indicating a preference for risk with an international flavor, perhaps because of the diversification benefits that it provides to a domestic investor, or because it indicates that stocks exposed to exchange rate risk have lower variability of real returns.

IV. Conclusions

Substantial empirical evidence suggests that a number of factors help to explain the cross-sectional pattern of asset returns. This paper expands that evidence by looking at the cross-section of returns for nineteen Emerging Markets. The results confirm some of the existing evidence for developed markets, but contradictory findings are also brought to light. While size, price-to-book value and dividend yield all have explanatory power, in many cases the signs of those coefficients are contrary to those found in many developed markets. This is especially true for size. Exchange rate changes also have a strong effect on local returns, but not on dollar returns. The importance of earnings-to-price effects is limited.

As an introduction to asset pricing in these markets, this paper provides a broad overview of the importance of several factors. Much work remains to be done. Tests have shown the importance of time variation in the price of risk in emerging markets (see Harvey (1995)) and future work should incorporate that into the asset pricing framework. Moreover, much time will

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[13] It bears repeating that the foreign exchange coefficients reported in Table 2 represent the price of foreign exchange risk, that is (intuitively) the second-stage cross-sectional regression coefficient, not the coefficient from a regression of individual stock returns on the foreign exchange variable, which is the first-stage time-series regression used to estimate the variable employed in the (second-stage) cross-sectional regression.

have to be spent understanding how these markets work in order to be able to interpret the findings reported here. Tax systems, market microstructure, improvements in market structures and the opening of markets to foreign investors all could play important roles in market behavior over the sample period. Only by looking closely at the individual markets will we be able to fully understand why the results here differ in so many ways from those reported for the U.S. and other developed markets.

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1. Fama (1991) surveys much of that literature.

2. The size effect was first documented by Banz (1981); the importance of book value relative to market value of equity is explored in Stattman (1980); earnings/price effects were identified by Basu (1983).

Table 1 - Summary Statistics 1993[1]

	# Listed Co.s Total	# Co.s in Sample	Sample % of Total Volume	Mean Return (%)	Std. Dev. Return	Market Cap. ($b)	Trading Volume ($b)	DIV (%)	PE	PBV
Brazil	550	80	49.7	2.9	21.3	99.4	57.4	0.4	8.9	0.7
Chile	263	42	70.1	3.9	8.1	44.6	2.8	0.2	21.6	2.1
Colombia	89	22	61.0	4.0	9.4	9.2	0.7	0.9	26.0	2.7
Greece	143	40	56.2	2.7	13.7	12.3	2.7	4.1	15.3	4.9
India	3263	98	46.9	0.5	12.1	98.0	21.9	0.9	49.5	3.8
Indonesia	174	119	63.6	0.9	9.0	33.0	9.2	1.3	26.7	2.6
Jordan	101	36	67.7	0.6	5.0	4.9	1.4	2.2	21.7	2.5
Korea	693	137	47.6	2.0	8.9	139.4	211.7	1.2	17.7	1.4
Malaysia	410	94	23.6	2.2	7.7	220.3	153.7	1.0	43.5	9.4
Mexico	190	102	75.5	4.6	13.4	200.7	62.5	0.1	18.8	2.9
Nigeria	174	25	46.8	0.2	12.7	1.0	0.0	7.0	6.1	2.1
Pakistan	653	95	68.4	2.2	7.4	11.6	1.8	1.5	27.6	4.2
Philippines	180	41	53.0	4.3	11.6	40.3	6.8	0.4	29.5	2.8
Portugal	183	38	61.9	2.9	13.7	12.4	4.8	2.9	18.7	1.5
Taiwan	285	91	51.9	3.5	16.3	195.2	346.5	0.8	39.7	3.6
Thailand	347	73	44.6	3.5	9.3	130.5	86.9	2.0	26.1	4.3
Turkey	152	36	45.2	4.4	21.4	37.5	23.2	1.7	29.9	7.1
Venezuela	93	20	88.0	2.9	13.0	8.0	1.9	2.3	24.6	2.9
Zimbabwe	62	22	48.8	1.6	8.3	1.4	0.1	3.5	9.4	1.0

1 - All values for 1993, except mean and standard deviation of return, which are for the sample period described in the text.

Table 2 - Coefficient Estimates

The table contains the between estimator coefficients described in equation (5) for the cross-sectional model presented in equation (3). The exchange rate variable and β are estimated from times series data. All other variables are lagged observed values by one month. Standard errors are in parentheses. * indicates significance at the 5 percent level; + indictaes significance at the 10 percent level.

