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"Is there a Premium for Sovereign Risk in International Equities?"

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IS THERE A PREMIUM FOR NON-BETA SOVEREIGN RISK IN INTERNATIONAL EQUITIES?

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From the perspective of a U.S. resident, the key distinction between international and domestic investing is that assets located overseas are subject to the jurisdiction of a foreign government which can alter property rights or enact laws that affect businesses in less predictable ways than the home government. This issue is generally neglected in asset pricing theory. We present a model describing an equilibrium relationship between international investors and host governments in which the former acknowledges from the start that the latter will alter payments when facing unfavorable local shocks. The asset pricing implications of such payoff rule are analyzed and confirmed by empirical tests. We further examine national equity returns in 20 emerging markets and 19 developed markets from an asset pricing perspective. After the financial liberalization, the average emerging country exposure to world covariance risk is about 0.94, much like the average developed country. This contrasts sharply with previous findings in the literature. Moreover, we find that accounting for exposure to an international sovereignty risk factor significantly improves the fit and reduces model mispricing.

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I. Introduction

After several years of academic research on emerging financial markets, the most basic question remains largely unresolved, namely are expected returns of emerging markets larger or smaller than those of developed markets and if so why. This paper is the first to address this question by combining asset-pricing theory from financial economics with the theory on country risk from international macroeconomics.

In a comprehensive survey of the effects of capital account liberalizations on emerging financial markets, Stulz (1999) suggests that because emerging markets[1] have traditionally had little systematic risk, one would expect the cost of capital in those markets to be below that in the United States (p16). This contrasts with the view of Feldstein (1997) who states that "portfolio investors typically enjoy higher yields" in emerging countries besides the opportunity to lower the overall portfolio risk (p4, 1st ¶).

At the other end of the risk-appraisal perspective, Eaton and Gersovitz (1983) suggest that "from a US or western European perspective, investments in [emerging countries] look very much riskier than investment at home." Bekaert, Harvey and Lumsdaine (1999) also argue that emerging markets are riskier than developed ones.[2] Erb, Harvey and Viskanta (1997) think that emerging markets should provide higher expected returns than developed markets due to "the combination of potential development and qualitative elements embodied in country risk measures..." (p14, last ¶).

The arguments of Stulz, Feldstein and Harvey et al. are based on high quality data from the last 25 years collected by the International Finance Corporation. Goetzmann and Jorion (1999a) suggest that whatever higher returns may appear in emerging countries result from focusing on this relatively short period and ignoring the rest of the historical record as many markets currently considered emerging were important markets early in the century and then "submerged". Returns from the most recent "emergence" period are then contaminated by last-time-up survival and should not be used as proxies for long term expected returns. Using the largest panel of returns so far collected which covers the period 1920-1995, the typical developed country had a higher mean return (4.9 percent per annum is U.S. dollars vs. 1.6 percent) and a lower standard deviation (20 percent per annum vs. 31 percent) than the typical emerging country. The yearly standard deviation was 20 percent in developed countries as opposed to 31 percent in emerging ones. When we focus on the last fourteen years, the picture changes as emerging countries experienced higher returns (22 percent) than developed ones (15 percent) and both had roughly similar standard deviations.

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[1] We will follow the International Finance Corporation's definition and label a market emerging if its income per capita is below the World Bank's threshold for a high-income country (currently about 10,000 dollars per year).

[2] "It should be mentioned that there may be good reasons for an inverse link between U.S. interest and capital flows to emerging markets. For example, the low U.S. interest rates may have increased the Americans' wealth and therefore increased their risk tolerance, leading them to rebalance toward *riskier* emerging markets" (p4, 5th ¶, italics added)

So are emerging market expected returns lower or higher than those of developed markets? And what is the appropriate metric to gauge risk in an international portfolio that includes emerging and developed markets?

This paper will attempt to clarify the puzzle by arguing that confusion may result from using a theory of international asset pricing that neglects the issue of policy uncertainty which is most salient in emerging markets. The international asset pricing theories most commonly tested in empirical work (e.g. Adler and Dumas, 1983, Ross and Walsh, 1983) distinguish "countries" as subsets of investors who use a common numeraire to translate real returns into nominal returns. To the extent that price movements are less than perfectly correlated across goods, then asset markets will present a different expected real return/variance of real return tradeoff depending on good used as numeraire. The empirical implementation of such theories amounts to using a factor that captures PPP deviations along with the world portfolio. But this extension of domestic asset pricing appears insufficient to describe the risk posed by investing overseas. In fact, after presenting their international arbitrage pricing theory model, Ross and Walsh (1983) argue that "there is nothing inherently international in the ... analysis; it can equally well be interpreted as a description of a closed economy where individuals value assets according to different price indices" (p.53). This agrees with Stulz (1995) who throws a "fundamental criticism at much of the existing literature on international asset pricing" for ignoring the effects of government regulations (p.219).

The key feature that distinguishes international from domestic investment is the fact that property rights on assets located overseas are subject to the jurisdiction of a sovereign foreign government which can alter regulations.[3] For example, since there is no supranational authority that enforces contracts or since it is costly to enforce them (e.g. trade embargoes, war), collection on international investments is subject to the willingness of the host government to respect property rights and to the maintenance of peaceful relations among nations. Williams (1975) estimates that about 20 percent of the value of foreign investments carried into or made during 1956-72 in less developed countries were expropriated without compensation during this period. Unless agents in 1975 assigned zero probability to the repetition of these events, then the ensuing sequence of observed returns is contaminated by this expectation. This suggests that beta estimated during years in which these possible events did not occur may not be a sufficient measure of risk –a fact that is most salient when analyzing returns from countries with a tradition of political and economic instability.

We are used to thinking of national market-wide indices as portfolios with little idiosyncratic noise. While it is true that such portfolios reduce the influence of individual corporate performance, it is also true that they make no attempt to reduce the influence of national regulations. In fact, since one nation is exactly the domain of application of national government policy, a country equity index exactly reflects the net effects of national policy on the discounted value of expected corporate dividends.[4] When viewed

[3] Sovereignty is defined to be "complete freedom and power to act or govern" by the Longman Dictionary of Contemporary English.

[4] Assuming that corporations listed in one country mainly represent claims on assets located in that country.

in this way, it is apparent that a national index has much regulation-type idiosyncratic risk.

One summary measure of the fears of international investors regarding this type of risk are the figures on credit rating reported by *Institutional Investor*'s survey of leading international bankers. In scale where 100 indicates the lowest probability of default, the mean sovereign credit rating across emerging economies during the last fourteen years (43.4 credit points) was about half the mean rating of developed countries (81.5). Moreover, the typical emerging country had twice the standard deviation of credit rating over time (5.2 credit points) than developed economies (2.5).[5] So in exchange for incurring one standard deviation of country credit rating, one obtains 8 mean credit rating points in emerging countries as opposed to 33 points in developed countries.

So not only is the probability of a getting your dollar back lower in emerging markets, but also the proportional change over time in this probability is much higher than in developed markets. Can this be for free? Or is this increased uncertainty of emerging markets relative to developed ones priced in equity markets?

This paper addresses the question of how is equity subject to these characteristics priced in integrated international asset markets. In order to achieve this end, we start out by identifying the payout policies that constitute a stable equilibrium in a model in which both lenders and borrowers maximize expected utility. We find that the pricing implications depend on the covariance properties of the shock that serves as a cause for sovereign intervention and the stochastic discount factor used to price assets in the world. This calls for adjusting the asset pricing models of Sharpe (1964), Lintner (1965) and Adler and Dumas (1983) to incorporate the effects of sovereignty, which is done in the empirical section.

The conclusions of this paper can be summarized as follows. For a completely diversified portfolio, investments in the typical emerging country pose an incremental risk that is similar to that of adding the typical developed one. This contrasts sharply with previous results in the literature, which had found much smaller betas in emerging markets than in developed markets. To address the issue of sovereign risk, we postulate that investments in emerging markets are a bundle of two basic securities. On the one hand is a standard claim on equity, which pays a risk premium as a function of its world beta. On the other hand there is a bet on national government policy, which we model as an option to harm businesses sold by the investor to the host government. To the extent that changes in government policy are uncorrelated with movements in the world portfolio (and assuming no transactions costs) the price of this option should be the expected harm of the policy per dollar invested. The subsequent realization of government policy impacts actual returns as well as the premium of like options for ensuing periods. In countries with much policy uncertainty, the cost and payoff of this option may explain a large share of the variation in actual returns. During a given period in which the government

[5] Note that the variance is affected by the scale of the random variable (i.e. a variance of 1 about a mean of 10 implies a higher relative volatility than a variance of 1 about a mean of 100, although the two variances are numerically identical). The mean over standard deviation ratio is a scale-free measuring stick.

abstained from exercising its right to harm businesses, observed returns will reflect the holding of the equity plus the collection of the premium on the option sold to the government. The empirical evidence presented below is consistent with this theoretical formulation.

The rest of this paper is organized as follows. Section II presents a theoretical model emphasizing the differences between domestic and international investing subject to sovereign intervention and its asset pricing implications. Section III describes the data used and presents a summary statistical description of facts about emerging market returns and how they compare with those of developed markets in the post-financial liberalization period. Section IV conducts empirical testing of the refutable propositions emerging from the theory in section II. It also tests an international version of the capital asset pricing model which is later expanded to a two factor model reflecting the returns to a portfolios that intends to capture the returns to sovereign risk.

II. A Theoretical Model of Sovereign Intervention With Risk Averse Investors

International macroeconomists have recognized the peculiar features of holding debt subject to sovereign risk at least since Eaton and Gersovitz (1981). In particular, Grossman and Van Huyck (1988) and Calvo and Kaminsky (1991) propose models of tacit agreement between lenders and borrowers in which default is excused when it follows a negative realization of a local shock that is verifiable by all parties.[6] Both of those models assume that international investors are risk neutral. The intuition for such models is that when lending to a foreign government, risk neutral investors charge an interest rate higher than the risk free rate because they anticipate default in some states of nature.

In this section, we extend the model in Grossman and Van Huyck (1988) to ask how is foreign *equity* priced in an integrated world economy in which risk *averse* investors admit from the start the potential effects of the rules that the investment host government is sovereign to enact.

II.a. The International Setting

The representative world investor chooses the quantity of risky equity to purchase (k^*) in order to maximize a discounted utility of two period consumption.[7] Consumption results from adding to a random income shock $e^*(w)$ the net investment proceeds. In exchange for paying the price p^* in one period, the investor is entitled to the marginal product of

[6] Cole, Dow and English (1995) model a similar situation triggered by changes in the time preference of the governing group.

[7] Using * to denote a world variable.

capital, $G_k'(k^*, w_j)$, which is subject to a random shock w affecting the world during the following period.[8] Capital depreciates fully in one period and the production function has positive and diminishing marginal products. The problem is,

$$\begin{aligned} \underset{k_t^*}{\text{Max}} \quad & u(c_t^*) + E_t \rho u(c_{t+1}^*) \\ \text{s.t.} \quad & c_t^* = e_t^* - p_t^* k_t^* \\ & c_{t+1}^* = e_{t+1}^* + G_k'(k_t^*, w) \; k_t^* \end{aligned}$$

Rearranging the first order condition for this problem we can solve for the price of this risky asset as a function of its covariance with the intertemporal marginal rate of substitution in consumption as in,

$$p_t^* = E_t \left\{ \frac{\rho u'(c_{t+1}^*)}{u'(c_t^*)} \cdot G_k'(k_t^*, w) \right\}$$

This is the canonical asset pricing equation which suggests that assets whose payoffs tend to covary more positively with marginal utility of future consumption will sell for a higher price as they can be used for consumption smoothing. Normalize the price level to be one, and multiply both sides by k_t^* which is conditionally known at t to obtain,

$$(1) \qquad k_t^* = E_t \left\{ \frac{\rho u'(c_{t+1}^*)}{u'(c_t^*)} \cdot G_k'(k_t^*, w) \cdot k_t^* \right\}$$

Equation (1) is a fair pricing condition which describes the optimal amount of investment in the risky asset that the international consumer will want to do. Below, we will use the shorthand notation m_{t+1}^* to denote $\frac{\rho u'(c_{t+1}^*)}{u'(c_t^*)}$.

II.b. The National Setting

Let local output result from adding a random local shock z to the yield of the local production function. The local production technology, F, is defined to be

$$F(k, w_j) = \begin{cases} G(k, w_j) & \text{if} \quad k \le K \\ R^f & \text{if} \quad k > K \end{cases}$$

[8] Unsubscripted lowercase w and z are used to generically denote the respective random variables, while w_j, $j=1,\ldots,M$ and z_i, $i=1,\ldots,N$ denote the particular realizations of them.

where K is a level of foreign investment to be pinned down by equation (7). This local production function only uses international capital and is subject to the world shock (w) that affects all countries by the same magnitude. Consumption results from subtracting from local output an actual service payment to international investors, s_{t+1}, which can depend on the world and local shocks.

$$(2) \qquad c_{t+1}(k_t, w_{t+1}, z_{t+1}) = F(k_t, w_{t+1}) + z_{t+1} - s_{t+1}(w_{t+1}, z_{t+1})$$

We assume that the local shock is independent of the world shock and that k and s are non-negative.[9] We assume that z has a discrete distribution with probability mass function

$$\Pr(z = z_i) = \begin{cases} p_z(z_i) & \text{if} \quad z_1 \le z_i \le z_N \\ 0 & \text{otherwise} \end{cases}$$

which is independent and identically distributed over time. Similar assumptions and notation apply to the world shock. The government maximizes the present value of expected utility of the consumption stream,

$$V_t = u(c_t) + \sum_{\tau=t+1}^{\infty} (\beta\gamma)^{\tau-t} E_t[u(c_\tau)]$$

where β represents a pure time preference parameter and γ is the probability that the administration presently in power survives until next period –as the present administration only cares about the discounted utility while it is in power. The government maximizes this utility function by selling a quantity of fairly priced equity k and by designing a state-contingent policy to service this investment $S_{t-1}(w_j, z_i)$, $j = 1,...,M$, $i = 1,...,N$. We assume that the net time preference parameters are equal at home and abroad, $\rho = \beta\gamma$. Further, assume that the service payoffs in the w dimension are determined by corporate decisions which are the same at home and abroad. Nevertheless, the government is entitled to alter the payoffs in the z dimension.

Equation (1) describes the fair pricing of all securities in the world. Because investments in the local economy are subject to sovereign jurisdictional risk, investors know that the actual payment s_t will not necessarily always equal the marginal product of capital in the world (which is what private corporations would choose to do). In fact the investment-host government is sovereign to change the servicing payment once the investment has been made. Whatever the local service payment, the expectation that investors have of it must comply with the fair pricing condition (1) prevailing in the world

[9] If s were negative, then this country would obtain an indemnity from international investors. Although such insurance has played a role in the literature, we rule it out since such contracts are hard to find in practice.

(3) $\quad E_t\left\{m^*_{t+1} \cdot S^I_t(w,z)\right\} = k_t$

where $S^I_t(w,z)$ denotes the investor's expectation of the future service payment[10] conditional on the local and world shocks .

So there are three service variables: $S_t(w,z)$ is the service policy that the government announces, $s_{t+1}(w,z)$ is the actual service payment in the next period, and $S^I_t(w,z)$ is the investors' expectation of the actual future service payment for a given set of shocks.

A benchmark case for analysis can be obtained by assuming that the government can irrevocably precommit to an investment servicing policy. In this case, all three service variables are identical and the government treats investor's expectations as a choice variable.

Because each z and w shock is i.i.d. and since we rule out the possibility that the sovereign accumulates wealth over time, then the problem for the government is identical in every period and reduces to

$$\max_{k,\ \{S(w_j,z_i)\}_{i=1}^{N}} \quad E_t u(c_{t+1}) \qquad \text{subject to}$$

(3) $\quad E_t\left\{m^*_{t+1} \cdot S(w,z)\right\} = k_t$

(4) $\quad c_{t+1} = F(k_t, w) + z - S(w,z)$

$k \geq 0,\ S(w,z) \geq 0$

The langrangian for this problem is,

$$L = \sum_{j=1}^{M}\sum_{i=1}^{N} p_w(w_j)\ p_z(z_i)\ u(c_{t+1}) + \lambda\left\{\sum_{j=1}^{M}\sum_{i=1}^{N} p_w(w_j)\ p_z(z_i)\ \left[m^*_{t+1}(w_j)\, S(w_j,z_i)\right] - k\right\}$$

The necessary first order conditions include (4) and,

$$\frac{\partial L}{\partial k} = \sum_{j=1}^{M}\sum_{i=1}^{N} p_w(w_j)\ p_z(z_i)\ u'(c_{t+1})\, F'_k(k,w_j) - \lambda = 0$$

$$\frac{\partial L}{\partial S(w_j,z_1)} = \sum_{j=1}^{M} p_w(w_j)\ p_z(z_1)\ u'(c_{t+1})(-1) + \lambda\sum_{j=1}^{M} p_w(w_j)\, p_z(z_1)\ m^*_{t+1}(w_j) = 0$$

$$\vdots$$

$$\frac{\partial L}{\partial S(w_j,z_N)} = \sum_{j=1}^{M} p_w(w_j)\ p_z(z_N)\ u'(c_{t+1})(-1) + \lambda\sum_{j=1}^{M} p_w(w_j)\, p_z(z_N)\ m^*_{t+1}(w_j) = 0$$

[10] With respect to the joint density of w and e.

The second through $N+1^{st}$ equations imply an equal expectation over the range of w of the marginal utility of consumption in each state z_i, as in[11]

$$(5) \qquad \sum_{j=1}^{M} p_w(w_j)\ u'[c_{t+1}(z_1)]\ R^f = \ldots = \sum_{j=1}^{M} p_w(w_j)\ u'[c_{t+1}(z_N)]\ R^f = \lambda .$$

Since z and w are independent and since z enters additively in consumption the equality can only hold if[12]

$$(6) \qquad u'\big(c_{t+1}(w_j, z_i)\big) = u'\big(c_{t+1}(w_j, z_{i+1})\big) \qquad i = 1,\ldots, N-1,\ j = 1,\ldots, M$$

For whatever value of w, the government will choose a service policy that smoothes consumption in the z dimension. Using a hat to denote the solution, we require $\hat{c}(w_j) = c(w_j, \bar{z})$ where $\bar{z} = E(z)$. The second order conditions will require that the government be risk averse in order for the solution to represent a maximum.

Plugging (5) and (6) into the first FOC implies

$$(7) \qquad \sum_{j=1}^{M} p_w(w_j)\ u'[c_{t+1}(w_j, \bar{z})] \cdot F_k'(k, w_j) = \sum_{j=1}^{M} p_W(w_j)\ u'[c_{t+1}(w_j, \bar{z})] \cdot R^f$$

Condition (7) requires that investment in the production technology be carried up to the point at which the expected marginal utility of investing one dollar in the productive technology be the same as putting that same dollar in the risk free asset.[13] Define K to be the level of investment at which this production efficiency condition is just satisfied. Since the production function G is assumed strictly concave in k, this condition requires that if the economy where to attract foreign investment beyond the level K, it would have to reinvest these incremental funds abroad at the international risk free rate in order to be

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[11] Note that equation (1) prices all assets in the world. This includes the international risk free security. For that security we have $\sum_{j=1}^{M} p_W(w_j)\, m_{t+1}^{*} R_{t+1}^{f} = 1$. Because the payoff to this security is conditionally risk free, it is constant within the range of w and so comes out of the summation. This implies $E_t\left(m_{t+1}^{*}\right) = \dfrac{1}{R_{t+1}^{f}}$.

[12] Let $g(z_i) = \sum_{j=1}^{M} p_w(w_j)\ u'[c_{t+1}(z_i)]$. Note that when the z shock is additive in consumption, so $g'(z_i) = \sum_{j=1}^{M} p_w(w_j)\ u''[c_{t+1}(z_i)] \dfrac{\partial c_{t+1}}{\partial z_i} < 0$ by risk aversion. Given that $g(z_i)$ is monotonically decreasing for all i, $g(z_i) = g(z_{i+1}) \Leftrightarrow z_i = z_{i+1}$.

[13] The analog of this condition in a riskless world is that the marginal product of capital be equal to the interest rate.

at a maximum. In a riskless world, the economy allocates funds along the upper envelope of the marginal productivity of capital and one plus the interest rate.

Condition (6) requires,

$$\hat{c}(w_j) = \sum_{i=1}^{N} p_z(z_i)\ \{F(k, w_j) + z_i - S(w_j, z_i)\}$$

$$= F(k, w_j) + \bar{z} - \sum_{i=1}^{N} p_z(z_i)\ S(w_j, z_i)$$

But from the fair pricing conditions (1) and (3) we need[14]

$$\sum_{j=1}^{M} p_w(w_j)\ m^*(w_j) \left\{ \sum_{i=1}^{N} p_z(z_i) S(w_j, z_i) \right\} = \sum_{j=1}^{M} p_w(w_j) m^*(w_j)\ \{G'_k(k, w_j)\ k\} = k$$

A sufficient condition for this to hold is that the terms in brackets be equal. In this case, the optimal consumption policy becomes,

(8) $$\hat{c}(w_j) = F(k, w_j) + \bar{z} - F'_k(k, w_j)\, k$$

and the optimal service policy results from the definition of consumption as

(9) $$\hat{S}(w_j, z_i) = z_i - \bar{z} + F'_k(k, w_j)\, k$$

The non-negativity of the service payment puts a lower bound on the amount of foreign investment that must be secured in order to guarantee smooth consumption if the worst possible local shock were to materialize. A sufficient condition for,

$$\min\left(z_i - \bar{z} + F'_k(k, w_j)\, k\right) \geq 0$$

is that

$$\min(k) \geq \frac{\bar{z} - z_1}{\min\left(F'_k(k, w_j)\right)}$$

If this condition is satisfied, then the non-negativity condition of k will be satisfied since $\bar{z} > z_1$ and the marginal product of capital is always positive. The interpretation of this condition, is that the country will use local holdings of foreigners as a prepaid indemnity in case the local shock turns out to be bad. This equation specifies the minimum foreign holdings required in order to fully insure the local economy from the z shock, if this shock were to have its worse possible outcome, z_1.

[14] The remaining part of this section is still preliminary.

So the optimal level of foreign investment is

$$(10) \qquad \hat{k} \geq \max\left(K \ , \ \frac{\overline{z} - z_1}{\min\left(F_k'(\hat{k}, w_j)\right)} \right).$$

Equations (8)-(10) describe the solution to the maximization problem of the government under irrevocable precommitment. Note that the irrevocable precommitment solution will ensure production efficiency as $k \geq K$ and efficient international risk sharing of the local shock which will not affect local consumption.

Grossman and Van Huyck (1988) discuss the dynamic consistent levels of borrowing, consumption and servicing that prevail when the government can not irrevocably precommit. In this setting, there may be states of nature in which it is beneficial for the government to disappoint the investor's expectations regarding the amount of servicing. When the dynamic consistency constraint is binding the level of foreign investment may not satisfy a condition analogous to (10). Either or both of the production efficiency constraint and the efficient international risk-sharing constraint may be violated in this setting.

In sum, this section has presented a theoretical framework that models the difference between domestic investment [i.e. the right to receive $k \cdot G_k'(k, w_j)$] and international investment [i.e. the right to a servicing policy that has the same covariance with the intertemporal marginal utility of international consumption as domestic investment but that will depend on the foreign country shock z].

Under this formulation the data generating process for returns to international investment will follow equation (9). It then becomes interesting to posit an empirical model that reflects differences in the data generating process depending on the distribution of z. Variables that affect both the servicing policy and the distribution of z are likely to affect observed returns. This benefit should be more pronounced in those countries that more frequently resort to their sovereign authority to alter private contracts.

In particular, if the distribution of z is left-skewed, so that the median is greater than the mean, it is to be expected that all but the very long time series will show positive realizations of $(z - \overline{z})$. Grossman and Van Huyck give heuristic arguments for why we can not assign zero probability to the event that governments repudiate obligations to foreigners and temporarily switch to autarky. As reported by Williams (1975) the historical record contains events in which host governments resorted to the most extreme measures against foreign investment, namely outright confiscation. Specifically, about 20 percent of the value of foreign investments carried into or made during 1956-72 in less developed countries was expropriated without compensation during this period. Eaton and Gersovitz (1983 and 1984) provide theoretical models of expropriation and evidence that multinational corporations strategically located plants across different countries in

order to minimize expropriation risk. In light of such evidence, it is natural to expect that investors likewise demanded a premium to hold claims on assets with similar risk profile.

The empirical section below samples returns from the post-financial liberalization sub-period after April 1986 because the aim is to test an open economy theory of asset pricing and various authors have documented financial liberalizations in the twenty countries that we study to have taken place after 1986. But the period 1986-99 has been relatively peaceful in international relationships and a large majority of governments shifted towards more market friendly policies than they had implemented before. As a result, this paper conjectures that the sample period involved realizations of $(z - \bar{z})$ that were positive on average.[15]

A Simple Example

Note that if we assume that m^* is a linear function of the return on the world portfolio then (1) implies the capital asset pricing model (CAPM) equation (see Ferson, 1995)

$$E_t\left(r_i(t+1)\right) = \beta_i E_t\left(r_w(t+1)\right)$$

Suppose that a risk averse resident of the United States holds a well diversified portfolio which includes two shares of a major local corporation in a world where expected returns are correctly described by the unconditional CAPM. One day, this person is approached by the devil who proposes the following deal for one of those two shares. On the next period, the devil will either confiscate that share from the investor (let d=0 in this case) or will give the investor one additional ordinary share of the same company (d=1) with equal probability. After that, the devil will again propose to enter into the same deal. The devil's decision will be independent of movements in the aggregate market and it will be serially independent. Three questions arise, how much does a risk averse investor charge the devil per period to enter into this deal, what happens to actual and to expected returns.