	γ_0	β	E/P	P/BV	MCAP	DIV	TURN	FX	R^2
Brazil	0.073*	0.002	0.007	-0.028*	0.010*	-0.296+	0.000	-1.430	0.17
	(6.43)	(0.18)	(0.45)	(-3.15)	(2.52)	(-1.35)	(0.16)	(-0.18)	
Chile	-0.003	-0.001	0.181*	0.005*	0.007*	-0.003*	-0.000	-0.642*	0.78
	(-0.41)	(-0.14)	(4.99)	(2.77)	(4.09)	(-8.44)	(-0.22)	(-2.32)	
Colombia	0.027*	0.010	-0.004	0.002	0.004	-0.013*	0.001*	0.095	0.86
	(3.07)	(0.70)	(-0.73)	(0.65)	(1.24)	(-3.09)	(2.12)	(0.34)	
Greece	-0.015+	0.022*	0.193*	0.001	0.001	0.019	0.000	0.102	0.25
	(-1.39)	(1.93)	(2.45)	(0.91)	(0.35)	(0.18)	(1.13)	(0.16)	
Indonesia	0.049*	-0.001	0.142	-0.001	0.027*	-2.090	0.000	-0.168*	0.22
	(2.56)	(-0.67)	(1.02)	(-0.25)	(4.50)	(-0.92)	(0.22)	(-3.03)	
India	0.023*	-0.003	-0.063*	-0.000	0.010*	0.094	0.000	-0.281*	0.16
	(4.53)	(-0.59)	(-1.67)	(-0.58)	(3.69)	(0.82)	(0.99)	(-3.21)	
Jordan	-0.002	0.004	0.027	-0.008*	-0.003	0.077+	0.044*	-0.051	0.18
	(-0.24)	(0.49)	(1.00)	(-2.20)	(-0.94)	(1.61)	(2.65)	(-0.30)	
Korea	-0.004	0.013*	0.047*	0.000	0.001	-0.230*	0.000*	-0.185*	0.33
	(-0.96)	(2.95)	(2.65)	(0.16)	(0.97)	(-1.90)	(2.45)	(-6.90)	
Malaysia	0.019*	-0.007+	0.013	-0.000+	0.005*	-0.093	0.120*	0.363*	0.45
	(4.47)	(-1.48)	(0.31)	(-1.43)	(2.07)	(-0.35)	(7.24)	(2.85)	
Mexico	0.017*	0.016*	0.088*	0.006*	-0.000	-0.138	0.001	-0.155*	0.54
	(2.19)	(10.87)	(2.80)	(1.70)	(-0.00)	(-0.45)	(0.35)	(-2.76)	
Nigeria	-0.123*	0.031*	-0.100*	0.002	0.010*	0.115*	5.078+	-15.030*	0.77
	(-2.95)	(2.31)	(-1.93)	(0.66)	(3.22)	(2.05)	(1.69)	(-2.47)	
Pakistan	0.023*	-0.020*	0.012*	0.002	0.007*	-0.059	0.003	-0.270	0.30
	(3.03)	(-2.66)	(1.80)	(1.03)	(2.37)	(-0.80)	(0.97)	(-1.19)	
Philippines	-0.064*	0.053*	0.428*	0.011*	-0.004	0.036	0.005*	-2.820*	0.58
	(-2.93)	(3.32)	(4.14)	(3.63)	(-0.76)	(0.38)	(2.68)	(-5.00)	
Portugal	-0.001	-0.005	0.187*	0.004	0.008+	-0.295	0.000	0.940	0.10
	(-0.05)	(-0.37)	(1.73)	(0.74)	(1.32)	(-1.21)	(0.93)	(0.64)	
Taiwan	0.020*	0.017*	0.051	-0.000	0.003	-0.124	0.000+	0.037	0.08
	(3.18)	(2.85)	(0.55)	(-0.90)	(1.20)	(-0.71)	(1.90)	(0.39)	
Thailand	0.025*	-0.005	-0.041	0.004*	0.016*	-0.169*	0.001*	0.006	0.47
	(2.05)	(-0.39)	(-0.31)	(2.77)	(4.22)	(-1.99)	(3.27)	(0.11)	
Turkey	-0.011	0.074*	-0.221+	-0.339	0.030*	0.304+	0.000*	-1.050	0.25
	(-0.31)	(2.09)	(-1.47)	(-1.06)	(3.25)	(1.54)	(1.99)	(-1.19)	
Venezuela	0.021	-0.002	0.091	-0.002	0.003	-0.013	0.000	-0.623+	-0.02
	(1.24)	(-0.14)	(0.75)	(-0.44)	(0.55)	(-0.08)	(0.12)	(-1.56)	
Zimbabwe	0.011	-0.007	0.084*	-0.006	0.033*	-0.202	-0.601	-0.753	0.30
	(0.78)	(-0.54)	(2.10)	(-0.85)	(3.54)	(-0.58)	(-0.52)	(-1.30)	

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