Let us label r be return on the share unaffected by the trade with the devil, and r^d the return on the share subject to the contingent claim. The expected return on the share that did not enter the contingent claim is described by

$$E(r) = \beta\, E\left(r^w\right)$$

and assuming no dividends, the price of this share is

$$P_0 = \frac{E_0(P_1)}{1 + E_0(r)}$$

[15] This is tantamount to the *Peso* problem studied in the foreign exchange literature.

The payoffs next period on the share subject to the contingent claim are

$$P_1^d \begin{cases} 2P_1 & \text{with probability } 0.5 \\ 0 & \text{with probability } 0.5 \end{cases}$$

Since the devil's decision is orthogonal to market movements, it can be diversified in a portfolio, which implies that the discount rate for the cash flows on security d is equal to r and the price of that share is

$$P_0^d = \frac{E_0(P_1^d)}{1+E_0(r)} = \frac{1}{2}\frac{E_0(2P_1)}{1+E_0(r)} = P_0$$

so that the two claims sell for the same price.[16] The observed return contingent on the devil's actions are

$$r^d(d=1) = \frac{2P_1 - P_0}{P_0} = \frac{P_1}{P_0} + \frac{P_1 - P_0}{P_0^d} = 1+2r$$

$$r^d(d=0) = \frac{0 - P_0^d}{P_0^d} = -1$$

Note that the expected return on the two shares held by the investor is the same, as

$$E_0\left(E\left[r^d\right]\right) = E_0\left(\frac{2r+1-1}{2}\right) = E_0(r)$$

or because they both have the same beta

The discount rate is the same for both securities because they have the same unconditional beta

$$\beta_d = \frac{Cov(r_d, r_W)}{Var(r_W)} = \frac{\sum_{s=1}^{T}(-1-\bar{r})(r_W^s - \bar{r}_W) + \sum_{t=1}^{T}(2r^t + 1 - \bar{r})(r_W^t - \bar{r}_W)}{2T} = \frac{2\sum_{t=1}^{T}(r^t - \bar{r})(r_W^t - \bar{r}_W)}{2T} = \beta$$

In sum, under complete portfolio diversification the two shares of the same company will have the same expected return and will sell for the same price. During periods in which the devil confiscated, the observed return will be –1 and during the periods in which the devil gave out a share the observed return will be 1+2r. If we observe a sequence of r^d taken from a period in which the option to confiscate was not exercised, and we regress those returns on the world portfolio, we will compute a beta that is twice the true beta and we will obtain an alpha of 1. The share entered into a trade with the devil will seem to have a positive risk-adjusted return!

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[16] Note that given a risk averse investor, any transactions costs will make $P_0^d < P_0$.

II.c. Paradoxical Effects of Financial Liberalization on Observed and Expected Returns

A number of issues confound the relation between expected return, actual return and risk in the period since 1975 for which high-quality data are available from the International Finance Corporation of the World Bank (IFC). Most of the emerging countries usually studied in the asset pricing literature changed the restrictions on foreign ownership of local securities during the late eighties. Stulz (1999) and Bekaert and Harvey (1995) suggest that when foreigners are precluded from owning local assets, the relevant measure of risk for a country index should be the variance of the local market. In a market with unrestricted foreign ownership, the contribution of that country to the variance of the world market should be the appropriate measure of risk. In a market that is partially integrated, Bekaert and Harvey (1995) propose using a combination of local and world indices. Goetzmann and Jorion (1999a) argue that this will improve the econometric fit even when local variance plays no role in pricing equities, but simply because high local variance increases the upward bias in the survival-conditioned series.

When a country liberalizes international access to its financial market and simultaneously allows local residents to invest overseas,[17] assets start being priced in a global market and expected returns should fall since the representative investor now has more options to diversify local risk than were available prior to the liberalization. But from the present value equation, for a given expected sequence of cash flows, the fall in the discount rate should boost prices. "The prospect of lower expected returns on equity (subsequent to the liberalization) has the paradoxical implication of increasing average returns on equity when measured over the liberalization period" (Stulz, 1999).

This fact underscores the importance of careful selection of the sample period over which to estimate an asset pricing model in economies that underwent liberalizations. Financial economists usually estimate expected returns by computing a function of sample mean returns. Underlying this practice is some version of the law of large numbers which states that the difference between the sample mean return and its expectation is arbitrarily small in large samples. But laws of large numbers assume that the data at hand are a random sample from a distribution with a fixed mean. As argued above, the mean return is expected to change when an economy goes from isolation to integration. It is then inappropriate to estimate expected returns by using sample means of observed data measured during the pre- and post-liberalization periods without controlling for the break.

In order to maximize power Harvey (1995) and Erb, Harvey and Viskanta (1995) used as many observations as possible in their estimations. As a result, returns from potentially distinct data generating processes were used to construct one estimate of expected return. More recent work (Bekaert et al., 1997) acknowledges the instability of the return distribution and computes different moments for the 1980s than for the 1990s. The

[17] Assuming that the previous restrictions on holdings of foreigners were binding.

present paper makes that distinction precise by constructing country-specific samples based on the liberalization dates identified by Henry (2000). Henry constructed a chronology of liberalizations in twelve emerging markets based on either the abolition of restrictions that precluded international investors from holding a given country's equities, the introduction of specific country funds in the US market or a jump in the IFC's investability index greater than ten percent.[18] For the remaining eight countries considered here but not studied by Henry, the liberalization dates are proxied by the breakpoint dates reported by Bekaert, Harvey and Lumsdaine (1998) who use time series techniques to identify break-points in the return and capital flows series. Fourteen of the twenty emerging markets considered here either liberalized or experienced breaks between 1986 and 1990. Since most developed countries liberalized their financial markets during the late seventies and early eighties [Stulz (1999), Gultekin, Gultekin and Penati (1990)] the sample for developed countries considered below starts uniformly in April 1986.

III. DATA SOURCES AND BASIC FACTS ABOUT EMERGING MARKET RETURNS IN THE POST-LIBERALIZATION PERIOD

III.a. Data Sources

The data used in this study comes from two sources. Equity returns, market capitalization, dividend yields, and exchange rates for emerging markets come from the Emerging Markets Data Base of the International Finance Corporation (IFC), a branch of the World Bank. The data on equity returns pertain to the IFC global indices which are value-weighted indices that intend to capture about 65% of total market capitalization in each country. The IFC defines a market as emerging if its GNP per capita is below the high-income country threshold (which was 9400 $ per year in 1995). This paper studies the twenty emerging markets more commonly analyzed in the literature to facilitate comparison with that work. These twenty countries account for about 75 percent of the total capitalization of the 51 countries covered by the IFC. The 31 countries not covered here have time series shorter than seven years.[19]

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[18] The investability index is the ratio of total capitalization of stocks that foreigners can hold to total market capitalization.

[19] According to the IFC, it coined the term "emerging" stock markets in 1981 as a way to categorize the stock markets of developing countries, though some of these markets had existed for more than a century and some were at one time or another considered to be international financial centers in their own right. The IFC produces two types of indices, the global indices, which are available since 1975 and the investable indices which are available since 1993. The investable indices exclude from the global indices those shares that can not be purchased by foreign investors in each country. Whereas there are 2000 stocks that make up the global indices, only 1250 are part of the investable indices. Since 1994, the global indices intend to capture between 60 and 75% of the total market capitalization of all exchange-listed shares in each market (IFC, 1999). As a result, the capitalization figures reported by the IFC were divided by .65 in order to obtain the figures shown in table I. The global indices began being computed in 1975 for nine emerging countries and were based on the ten or twenty most active shares in each market. In 1978 Jordan was added to the list. In 1985, the IFC expanded its coverage to seven more markets and also increased the

Equity returns for the 19 developed countries as well as for the world equity market portfolio are compiled by Morgan Stanley Capital International (MSCI) and are taken from Datastream. Developed market capitalization data are also from Datastream but are compiled by Financial Times/S&P Actuaries World Indices. For the majority of developed countries, the capitalization data begins in June 1988. The data was backward extrapolated to April 1986 using the total return for each country from the MSCI country indices. To the extent that there were new public offerings in these countries during this interval, the initial capitalization value reported in table I overstates the actual capitalization in April 1986.[20] Data on the US one month treasury bill (our proxy for the risk free rate) comes from the corresponding Salomon brothers index which is distributed by Datastream. Data on interest rates for each country are from International Financial Statistics of the IMF. Data on liberalization dates for each country come from either Henry (2000) or from Bekaert, Harvey and Lumsdaine (1998). Returns are in US dollars in excess of the return on a fund of Treasury Bills with a target maturity of one month (i.e. excess returns).

III.b. Basic Facts: Emerging and Developed Country Returns, 1986-1999

The total equity market capitalization of the developed and emerging countries in this study grew from 4.5 trillion US dollars in April 1986 to 23.2 trillion in March 1999 (or by a factor of 5.1).[21] Emerging markets as a whole went from 1.7 percent of total capitalization at the beginning of the sample to a maximum of about 13.2 in September 1994. The sequence of crises in Mexico (1994), Asia (1997), Russia (1998) and Brazil (1999) together with the rise in US equity values diminished the relative importance of emerging markets to 4.73% of total world equity capitalization by the end of the sample.[22]

The largest emerging market is Taiwan, which accounts for about one percent of world equity. The next biggest markets are Mexico, South Korea and Brazil with about one half a percentage point of world capitalization each. There are four emerging markets

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number of stocks covered in each market. Portugal and Turkey were added in 1989 and Indonesia was added in 1990. Country coverage continued to expand in the 1990s adding China, Hungary, Peru, Poland and Sri Lanka (1993), South Africa (1994) and the Czech republic (1995). Seventeen more markets were added to the list in late 1996. In early 1996, the IFC began adjusting the indices for cross-holding of shares. The adjustments eliminated double-counting distortions and reduced the reported capitalization of stock markets where cross-holding is prevalent. Later on that year, the IFC began removing government holdings from the market capitalization of the index constituents. These changes may show as sharp reductions of market capitalization after 1995 (see figure I) when the fact is that the value reported for previous years was artificially high.

[20] Because the target share of market capitalization coverage for these indices is in the range of 82 to 90 percent (FTSE, 1999) the FT capitalization figures were divided by 0.85 in order to obtain the numbers reported in table I. See how FT/S&P treats crossholdings.

[21] To the extent that coverage of total market done by the IFC in the early years was lower than the 60-75 percent target prevailing since 1994, the initial emerging market capitalization figures may be artificially low, and the steep rise in 1994 may be artificially high.

[22] 5.4 percent if South Africa and Israel are added to the emerging country list.

with market caps above 100 billion at the end of the sample, whereas five developed markets do not surpass this level (Denmark, Singapore, Norway, Australia and New Zealand).

Taken together, the capitalization of the 20 emerging economies in this study accounted to about 72 percent of the Canadian market at the beginning of the sample. At the end of the sample, it amounts to are about 2.5 the size of Canada or the size of Canada, Austria, Australia, New Zealand, Denmark and Sweden taken together.

Figure I.B plots each country's share of total world cap again the average percentage monthly increase in market cap. It reveals that the distribution of world equity capitalization is quite skewed. The United States accounts for about 53 percent of world cap followed by the United Kingdom and Japan with about 10% each. The remaining 27 percent of world capitalization is divided between the other 36 countries considered here, with only France, Germany, the Netherlands, Italy and Switzerland in the 2 to 4 percent range. Also, Argentina, Turkey, the Philippines, Mexico and Chile had the largest average monthly increase in market capitalization over the sample. This is associated with the sizable privatizations followed by public offerings that took place in those markets during the 13 years of the sample.

Table II presents the basic descriptive statistics of the 39 countries' national index returns considered in this study. The first three columns reproduce data from Harvey (1995) –a paper that will be used as a benchmark for comparison for the rest of this work. The sample period used by Harvey together with the mean and standard deviation are reported. It should be noted that Harvey used raw returns to compute the means and standard deviations, whereas excess returns are used here (so the mean one month US Treasury Bill return which was 0.4 percent per month should be added to the arithmetic means reported for the post-liberalization period to make them comparable with those reported by Harvey). At any rate, the mean returns during the Harvey sample are generally much higher than those in the post-liberalization period.[23]

The next two columns present the liberalization dates taken from Henry (2000) and from Bekaert, Harvey and Lumsdaine (1998) and the number of resulting post-liberalization monthly observations.

The next five columns present the first four sample moments of excess returns together with the geometric mean of gross excess returns (minus one).[24] The geometric mean can be interpreted as the internal rate of return of investing a dollar in one country and leaving it there for the length of the sample period (i.e. the return to a buy and hold

[23] Since the Harvey sample ends in 1992, it includes data on pre- and post-liberalization for the 17 countries that liberalized prior to June 1992.

[24] If the return in period t is r_t, then the geometric mean return during the period $[1,T]$ is defined as $\bar{r}_g$ where $1+\bar{r}_g = \left(\prod_{t=1}^{T}(1+r_t)\right)^{1/T}$. By Jensen's inequality, the geometric mean is always smaller than the arithmetic mean.

strategy). The point of showing the two types of means is that the geometric mean is less sensitive to outliers than the arithmetic mean. Individual emerging markets' returns tend to be more skewed to the right and more leptokurtic than those of developed markets, even when we restrict the emerging market sample to the post-liberalization period.

The next two columns report the *p*-values associated with the Jarque-Bera and Shapiro-Wilk statistics to test the null hypothesis that each country's returns come from a univariate normal distribution. There are five (twelve) non-rejections of the null among the emerging (developed) countries based on the Shapiro-Wilk test.

The last three columns report the partial autocorrelation coefficients at lags one, two and twelve. Eight of the twenty emerging markets exhibit significant first order serial correlation while only two of the 19 developed markets have this property. Taken together, these results confirm the previous findings of Harvey (1995) in that emerging returns tend to be higher, more volatile and more predictable than those of developed markets.

Figure II plots the monthly mean and standard deviation of return in excess of the risk free rate for different periods. The top panel computes these moments for the 39 countries in this study for the full sample. The dots with the number 1 pertain to emerging markets, whereas those with the number 2 indicate developed countries. Six portfolios are considered in this study (indicated with a number 3 in figure II): an equally weighted portfolio of developed countries, an equally weighted portfolio of emerging markets, the IFC composite which is a value weighted portfolio of emerging markets, two high-credit-risk minus low-credit-risk portfolios which will be described later and the value-weighted MSCI All Country World portfolio. Since the MSCI All Country portfolio is only available since 1988, the plain MSCI World portfolio (which excludes emerging markets) is used during the first twenty months of the sample.

It is apparent from the top panel that the emerging country returns tend to be higher and more volatile than those of developed countries. Much of this volatility can be reduced through portfolio formation as both portfolios of emerging market securities have standard deviations within the range of that of developed countries.

The middle and bottom panels of figure II focus on the post and pre-liberalization periods respectively. The behavior of emerging market returns during the post-liberalization period is relatively more similar to that of developed markets –just as one would expect from increasing financial and overall economic integration between emerging and developed markets after the liberalization.

To complete the description of the basic facts, table III reports the correlation coefficients between national markets and a set of benchmark portfolios. It is apparent that emerging market returns are more correlated among themselves and with the developed world in the post-liberalization period than they were in the Harvey (1995) study and the pre-liberalization period presented at the bottom of the table. While four emerging countries had a negative correlation with the world market in Harvey (1995), only India still has a

negative correlation after financial liberalization but it is –0.03 instead of –0.21. With the exception of Jordan and Nigeria, all other countries have higher correlation with the world after liberalization than they did in Harvey (1995). Moreover, the distinction with developed markets is less clear cut in the post-liberalization sample. The ten emerging countries that are more highly correlated with the world have a correlation coefficients with the world in the 33-55 percent range, while six of the 19 developed markets have correlations with the world in this range.

The third panel of table III lists the correlations between portfolios. Emerging markets taken together (be this in value weighted or equally weighted form) have a correlation with the value weighted world index of about one half, whereas the US, the UK and Japan all have a correlation coefficient with the world of about three quarters. An equally weighted portfolio of developed countries has a correlation of 0.9 with the world, something that is not surprising given that developed markets taken together amounted to at least 85 percent of the world portfolio during the period. The last two columns of table III report the correlations with the credit risk portfolios and will be analyzed below.

III.c. Credit Rating Across Countries and Over Time

The country credit ratings used here are taken from *Institutional Investor* magazine (*II*). Most leading international banks have credit analysis teams whose job is to appraise the probability of default of the bank's borrowers. *II* surveys these banks asking them to grade each country on a scale of zero to 100, with 100 representing those countries with the least chance of default. The sample for the study ranges from 75 to 100 banks, each of which provides its own ratings but is not permitted to rate their home countries. The individual responses are weighted by *II* giving more importance to responses from banks with greater worldwide exposure and more sophisticated country analysis systems (Shapiro, 1998). The survey, which currently comprises over 130 countries, is conducted twice a year and the results have been published in the March and September editions since 1979.[25]

The idea of using expert survey measures of country credit rating to sort out risks in emerging markets is not new. It was first introduced by Feder and Ross (1982) and later used in a sequence of papers by Erb, Harvey and Viskanta (1995 and 1996) and Bekaert, Erb, Harvey and Viskanta (1997) as a measure of systematic risk alternative to beta with respect to the world market index. The seminal work of Harvey (1995) had found that only one in 20 emerging markets had a beta greater than one (i.e. Portugal). As a result, the high returns on emerging markets which had small betas could not be explained by the world CAPM. These authors found empirically that country risk could substitute in sorting countries into high and low subsequent mean return groups but did not provide a theory for why this might be so.

[25] Cite Shapiro (1994) and give details on information that bank managers use to appraise each country and how it has changed over time.

Table IV reports credit rating statistics for the thirty nine countries. While the mean credit rating for the 39 countries in the sample has remained relatively stable in the low 60s, some individual countries experienced wide swings in their ratings. The overall mean rating for emerging countries was 43.4 for the whole sample and 45.3 if we focus on the post-liberalization period, while the mean rating was 81.5 for the developed countries.

Chile is the country with the largest increase in rating as it went from 24.6 in March 1986 to 61.8 in March 1999. Argentina and the Philippines are the next big winners with an average increase in credit rating of about 3 percent per semester, followed by Mexico, Zimbabwe, Portugal and Colombia in the 1-2 percent range. The big losers in the credit rating race were Nigeria, Pakistan and India all with a significantly negative coefficient in a regression on time. Among the developed countries, Hong Kong, Japan, Canada and Sweden had significantly negative time coefficients while New Zealand, Singapore and Denmark had the largest positive coefficients on time. While the mean ratings of emerging and developed markets are quite distinct, a number of emerging countries have credit ratings which overlap with those of developed ones. The maximum rating for an emerging country was 79.9 for Taiwan, while the minimum for a developed county was 61.4 for Italy, almost a 20 point difference in favor of an emerging market. The top panel in figure III plots the mean credit rating in the post-liberalization period against the average increase per semester for each country.

The middle and bottom panels of the figure plot the mean return for each country against the mean credit rating (during post-liberalization for emerging countries and during the whole sample for developed). There appears to be a mild negative relation between returns and credit rating after the liberalization (the relationship is more significant if we include data for the whole sample for all countries).

III.d. High Sovereign Risk minus Low Sovereign Risk Portfolio Returns

Previous studies found that country credit rating was instrumental in sorting stocks into portfolios with different expected returns [Erb, Harvey and Viskanta (1995) and Bekaert, Erb, Harvey and Viskanta (1997)]. This paper takes those findings one step further by asking if a portfolio that is intended to mimic for the premium associated with credit risk can reduce the mispricing and significantly improve the fit of a world CAPM. Two credit risk portfolios are constructed, a one-way sorted and a two-way sorted portfolio.

The one-way sorted portfolio results from sorting countries on credit rating and focusing on the five countries at each extreme of the ranking. An equally weighted return of the five countries at each extreme of the ranking is formed. An investment strategy that intended to exploit the credit risk premium would short one dollar of the low risk (high credit rating) portfolio and buy one dollar of the high risk (low credit rating) portfolio. In terms of the boxes presented in table V.A, this high-minus-low credit risk portfolio consists of buying the countries in the bottom right-hand corner and shorting those in the top left-hand corner.

As shown in table II and V.B, the mean return to such a strategy was 1.32% during the whole sample (*t* ratio for mean different from zero equal to 2.14). This is not the difference between 3.07 and 0.65 (the arithmetic means of the corresponding boxes of table V.A) because the returns computed in table V.A are value-weighted whereas the one way sorted portfolio uses equal weighting of the returns of the individual countries in the high-risk and low-risk portfolios.

As shown in table V.A, this portfolio tends to buy countries like Nigeria, Zimbabwe, Jordan, the Philippines and Argentina, with the proceeds of shorting countries like Switzerland, Germany, Japan and the USA. As new credit rankings come out every semester, the sorting is done again and countries are allocated to portfolios based on the top five and bottom five criteria. A country will stay in a portfolio for the next six months until the new *Institutional Investor* credit ranking comes out. The gap in mean credit rating of the low-credit and high-credit portfolio remains at about 60 credit points throughout the sample period, which happens to be the mean credit rating in the sample. So we can interpret this portfolio as having an exposure to credit risk of about minus one mean of credit rating.

Although the credit risk exposure of such a strategy is clear, it is also apparent that creditworthiness is not the only thing that changes among the countries that compose the high-risk and low-risk portfolios. Table III shows that the correlation of HML-one way sorted with an equally (value) weighted portfolios of emerging countries is 0.43 (0.14). Table II reported that returns in developed countries tend to be lower, less autocorrelated and less volatile than those in emerging countries, even after financial liberalization took place in the latter. Moreover, there is a host of institutional features that distinguish developed from emerging countries. As such, the one-way sorted credit risk portfolio could be criticized on the grounds that it is proxying for the premium associated with other variables beyond credit rating. In order to address this concern, we construct a two-way sorted portfolio that intends to capture the premium associated with credit risk in a more subtle manner. The two way sort partitions the country set into developed and emerging countries and then conducts a sort on credit within each development category. Finally the portfolio invests in the high-credit risk countries in each development category the proceeds of shorting the low-credit risk countries in each development category.

Although development status may be considered an arbitrary categorization, the literature seems to have found a focal set of twenty some countries considered developed (Ferson and Harvey, 1994, 1995, 1998, Harvey, 1991, etc.).

The two way sorted portfolio focuses on the five countries at each extreme of the credit rating sort for a given development status. Four portfolios are then formed: developed-low risk, developed-high risk, emerging-low risk and emerging high-risk. The countries composing each portfolio together with the number of months that they are in it, can be found in table V.A. Following Fama and French (1993), a value-weighted mean return for each of these four basic portfolios is formed. The two way sorted portfolio results

from subtracting the linear average of the low-risk portfolios across development categories from the linear average of returns of the high-risk portfolios across development categories. Alternatively, we are shorting the low-risk developed (i.e. countries like the US) to buy high-risk developed (i.e. New Zealand) and also shorting low-risk emerging (i.e. Taiwan) to buy high-risk emerging (i.e. Nigeria). This strategy has, again, a mean credit exposure of about minus one mean credit rating (i.e. about –62 credit points). As shown in table V.B, this strategy produces a mean return of 1.08 percent per month (*t* ratio for the mean different from zero equal to 1.96). An important issue in analyzing the costs and benefits of which credit risk mimicking portfolio to use is that the *t*-tests for mean different from zero are much higher for the two-way sorted portfolio in the 1991-99 and 1993-99 sample periods (see table V.B).

Moreover, while the one way sorted portfolio has a correlation with the world of -0.25 (*p*-value of 0.000 under the null that ρ is 0), the two way sorted portfolio has a correlation of only -0.03 (*p*-value of 0.66). So the two-way sorted portfolio has ridded itself of systematic world risk. The first sign that credit risk may matter is that such a portfolio has earned a mean risk premium of 1.08 percent per month during the thirteen years of the sample (*t* ratio for a test that the mean is zero is 1.96). The relatively lower correlation of the two-way sorted portfolio with the world portfolio is an attractive feature in that when used in a time series regression of country returns on the world index and a credit risk portfolio, the lower the correlation between the explanatory variables, the more precise will be the coefficient estimates (Greene, 1993).

IV. Empirical Models and Results

This section presents the results of testing three econometric specifications for the period in which each country is presumed to have been integrated into the world economy. As discussed above, the sample is country specific for emerging countries based on the financial liberalization dates identified by Henry (2000) and Bekaert, Harvey and Lumsdaine (1998) and it starts in April 1986 for developed countries.

The first model is a straightforward test of the international capital asset pricing model from the point of view of an investor who measures returns in U.S. dollars. Emphasis is placed in highlighting the difference between parameters estimated for the post-liberalization period and earlier results in the literature. The second model is not an asset pricing model *per se* but intends to provide an empirical test for the refutable propositions emerging from the theoretical setting of section II. The third model uses a portfolio that intends to capture for the premium associated with sovereign risk alongside the world market portfolio. The latter model produces significantly better fits and smaller mispricing coefficients.

IV.a. Tests of International CAPM

Table VI reports the estimated parameters for the one factor unconditional model

$$r_{it} = \alpha + \beta_{im} r_{mt} + e_{it} \qquad t = 1,...,T$$

using the MSCI all country index as the world portfolio benchmark and data for the post-liberalization period in each country.

For comparison, the table reports the corresponding estimated parameters as found in Harvey (1995) which were estimated since data are available from the IFC until June 1992. Note that the sample used here has a few years of overlap with the Harvey sample for countries which liberalized prior to 1992. Another caveat is that the variable used to proxy for the market portfolio is the MSCI World portfolio in Harvey (1995) which does not include emerging markets whereas this paper used the MSCI All Country World portfolio starting in 1988. The reason why we use the All Country portfolio is because theory suggests that the widest possible proxy for the market portfolio be used.

The results in table VI indicate that the post-liberalization period is indeed different from the previous period studied by Harvey (1995). Figure IV plots the results of table VI in the three panels, alpha, beta and adjusted R^2. In each panel, the Harvey results is plotted on the vertical axis, and that estimated here for the post-liberalization period is plotted on the horizontal axis. A 45 degree line is used in the three panels, so that points above the diagonal imply that Harvey's estimate was larger than that found here.

The average adjusted R^2 across the twenty emerging countries found by Harvey was 3.94 percent (median of 2 percent) and it is 9.28 percent (median of 8.51 percent) here. This is easily summarized in the bottom panel of figure IV where over three quarters of the points are below the diagonal. The horizontal and vertical lines goes through the zero point in each axis. Indonesia being below the horizontal line, it went from an adjusted R^2 of minus 2 percent to almost 19 percent. Five countries gained more than 10 percentage points in adjusted R^2 in the post-liberalization period compared to Harvey's (1995) sample.

In spite of the low R^2s Harvey had found seven alphas to be significant at the 10 percent level, and we find only one significant α. The average absolute mispricing across emerging markets found by Harvey was 1.64 percent per month and it is about half as much (87 basis points) here. The alphas are graphed in the top panel of figure IV. Again, about three quarters of the alphas are above the diagonal implying that the mispricing is smaller for a majority of countries in the post-liberalization period.

The following table summarizes that the βs found here are also much higher.

SUMMARY OF ESTIMATED βs BY RANGE AND MARKET			
Range	Emerging Markets		Developed Mkts
	Harvey (1995)	Here	Here
$\beta < 0$	3	1	0
$0 < \beta < 1/3$	8	2	8
$1/3 < \beta < 2/3$	4	5	2
$2/3 < \beta < 1$	4	4	2
$1 < \beta$	1	8	6

The median beta found by Harvey (1995) was 0.22 whereas it is 0.94 here –only one beta in Harvey's work is greater than the median beta found here. Fourteen of the twenty betas found by Harvey are lower than one half. Such low betas back the Stulz (1999) claim that in a world where the CAPM holds, the expected returns on emerging markets should be smaller than those in developed markets. However, among the 39 countries studied here there are more emerging markets with betas greater than one (i.e. eight) than there are developed markets with beta point estimates greater than one (i.e. six). The betas are plotted in the middle panel of figure IV, together with horizontal and lines going through the zero and one points along each axis. Whereas in the Harvey sample, betas cluster around 0.1 and 0.6, in the post-liberalization sample, the betas cluster revolve around 0.5 and 1.0 with a few others clustering around 1.3.

This agrees with the Bekaert, Erb, Harvey and Viskanta (1997) in that the distribution of emerging market returns is unstable and that these markets have become more integrated into world capital markets during this decade.

Hence the first contribution of this research which is to document that the results in the post-liberalization period are much more favorable to a world CAPM and that the world covariance risk embedded in emerging market securities is much larger than had previously been documented.

More importantly, there is a statistically significant negative relation between alpha and mean credit rating (table IX presents the regression results). A country that is 30 points less creditworthy pays a covariance-risk adjusted expected excess return 4.03 percentage points higher per year. The top panel of figure V plots the alphas and mean credit rating for the post-liberalization period.

Erb, Harvey and Viskanta (1995) report that during the period from March 1980 until December 1993, countries with lower world betas actually had higher mean returns and higher riskiness as measured by lower credit rating. So that world beta was not doing a good job of capturing the expected risk premium on countries with lower creditworthiness. Figure V (bottom panel) reveals that the positive relation between β and mean credit rating persists during the post-liberalization period. Of countries that are 30 credit points apart the one with higher rating will have a β that is 0.14 points higher (t ratio 1.88 and an R^2 of 9 percent). When the regression of β on mean credit rating in ran within the emerging country subgroup, the R^2 rises to 15 percent, the t-ratio drops to 1.79

but the difference in β associated with a 30 credit point difference increases to 0.34 points. The relationship is not significant within the developed country subgroup. This conclusion could be criticized on the grounds that the largest αs arise in emerging countries so that anything that is correlated with development status will be useful in order to explain the cross-sectional distribution of the αs. Separate regressions of α on mean credit rating and for emerging and developed countries are run. Among the developed countries, the negative relation between α and mean credit rating becomes insignificant. Within the emerging countries, the coefficient remains negative but the *t*-ratio drops to 1.38, implying that a country that has a 30 point lower credit grade will pay an α that is 7.2 percentage points higher per year (more details on these regressions on table IX).

Having established that there is a significant relationship between mispricing and creditworthiness across countries, the next step is to see if that relationship disappears when we use the world portfolio along with a portfolio that mimics the premium associated with credit risk.

IV.b. An Empirical Model Tailored to Capture the Effects of Sovereignty in International Equity Returns

We have argued above that international investments are a bundle of two securities. A claim on capital which earns a return as a function of its covariance with the world and a fair bet on the resolution of local policy uncertainty. The bet is fair assuming that the marginal investor holds a diversified world portfolio in which local policy risk is diversifiable.

Given the null hypothesis that returns are generated by (9) we want an empirical model that takes into account both components of the process generating returns, (*F*' and *z*). The following empirical specification is suggested

(11.a) $$r_i(t) = \beta_i\, r_w(t) + \zeta_i(t) \qquad i = 1,\ldots,N \quad t = 1,\ldots,T$$

(11.b) $$\zeta_i(t) = \alpha_i + \gamma\ p_i(t) + \delta\ \Delta p_i(t) + \varepsilon_i(t)$$

Equation (a) imposes the null hypothesis that asset returns reflect a capital asset pricing model-like feature where the price for holding worldwide risk is the return to the world portfolio and the local asset pays a premium as a function of its beta. Note that the price of beta-risk is unique across countries, namely r_w. Equation (b) intends to capture the effects on returns of the right given to the investment-host government to enact policies that affect business. One would expect this right to be sold for a price, which should be a function of the possible effects of policy.

Let $p_i(t)$ be a compound measure the willingness of the government of country i to honor contracts in period t as originally written and of its willingness to enact laws that increase the net present value of corporate dividends. In a way, p so defined is a function of the distribution of z in (9). If p is high, this means that the distribution of z collapses on $\bar{z}$ and the investor gets the marginal product of capital in every period. A low p is indicative of a high variance of z, which has the potential to give a payoff that is quite different from the marginal product of capital.

When investing in a country with lower than average p_i, one is in principle giving the host-government the option to implement potentially harmful measures. In the presence of left-skewness in the distribution of z, assets will be paying an extra return [$z - \bar{z} > 0$ in (9)] during periods in which any but the most radical government policies are implemented. It is then expected that low p_i figures be associated with large subsequent returns or a positive γcoefficient during "normal" times. Note that γ is a world-wide price which is assumed equal across countries as we assume integrated markets which force the price of risk to be the same across borders.

In realistic settings, the parameters of the distribution of z for a given country change over time in a partially predictable way so that z is neither identically nor independently distributed over time. That is, over time, a country can improve or worsen its reputation for honoring private contracts and it can become more or less business friendly. In order to account for changes in the distribution of z, we allow for changes in p to affect contemporaneous returns. If in a given period $\Delta p > 0$ we would expect a positive impact on observed returns (i.e. a positive δ).

We propose to use the creditworthiness index published by *Institutional Investor* as a proxy for p. This appears to be a homogeneous measuring stick across time and countries as discussed above. Since these figures are published only twice a year, we maintained them constant for a given semester. Combining equations (11) we obtain

$$r_i(t) = \alpha_i + \beta_i\, r_W(t) + \gamma\, CCR_i(s) + \delta\left[CCR_i(s+1) - CCR_i(s)\right] + \varepsilon_i(t) \qquad (12)$$
$$i = 1,\ldots,N,\ t = 1,\ldots,T,\quad s \le t < s+1$$

where $CCR_i(s)$ is the natural logarithm of credit rating for country i during the semester that starts in month s. The results of estimating this equation by OLS for the post-liberalization period in the 39 countries in the sample are presented in table VII.b. Taking an equally weighted average across developed and emerging countries yields the following results.

Results of Estimating Model (12) and Taking Simple Averages Across Emerging and Developed Countries

Type of Countries	Adding $CCR(s)$			Adding $CCR(s+1)$-$CCR(s)$		
	α	β	Adj.R^2	α	β	Adj.R^2
Emerging	0.3378	0.83	0.1004	0.3179	0.83	0.1006
Developed	0.3960	0.93	0.3991	0.3728	0.93	0.3995
Sovereignty Option						
γ		-0.0897			-0.0844	
t(γ)		-8.88			-8.17	
δ		n.a.			0.1050	
t(δ)					2.99	

The Adding *CCR* panel expands the CAPM to include a measure of how more creditworthy countries can pay lower returns for a given beta. The coefficient on the log of credit rating at the beginning of the semester is negative as conjectured and is more than eight standard errors from zero. That is, investors in higher rated countries are willing to hold equity even if it pays a lower return than in less creditworthy countries given the fact that there is a smaller chance that the host-government may harm them.

The point estimate suggests that if one country has a one percent higher *Institutional Investor*'s credit rating measure (i.e. 50.5 vs. 50 credit points) it will pay returns that are 10 basis points per month lower than the lower rated country. That is, investors will go down the credit rating scale by demanding higher compensation during the years in which bad policies are not implemented. If an agent in contemplating taking capital out of Switzerland (with a credit rating of 95) and into Nigeria (with a credit rating of 15), this point estimate suggests that the sovereignty premium will be in the order of 16 percent per month during good years.[26] In general, the fit is slightly better than when *CCR* is ignored, but $\hat{\alpha}$ is much larger. The fact that *CCR* is not a traded asset *per se* suggests that we should not focus on $\hat{\alpha}$ as a metric of the empirical success of an asset pricing model. The next section uses a portfolio return to proxy for the premium associated with credit risk and there the mispricings are smaller than when not controlling for sovereign exposure.

The second block of columns reports the results from the same regression, expanded to account for contemporaneous changes in *CCR*. The coefficient and significance of base month *CCR* are unaffected by this expansion. The coefficient on the contemporaneous increase in *CCR* is positive and significant as expected. Table IV reports that Nigeria had the lowest average growth in *CCR* in the sample, with an average reduction of rating in the order of 1.41 percent per semester. When coupled with $\hat{\delta}$, this means that prices of Nigerian securities fell by about 15 basis points per month on average. This fall in prices was to compensate future investors for the increased uncertainty when investing in Nigeria in light of the fact that creditworthiness was reduced during the semester.

In sum, the conjectures of the theoretical model that variables that proxy for the distribution of z are relevant for explaining observed returns are validated by the

[26] This estimate seems high under the efficient markets hypothesis for then we should expect a confiscation every six months which does not seems credible. Is it an arbitrage opportunity?

empirical tests. These results can be rationalized in an efficient markets setting only in the presence of left-skewness in the distribution of z discussed above. The next section looks at these findings applying a technology commonly used in finance.

IV.c. World Risk Factor and Sovereign Risk Factor

This section presents the results of running a two factor model in which the world portfolio is the first factor and a sovereign risk portfolio (i.e. HML) is the second factor.

The remaining output presents the results of running a two factor model. As mentioned above, two high-risk minus low-risk (HML) portfolios are constructed. One of them results from a simple ranking of countries on credit risk (HML-one way sort) and the other uses a two way sort by development status and credit rating (HML-two way sort). We first look at the effects of adding the second factor on the fit of the regression and analyze the mispricings generated by the model to see if the connection between α and credit rating still persists. Then we focus on the betas generated by the model and the implied expected returns for each country and try to address the question posed in the opening paragraph of this paper, namely if expected returns in emerging countries are higher or lower than those in developed ones.

Table VII reports the adjusted R^2s of the different models for each country as well as the p-value of an F statistic associated with testing the null that imposing the coefficient on the HML portfolio to be zero does not significantly worsen the fit of the regression. When going from the one factor to a two factor model, the mean $\overline{R}^2$ rises from 0.09 to 0.19 when HML-one way sort is used and to 0.15 when HML-two way sort is used. It is easy to see why the one-way sorted portfolio generates a better fit, as it more directly proxies for emerging market behavior since it is constructed by shorting the most creditworthy developed countries and buying emerging ones. In this case, the improvement in fit comes at the cost of weakening the pure credit risk content of HML as the one-way sorted HML will proxy for anything that explains the differential return between the world's most creditworthy and least creditworthy markets among the 39 considered here. So although the average $\overline{R}^2$ rises by a larger amount when using the HML-one way sort, it is comforting to know that the significance in improvement of R^2 as judged by the F test gives a similar answer regardless of which HML portfolio is used. Indeed, fourteen of the twenty emerging countries have a significant increase in fit at the 10 percent level. Perhaps unexpectedly, among the developed countries, eight (nine) have a significant increase in fit when using HML-one way (-two way) sort. In spite of the large number of countries with significant increase in R^2, the actual increase in adjusted R^2 is much smaller among the developed countries than among emerging countries.

Figure VI plots the $\overline{R}^2$ in the one factor and two factor models. The graph is divided by a 45 degree line. Almost all points are below this diagonal showing an $\overline{R}^2$ that is larger in the two factor model. Again, the gains are more obvious with the HML-one way sort but the credit risk content is weaker.

Table VIII reports the estimated risk adjusted excess returns (i.e. α) of the different models and their heteroskedasticity and autocorrelation consistent *t*-ratios. The coefficients for the one factor model from table VI are repeated here to facilitate the comparison. The average absolute mispricing coefficient is reduced from 87 basis points per month in the one factor model to 62 (65) in the two factor model with one way sort (two way sort). The median mispricing drops from 77 basis points to 45 under one way sort and 38 basis points per month under two way sort.

Only one α coefficient is significant at the 10 percent level in the one factor model, none in the HML-one way sort and two have a t-ratio of 1.73 in the HML-two way sort (keep in mind that the adjusted R^2s are about twice as large in the two factor models and that Harvey (1995) had found seven significant alphas in spite of an average adjusted R^2 of 0.04).

Figure VII presents the estimated alphas and their absolute *t*-statistics. As shown by Fama (1996) a multifactor time series specification amounts to testing if a linear combination of the benchmark portfolios is mean variance efficient.

The purpose of using a credit risk premium mimicking factor was to purge the mispricing coefficients of their correlation with the creditworthiness of each country. It is interesting to see how well the two factor model did this.

Table IX presents the results of regressing the estimated alphas for each country on the country's mean credit rating. When the alphas from the two factor model (one way sort) for the 39 countries considered here are regressed on mean credit rating the R^2 is below 0.0000 and it is 0.0004 when the two-way sorted HML portfolio is used. By way of comparison, the same regression using the alphas from the plain CAPM gave and R^2 of 0.11. When the regression is ran separately for emerging and developed countries, the two way sorted HML portfolio yields the best results with a 0.0058 R^2 for emerging countries and 0.0003 for developed countries.

In sum, it appears that by using the returns to portfolios that intend to mimic for sovereign risk, the cross-sectional relationship between mispricing and credit rating has evaporated.

Cross Sectional Distribution of Betas and Expected Returns

Table X presents the betas estimated in the two factor model which are plotted in figure VIII together with an iso-return map. Those betas are summarized in the following chart:

AVERAGE BETA EXPOSURE OF COUNTRY PORTFOLIOS TO WORLD INDEX AND HML PORTFOLIOS						
EQUALLY WEIGHTED PORTFOLIOS	STATISTIC OF THE BETAS	β_1			β_2	
		ONE FACTOR	TWO FACTOR		TWO FACTOR	
			One way sort	Two way sort	One way sort	Two way sort
Emerging Countries	Mean	0.82	**0.94**	0.81	0.47	0.34
	Median	**0.94**	0.96	**0.94**	0.38	0.25
Developed Countries	Mean	**0.93**	**0.93**	**0.94**	0.01	0.09
	Median	0.87	0.86	0.87	0.03	0.09

It is amazing how the different statistics of β_1 revolve around 0.94 regardless of the type of country and of the model under study! These results are in sharp contrast to previous claims in the literature [i.e. Stulz (1999) and the early work of Harvey (1995)] which seemed to suggest a very different pattern of worldwide risk exposure for emerging than for developed countries. Note that although the individual country betas do vary, a well diversified portfolio of emerging countries has about the same amount of world covariance risk than a well diversified portfolio of developed countries. This holds in spite of the fact that emerging countries never were more than 13 percent of world market cap during the period and that we are using a *value* weighted index as a world benchmark. Note also, that as pointed out by Adler and Dumas (1983) even in financially integrated markets there is no need for markets to be correlated across countries if the underlying economic structures are different.

As expected, all developed countries have significant exposure to world covariance risk. Moreover, six (ten) countries have significant exposure to the one way (two way) sorted HML portfolio (some negative and some positive). The world's largest and most creditworthy markets (i.e. the US the UK and Japan) have an exposure to the credit risk factor in the interval [-0.15,0.03] with none of the positive coefficients being significantly different from zero.

Among emerging countries, the mean exposure to the credit default factor varies between 0.47 (one way sorted HML) and 0.34 (two way sorted HML). At any rate, about 13 of the 20 emerging markets have significant exposure to the world and to the sovereign risk premium factor using either HML portfolio.

Figure VIII plots the betas of each country computed using the one way sorted HML (left panel) or the two way sorted HML (right panel) sovereign premium portfolio. The horizontal and vertical lines divide the plot in regions in which the range of the βs is delimited by zero and one. The partition allows to see that the most creditworthy countries in the world have an exposure to the credit premium that hovers around the β_2 equal zero line. Some assets can be little risky because they have a small world covariance exposure and/or because they have a small sovereign premium exposure. Some countries like Argentina and Brazil have much of both types of risk and therefore should command high expected returns during years in which any but the most harmful policies are implemented.

When using a time series decomposition of returns on factors, it is easy to compute expected returns on assets (Fama and French, 1993). The expected return on an asset that

has a unit of risk exposure to one factor and zero to the other ones is simply the time series mean return of that factor. As presented in table II, the mean returns were 72 basis points per month for the world portfolio, 132 basis points per months for the HML-one way sort portfolio, and 108 basis points per month for the HML-two way sort portfolio. So in order to compute expected returns we multiply the betas for each country by these risk premiums. For instance, the USA has a β_1 of 0.75 and β_2 of 0.01 using HML-one way sort and a β_1 of 0.74 and β_2 of 0.03 using HML-two way sort. This gives and expected returns for the US of about 56 basis points per month under either model.

The oblique lines in the bottom panels of figure VIII depict combinations of β_1 and β_2 that give the same expected return (i.e. iso-return lines) in the context of the posited multifactor linear model. For illustration, the middle iso-return line goes through the point corresponding to the betas of the United States, which has an expected return of about 56 basis points per month in excess of the US Treasury bill using either HML portfolio. A few countries have expected returns lower than that of the US. India, for instance, has a very low world beta (0.11 with one way sort and minus 0.04 with two way sort), but its credit risk exposure is about 0.3. Still, the diversification properties of Indian equities are so important that its expected returns (point estimate) are lower than those of the U.S.[27]

V. Conclusion

From the perspective of a US resident, the major risk of investing in an emerging country is the fact that assets located abroad are subject to the jurisdiction of a foreign government. The host is a sovereign authority to enact laws that affect allocation of resources and in the limit can resort to extreme measures such as confiscating local assets owned by foreigners. Moreover, to the extent that there may be conflicts among nations, beta (the traditional capital asset pricing model measure of risk) estimated during peace time may not be a sufficient measure of the risk involved when investing overseas. These facts which have been treated in the international macroeconomics literature are ignored by the international asset pricing theories that are the workhorse of financial economics. This paper adapts the model in Grossman and Van Huyck (1988) to rationalize what we believe to be the most salient feature of international investing. The empirical model developed as a result of this formulation confirmed that the data is supportive of this view.

For completeness, we also analyze more standard asset pricing tests using 20 emerging countries and 19 developed markets during the post-financial liberalization sub-period between 1986 and 1999. During this period the average emerging country has an exposure to world covariance risk in the neighborhood of 0.94 –about as much as the average developed country. This contrasts sharply with previous findings in the literature, which had documented an average beta of about one-third in emerging markets.

[27] It would be nice to construct confidence intervals around these expected returns.

However, while the average emerging country has a mean credit rating of 43 and an average standard deviation of credit rating of 5.2, the average developed country has a mean credit rating of 81 and a mean standard deviation of 2.5. Credit rating is a measure of the probability of sovereign default of a given country as measured by a survey of leading bankers, with a score of 100 indicating the lowest probability of defaults. We take this variable as a proxy one minus the probability that the government implements measures that harm businesses.

This paper asks whether this lower and more volatile creditworthiness is compensated in equity markets by higher expected returns. Indeed, we find that a portfolio that shorts high credit rating countries and buys low credit rating countries commands an average return of about 108 basis points per month in US dollars. Moreover, this portfolio is almost exempt from world covariance risk (beta of -.05 and *t*-ratio of -.43). We estimate a two-factor time series model for the returns of 20 emerging markets and 19 developed countries. We find that the fit of the model improves significantly in fourteen emerging countries and eight developed markets when allowing for a credit default factor.

Finally we compute expected returns for each country and document that expected returns according to the postulated two factor model tend to be higher in emerging markets due to their exposure to the sovereign premium.

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Table I: WORLD MARKET CAPITALIZATION AND EMERGING MARKETS						
Country	Market Capitalization		Gross	Share of	Regression on Time	
	Apr-86	Mar-99	Growth	World Cap	Slope	p-value
EMERGING COUNTRIES						
ARGENTIN	2,100	41,212	19.6	0.18%	2.69%	0.00
BRAZIL	29,087	105,626	3.6	0.46%	2.02%	0.00
CHILE	2,050	56,867	27.7	0.25%	2.28%	0.00
COLOMBIA	654	8,486	13.0	0.04%	2.13%	0.00
GREECE	417	73,844	177.0	0.32%	2.17%	0.00
INDIA	11,519	95,224	8.3	0.41%	1.85%	0.00
INDONESI	.	15,379	.	0.07%	1.44%	0.00
JORDAN	2,049	6,812	3.3	0.03%	0.86%	0.00
MALAYSIA	10,479	59,780	5.7	0.26%	1.66%	0.00
MEXICO	2,318	132,200	57.0	0.57%	2.28%	0.00
NIGERIA	2,508	2,685	1.1	0.01%	1.02%	0.00
PAKISTAN	936	4,222	4.5	0.02%	1.75%	0.00
PHILIPPI	673	35,898	53.4	0.16%	2.43%	0.00
PORTUGAL	321	47,281	147.1	0.20%	1.99%	0.00
SOUTHKOR	5,761	109,166	19.0	0.47%	1.34%	0.00
TAIWAN	6,806	228,950	33.6	0.99%	1.57%	0.00
THAILAND	1,594	25,134	15.8	0.11%	2.06%	0.00
TURKEY	.	39,548	.	0.17%	2.50%	0.00
VENEZUEL	948	5,760	6.1	0.02%	1.25%	0.00
ZIMBABWE	263	1,367	5.2	0.01%	1.31%	0.00
EMERGING TOTAL	80,483	1,095,441	13.6	4.73%		
DEVELOPED COUNTRIES						
AUSTRIA	90,674	274,677	3.0	1.19%	0.67%	0.00
AUSTRALI	2,220	25,018	11.3	0.11%	1.54%	0.00
BELGIUM	21,217	186,444	8.8	0.81%	1.08%	0.00
CANADA	108,805	423,321	3.9	1.83%	0.76%	0.00
DENMARK	10,885	76,308	7.0	0.33%	1.25%	0.00
FRANCE	113,841	822,635	7.2	3.55%	1.17%	0.00
GERMANY	214,657	868,510	4.0	3.75%	0.90%	0.00
HONGKONG	28,954	229,663	7.9	0.99%	1.53%	0.00
ITALY	104,249	485,256	4.7	2.10%	0.74%	0.00
JAPAN	1,256,190	2,233,916	1.8	9.65%	0.09%	0.02
NETHERLA	56,300	552,910	9.8	2.39%	1.36%	0.00
NEWZEALA	.	21,372	.	0.09%	0.86%	0.00
NORWAY	2,578	30,801	11.9	0.13%	1.88%	0.00
SINGAPOR	4,482	43,305	9.7	0.19%	1.63%	0.00
SPAIN	31,616	286,973	9.1	1.24%	1.09%	0.00
SWEDEN	11,446	254,058	22.2	1.10%	2.18%	0.00
SWITZERL	59,290	661,277	11.2	2.86%	1.69%	0.00
UNITEDKI	465,193	2,363,801	5.1	10.21%	0.89%	0.00
UNITEDST	1,869,163	12,214,179	6.5	52.76%	1.10%	0.00
DEVELOPED TOTAL	4,451,760	22,054,424	5.0	95.27%		
WORLD TOTAL	4,532,243	23,149,865	5.1	100.00%		
Market capitalization measured in millions of current US dollars.						
Share of world capitalization measured as of March 1999.						
Slope is the regression slope coefficient of log Mkt Cap on time measured in months.						

TABLE II: NATIONAL EQUITY MARKET EXCESS RETURNS - DESCRIPTIVE STATISTICS

COUNTRY	HARVEY (1995) RESULTS			LIBERALIZ	N	ARITH.	STD.	GEOM.	SKEW-	KUR-	NORMALITY TESTS p		PARTIAL AUTOCORRELATION COEF.		
	SAMPLE	MEAN	STD.DEV	DATE		MEAN	DEV.	MEAN	NESS	TOSIS	Jarque-Bera	Shapiro-W	LAG 1	LAG 2	LAG 12
EMERGING COUNTRIES						**POSTLIBERALIZATION SAMPLE**									
ARGENTIN	Feb-76.Jun-92	5.98%	30.33%	Nov-89	114	2.03%	15.65%	0.90%	1.75	12.57	0.00	0.00	0.03	0.02	-0.09
BRAZIL	Feb-76.Jun-92	1.81%	17.52%	Mar-88	134	2.80%	18.14%	1.14%	0.20	1.28	0.00	0.00	-0.01	-0.06	0.10
CHILE	Feb-76.Jun-92	3.30%	11.44%	May-87	144	1.80%	8.33%	1.46%	-0.03	0.44	0.00	0.58	0.24 ***	-0.16	0.02
COLOMBIA	Feb-85.Jun-92	3.84%	9.39%	Dec-91	89	1.02%	10.03%	0.55%	0.97	2.12	0.00	0.00	0.30 ***	-0.21	-0.09
GREECE	Feb-76.Jun-92	0.79%	10.46%	Aug-90	105	0.64%	9.53%	0.21%	0.68	1.76	0.00	0.02	0.09	0.03	0.05
INDIA	Feb-76.Jun-92	1.70%	7.67%	Jun-86	155	0.24%	9.42%	-0.19%	0.66	1.00	0.00	0.13	0.11	0.05	-0.16
INDONESI	Feb-90.Jun-92	-0.95%	9.82%	Nov-91	90	0.32%	14.95%	-0.81%	0.33	3.24	0.40	0.00	0.21 **	-0.28 **	-0.14
JORDAN	Feb-79.Jun-92	0.86%	5.20%	Feb-82	157	0.17%	4.47%	0.07%	0.19	1.26	0.00	0.06	-0.07	-0.10	0.18
MALAYSIA	Feb-85.Jun-92	1.10%	7.76%	May-87	144	0.31%	11.01%	-0.28%	0.71	5.06	0.00	0.00	0.08	0.14 *	-0.03
MEXICO	Feb-76.Jun-92	2.54%	12.99%	May-89	120	1.55%	10.15%	1.00%	-1.04	2.24	0.00	0.00	0.18 *	0.02	-0.04
NIGERIA	Feb-85.Jun-92	0.20%	10.74%	Apr-93	73	2.71%	17.09%	1.20%	1.92	19.09	0.00	0.00	0.00	0.05	0.04
PAKISTAN	Feb-85.Jun-92	2.16%	6.46%	Dec-93	65	-1.04%	11.71%	-1.73%	0.29	2.07	0.20	0.04	-0.06	0.02	-0.11
PHILIPPI	Feb-85.Jun-92	4.16%	11.15%	May-86	156	1.76%	11.56%	1.12%	0.69	2.65	0.00	0.00	0.30 ***	-0.04	0.06
PORTUGAL	Feb-86.Jun-92	3.39%	14.85%	Jan-88	135	0.41%	6.95%	0.18%	0.57	1.68	0.00	0.18	0.03	0.01	-0.14
SOUTHKOR	Feb-76.Jun-92	1.54%	9.06%	Jun-87	143	0.51%	12.38%	-0.20%	1.47	7.40	0.00	0.00	0.03	-0.02	-0.10
TAIWAN	Feb-85.Jun-92	3.41%	15.59%	May-86	156	1.80%	13.96%	0.87%	0.59	1.87	0.00	0.00	0.07	0.01	0.06
THAILAND	Feb-76.Jun-92	1.81%	7.41%	Jan-88	136	0.65%	12.42%	-0.11%	0.40	2.10	0.02	0.00	0.20 ***	0.03	0.13
TURKEY	Mar-87.Jun-92	3.69%	22.01%	Aug-90	105	0.64%	17.27%	-0.78%	0.72	1.27	0.00	0.02	0.05	0.05	-0.16
VENEZUEL	Feb-85.Jun-92	3.17%	13.72%	Jan-90	112	2.15%	15.29%	0.97%	0.10	1.36	0.00	0.38	0.05	0.17 *	-0.03
ZIMBABWE	Feb-76.Jun-92	0.81%	9.89%	Oct-84	157	0.68%	10.02%	0.14%	-0.82	3.07	0.00	0.00	0.28 ***	0.11 **	-0.07
DEVELOPED COUNTRIES						**ALLSAMPLE**									
AUSTRALI				Apr-86	157	0.84%	6.93%	0.57%	-1.88	11.25	0.00	0.00	-0.02	-0.07	-0.15
AUSTRIA				Apr-86	157	0.53%	7.24%	0.27%	0.17	1.67	0.00	0.25	0.01	-0.11	0.01
BELGIUM				Apr-86	157	1.14%	5.02%	1.02%	0.14	3.75	0.12	0.43	0.04	-0.01	-0.02
CANADA				Apr-86	157	0.50%	4.95%	0.38%	-1.03	4.51	0.00	0.00	0.05	-0.03	-0.14
DENMARK				Apr-86	157	0.88%	5.54%	0.73%	0.24	0.59	0.00	0.80	-0.16 **	-0.09	-0.01
FRANCE				Apr-86	157	0.89%	6.03%	0.70%	-0.18	0.79	0.00	0.93	-0.09	-0.16	-0.13
GERMANY				Apr-86	157	0.72%	6.24%	0.52%	-0.41	1.47	0.00	0.01	-0.12	-0.10	-0.02
HONGKONG				Apr-86	157	1.59%	9.16%	1.15%	-0.58	4.54	0.00	0.00	0.02	-0.03	-0.13
CNTY				Apr-86	ARHO_T	DINT	DINT_T	DRHO	DRHO_T;	0.01	0.00	0.72	-0.15 *	-0.12	0.07
JAPAN				Apr-86	157	0.27%	7.49%	-0.01%	0.29	0.29	0.00	0.68	0.05	-0.07	-0.05
NETHERLA				Apr-86	157	1.19%	4.62%	1.08%	-0.67	1.48	0.00	0.20	-0.11	-0.06	0.00
NEWZEALA				Apr-86	136	0.24%	6.99%	0.00%	0.51	1.58	0.00	0.63	-0.05	-0.07	-0.14
NORWAY				Apr-86	157	0.65%	7.44%	0.36%	-0.71	1.62	0.00	0.00	0.03	-0.07	-0.03
SINGAPOR				Apr-86	157	1.01%	8.32%	0.65%	-0.61	4.99	0.00	0.00	0.03	0.02	-0.08
SPAIN				Apr-86	157	1.13%	6.88%	0.89%	-0.24	1.13	0.00	0.50	0.00	-0.17	0.00
SWEDEN				Apr-86	157	1.24%	6.64%	1.01%	-0.41	0.65	0.00	0.61	0.01	-0.12	0.01
SWITZERL				Apr-86	157	1.05%	5.40%	0.90%	-0.27	1.31	0.00	0.37	-0.05	-0.13	-0.03
UNITEDKI				Apr-86	157	0.94%	5.33%	0.79%	-0.35	1.53	0.00	0.73	-0.07	-0.10	-0.15
UNITEDST				Apr-86	157	1.03%	4.26%	0.94%	-1.06	5.57	0.00	0.00	-0.02	-0.06	-0.07

COUNTRY	HARVEY (1995) RESULTS			LIBERALIZ	N	ARITH.	STD.	GEOM.	SKEW-	KUR-	NORMALITY TESTS p		PARTIAL AUTOCORRELATION COEF.					
	SAMPLE	MEAN	STD.DEV	DATE		MEAN	DEV.	MEAN	NESS	TOSIS	Jarque-Bera	Shapiro-W	LAG 1		LAG 2		LAG 12	
PORTFOLIOS						**ALLSAMPLE**												
COMPOSIT				Apr-86	157	0.53%	6.91%	0.29%	-0.68	2.02	0.00	0.02	0.16	**	0.07		0.03	
EQWP_DEV				Apr-86	157	0.87%	4.42%	0.77%	-1.20	4.94	0.00	.	-0.02		-0.12		-0.08	
EQWP_EMR				Apr-86	157	1.49%	5.41%	1.34%	-0.65	2.69	0.00	.	0.27	***	0.01		0.09	
HIMILOONE				Apr-86	157	1.32%	7.74%	1.03%	0.00	0.52	0.00	.	0.07		0.13		-0.11	
HIMILOTWO				Apr-86	157	1.08%	6.87%	0.84%	0.19	0.12	0.00	.	-0.03		0.09		0.06	
WORLD				Apr-86	157	0.72%	4.24%	0.63%	-0.79	2.56	0.00	0.00	0.00		-0.08		0.02	
The postliberalization sample begins on the liberalization date and ends in April 1999. The allsample begins in April 1986 and ends in April 1999.																		
All returns unhedged in US$ in excess of the one month US Treasury bill.																		
P-VALUES: *<10%, **<5%, ***<1%																		
Portfolios																		
COMPOSIT	Value-weighted portfolio of emerging countries																	
EQWP_DEV	Equally weighted portfolio of developed countries																	
EQWP_EMR	Equally weighted portfolio of emerging countries																	
HIMILOONE	One way sorte High-Credit Risk Minus Low-Credit Risk portfolio - one way sort - taking 5 countries at each extreme																	
HIMILOTWO	Two way sorted High-Credit Risk Minus Low-Credit Risk portfolio - one way sort - taking 5 countries at each extreme																	
WORLD	MSCI All country world portfolio from January 1988, MSCI World portfolio before then.																	
The values from Harvey pertain to total returns, not excess returns as the rest of the values in the table. I will work in converting Harvey's values to their excess return equivalents.																		

TABLE III: CORRELATION BETWEEN NATIONAL MARKETS AND BENCHMARK INDICES								
COUNTRY	EMERGING		USA	DEVELOP	WORLD		HML	
	Value W	Equal.W		Equal.W	HARVEY	POSTLIB	ONE WAY	TWO WAY
EMERGING COUNTRIES - POSTLIBERALIZATION								
ARGENTIN	0.28	0.42	0.35	0.27	-0.06	0.27	0.41	0.42
BRAZIL	0.45	0.46	0.21	0.28	0.18	0.31	0.33	0.62
CHILE	0.59	0.59	0.36	0.35	0.14	0.30	0.26	0.20
COLOMBIA	0.31	0.45	0.08	0.19	0.08	0.14	0.49	0.31
GREECE	0.36	0.46	0.32	0.47	0.15	0.39	0.02	0.13
INDIA	0.22	0.32	-0.04	0.04	-0.21	-0.03	0.29	dev
INDONESI	0.64	0.72	0.45	0.55	0.07	0.46	0.29	0.29
JORDAN	0.07	0.07	0.04	0.14	0.13	0.13	-0.04	0.01
MALAYSIA	0.58	0.62	0.40	0.54	0.55	0.51	0.05	-0.02
MEXICO	0.60	0.56	0.32	0.43	0.33	0.43	0.21	0.18
NIGERIA	0.07	0.20	0.00	0.09	0.11	0.07	0.56	0.35
PAKISTAN	0.38	0.47	0.10	0.08	0.02	0.17	0.53	0.26
PHILIPPI	0.43	0.57	0.29	0.48	0.31	0.39	0.18	0.18
PORTUGAL	0.22	0.40	0.36	0.61	0.40	0.53	-0.09	0.21
SOUTHKOR	0.35	0.37	0.26	0.28	0.33	0.34	0.00	-0.15
TAIWAN	0.77	0.47	0.17	0.31	0.21	0.31	-0.01	-0.37
THAILAND	0.55	0.64	0.40	0.50	0.41	0.43	0.09	-0.04
TURKEY	0.25	0.35	0.08	0.18	0.05	0.12	-0.01	0.06
VENEZUEL	0.15	0.39	0.02	0.10	-0.10	0.06	0.35	0.23
ZIMBABWE	0.17	0.34	0.06	0.13	-0.02	0.15	0.22	0.00
DEVELOPED COUNTRIES - ALLSAMPLE(=POSTLIBERALIZATION)								
AUSTRIA	0.37	0.38	0.17	0.58		0.35	-0.10	0.10
AUSTRALI	0.45	0.44	0.49	0.66		0.54	-0.08	0.04
BELGIUM	0.24	0.27	0.48	0.70		0.65	-0.33	0.01
CANADA	0.47	0.53	0.76	0.73		0.70	-0.06	0.05
DENMARK	0.14	0.29	0.35	0.63		0.54	-0.10	0.17
FRANCE	0.28	0.31	0.50	0.75		0.68	-0.28	0.08
GERMANY	0.27	0.28	0.41	0.75		0.59	-0.31	0.08
HONGKONG	0.55	0.55	0.49	0.66		0.55	-0.07	0.12
ITALY	0.23	0.30	0.28	0.57		0.48	-0.07	0.10
JAPAN	0.24	0.29	0.27	0.56		0.76	-0.21	-0.17
NETHERLA	0.32	0.42	0.61	0.83		0.76	-0.26	0.12
NEWZEALA	0.30	0.41	0.33	0.59		0.46	0.01	0.11
NORWAY	0.45	0.47	0.56	0.74		0.63	-0.09	0.09
SINGAPOR	0.63	0.65	0.57	0.69		0.64	-0.05	-0.04
SPAIN	0.33	0.45	0.47	0.77		0.69	-0.07	0.24
SWEDEN	0.39	0.42	0.46	0.74		0.65	-0.13	0.12
SWITZERL	0.25	0.34	0.53	0.75		0.68	-0.28	0.09
UNITEDKI	0.32	0.34	0.62	0.79		0.76	-0.32	0.01
UNITEDST	0.40	0.42	1.00	0.69		0.74	-0.16	0.02

COUNTRY	EMERGING		USA	DEVELOP	WORLD		HML	
	Value W	Equal.W		Equal.W	HARVEY	POSTLIB	ONE WAY	TWO WAY
PORTFOLIOS - ALLSAMPLE(=POSTLIBERALIZATION)								
EMER-Val-W	1.00	0.77	0.40	0.53		0.49	0.14	-0.08
EMER-Eq-W	0.77	1.00	0.42	0.59		0.52	0.43	0.23
DEVL-Eq-W	0.53	0.59	0.69	1.00		0.90	-0.21	0.10
WORLD	0.49	0.52	0.74	0.90		1.00	-0.25	-0.03
HML-one	0.14	0.43	-0.16	-0.21		-0.25	1.00	0.58
HML-two	-0.08	0.23	0.02	0.10		-0.03	0.58	1.00
EMERGING COUNTRIES - PRELIBERALIZATION								
ARGENTIN	0.05	0.44	0.00	0.01		-0.12	0.64	0.11
BRAZIL	0.45	0.23	0.02	0.18		-0.01	0.00	0.08
CHILE	-0.17	0.14	-0.39	-0.27		-0.29	0.65	0.56
COLOMBIA	0.05	0.26	0.14	0.10		0.08	-0.02	0.08
GREECE	0.02	0.42	0.17	0.16		0.14	0.12	0.15
INDIA	0.99	-0.65	-0.53	0.24		-0.43	0.31	0.80
INDONESI	0.25	0.52	0.19	0.33		0.06	-0.21	-0.13
JORDAN	0.07	0.07	0.04	0.14		0.13	-0.04	0.01
MALAYSIA	0.28	0.01	0.53	0.01		0.14	-0.35	-0.56
MEXICO	0.56	0.66	0.54	0.36		0.43	-0.17	-0.22
NIGERIA	-0.11	0.15	0.04	0.07		0.10	0.34	0.20
PAKISTAN	0.09	0.23	0.00	0.10		0.02	0.05	0.07
PHILIPPI	-1.00	-1.00	1.00	-1.00		-1.00	1.00	-1.00
PORTUGAL	0.67	0.68	0.32	0.33		0.35	-0.38	-0.57
SOUTHKOR	-0.29	-0.16	-0.02	-0.50		-0.15	0.24	-0.06
TAIWAN	-1.00	-1.00	1.00	-1.00		-1.00	1.00	-1.00
THAILAND	0.72	0.69	0.46	0.60		0.49	-0.26	-0.16
TURKEY	0.34	0.64	0.07	0.19		0.12	0.28	0.15
VENEZUEL	-0.20	0.01	0.08	0.01		0.07	-0.08	-0.16
Countries that have only one observation in the preliberalization period, will show correlations=-1 in that period								

TABLE IV: NATIONAL CREDIT RATING STATISTICS AND SLOPE ON TIME							
COUNTRY	POSTLIB.	ALLSAMPLE STATISTICS				REGRESS. ON TIME	
	MEAN	MEAN	STD.DEV.	MINIMUM	MAXIMUM	Slope	p-value
EMERGING COUNTRIES							
ARGENTIN	32.9	30.1	8.7	18.3	42.7	3.12%	0.00
BRAZIL	31.6	31.9	4.6	26.5	39.5	0.96%	0.00
CHILE	47.7	45.2	14.0	24.6	63.5	4.14%	0.00
COLOMBIA	44.0	40.9	4.7	31.8	47.7	1.08%	0.00
GREECE	50.0	49.2	2.6	45.7	56.1	0.51%	0.00
INDIA	44.9	45.1	4.2	37.5	50.7	-0.42%	0.07
INDONESI	48.6	47.5	5.9	27.9	52.4	-0.13%	0.73
JORDAN	29.9	29.9	6.5	20.7	38.7	-0.26%	0.65
MALAYSIA	62.2	61.9	5.1	51.0	69.1	0.48%	0.02
MEXICO	41.8	38.7	6.9	27.1	46.9	1.98%	0.00
NIGERIA	16.8	18.5	2.5	14.8	24.0	-1.41%	0.00
PAKISTAN	27.8	28.8	2.3	20.4	31.2	-0.62%	0.00
PHILIPPI	30.8	30.4	8.1	18.6	44.3	3.14%	0.00
PORTUGAL	66.3	64.2	6.8	50.4	76.1	1.32%	0.00
SOUTHKOR	67.0	66.1	5.6	52.7	72.2	0.22%	0.34
TAIWAN	77.2	77.0	1.8	72.6	79.9	0.12%	0.03
THAILAND	59.5	58.6	4.9	46.9	63.8	0.04%	0.85
TURKEY	41.5	41.0	2.4	36.9	45.6	-0.07%	0.65
VENEZUEL	35.1	35.4	2.7	30.1	39.8	-0.28%	0.15
ZIMBABWE	27.7	27.7	3.8	20.0	33.8	1.48%	0.00
MEAN	44.2	43.4	5.2			0.77%	
STD.DEV.	15.9	15.5	2.9				
DEVELOPED COUNTRIES							
AUSTRALI	71.3	71.3	3.4	66.6	80.1	-0.08%	0.49
AUSTRIA	85.0	85	1.6	82.9	88.8	0.21%	0.00
BELGIUM	79.3	79.3	1.9	75.8	83.5	0.26%	0.00
CANADA	83.4	83.4	2.5	79.4	88.1	-0.29%	0.00
DENMARK	76.4	76.4	4.4	71.7	84.7	0.65%	0.00
FRANCE	87.1	87.1	2.0	82.7	90.8	0.27%	0.00
GERMANY	91.9	91.9	1.6	89.4	94.2	-0.12%	0.00
HONGKONG	66.2	66.2	2.4	61.4	69.7	-0.37%	0.00
ITALY	76.2	76.2	2.7	72.0	80.1	-0.17%	0.06
JAPAN	92.5	92.5	2.4	86.5	95.9	-0.29%	0.00
NETHERLA	88.4	88.4	1.5	85.8	91.9	0.20%	0.00
NEWZEALA	67.1	67.1	3.8	61.7	73.7	0.45%	0.00
NORWAY	81.1	81.1	3.6	76.0	88.2	0.21%	0.05
SINGAPOR	79.4	79.4	3.4	73.8	84.2	0.50%	0.00
SPAIN	74.8	74.8	2.5	69.0	80.3	0.26%	0.00
SWEDEN	77.6	77.6	2.6	74.1	81.4	-0.26%	0.00
SWITZERL	93.0	93	1.0	91.5	95.3	-0.10%	0.00
UNITEDKI	87.1	87.1	1.7	83.7	90.9	0.11%	0.02
UNITEDST	90.7	90.7	2.3	87.0	96.4	-0.05%	0.39
MEAN	81.5	81.5	2.5			0.07%	
STD.DEV.	8.3	8.3	0.9				
Slope is the regression slope coefficient of log credit rating on time measured in semesters.							

TABLE V.A: CREDIT RISK PORTFOLIOS

Development Status	Credit Rating Category						High Minus Low Risk
	Low Risk (i.e. High Credit Rating)			High Risk (i.e. Low Credit Rating)			
Developed	Mean Credit Rating	Arithmetic Mean Ret	Geometric Mean Ret	Mean Credit Rating	Arithmetic Mean Ret	Geometric Mean Ret	Arithmetic Mean Ret
	91.72	0.65%	0.54%	70.8	1.14%	0.95%	0.49%
	Countries			Countries			
	SWI(157)	USA(145)	FRA(20)	HON(157)	SPA(119)	SWE(44)	
	GER(157)	NET(116)		NEW(157)	DEN(83)	SIN(12)	
	JAP(149)	UKI(35)		ASL(140)	ITA(74)	BEL(5)	
Emerging	Mean Credit Rating	Arithmetic Mean Ret	Geometric Mean Ret	Mean Credit Rating	Arithmetic Mean Ret	Geometric Mean Ret	
	69.2	1.41%	1.04%	27.0	3.07%	2.48%	1.66%
	Countries			Countries			
	POR(157)	THA(131)	GRE(8)	NIG(157)	PHI(89)	PAK(68)	
	TAI(157)	SOU(151)		ZIM(133)	ARG(83)	VEN(50)	
	MAL(155)	CHI(26)		JOR(96)	BRA(72)	CHI(29)	
						IDO(8)	
Average return for each type of risk		1.03%			2.11%		1.08%

Returns are percent per month in excess of th US Treasury Bill. The number in brackets beside the country code is the number of months that each country was part of a portfolio.

TABLE V.B: MEAN OF CREDIT RISK (HML) PORTFOLIOS AND CORRELATIONS WITH WORLD FOR DIFFERENT PERIODS

TYPE OF SORT	PERIOD					
	1986-1999		1991-1999		1993-1999	
	MEAN	ρ	MEAN	ρ	MEAN	ρ
ONE WAY	1.32%	-0.27	0.83%	-0.13	0.32%	-0.06
	t=2.14	p=0.0006	t=1:2	p=0.16	t=0.40	p=0.60
TWO WAY	1.08%	-0.03	1.34%	-0.01	0.91%	-0.005
	t=1.96	p=0.66	t=2.24	p=0.88	t=1.59	p=0.99

TABLE VI: RESULTS OF UNCONDITIONAL ONE FACTOR MODEL																
COUNTRY	HARVEY (1995)							POSTLIBERALIZATION								INCREASE
	α	t(α)		β	t(β)		Adj.R^2	α	t(α)		β	t(β)		Adj.R^2	in Adj.R^2
EMERGING COUNTRIES																
ARGENTIN	0.0529	2.40	***	-0.17	-0.40		-0.00	0.0146	0.96		1.00	2.77	***	0.0591	0.0591
BRAZIL	0.0089	0.73		0.39	1.20		0.00	0.0198	1.33		1.40	3.48	***	0.0877	0.0877
CHILE	0.0247	2.94	***	0.17	0.81		-0.00	0.0149	2.22	**	0.59	2.84	***	0.0825	0.0825
COLOMBIA	0.0311	3.01	***	0.15	0.80		-0.01	0.0055	0.54		0.55	1.54		0.0276	0.0376
GREECE	-0.0013	-0.18		0.38	2.09	**	0.02	0.0000	0.00		0.96	4.08	***	0.1529	0.1329
INDIA	0.0096	1.73	*	-0.05	-0.41		-0.00	0.0028	0.36		-0.06	-0.33		-0.0059	-0.0059
INDONESI	-0.0139	-0.78		0.21	0.51		-0.02	-0.0115	-0.83		1.84	3.96	***	0.1880	0.2080
JORDAN	-0.0002	-0.06		0.17	1.67	*	0.02	0.0006	0.18		0.14	1.48		0.0116	-0.0084
MALAYSIA	-0.0007	-0.09		0.74	3.51	***	0.20	-0.0038	-0.50		1.32	6.59	***	0.2490	0.0490
MEXICO	0.0147	1.60		0.79	3.18	***	0.06	0.0098	1.11		1.02	4.72	***	0.1647	0.1047
NIGERIA	-0.0058	-0.49		0.23	1.05		0.00	0.0225	1.51		0.48	0.76		-0.0031	-0.0031
PAKISTAN	0.0150	2.14	**	0.05	0.37		-0.01	-0.0166	-1.20		0.65	1.39		0.0286	0.0386
ARHO	0.0297	2.58	***	0.76	2.75	***	0.09	0.0101	1.19		1.05	4.24	***	0.1443	0.0543
PORTUGAL	0.0223	1.44		1.20	4.84	***	0.15	-0.0015	-0.31		0.92	8.08	***	0.2733	0.1233
SOUTHKOR	0.0058	0.93		0.51	3.55	***	0.05	-0.0001	-0.01		0.99	4.58	***	0.1079	0.0579
TAIWAN	0.0226	1.34		0.71	1.67	*	0.04	0.0109	1.01		1.00	3.44	***	0.0878	0.0478
THAILAND	0.0089	1.63		0.40	2.06	**	0.05	-0.0021	-0.22		1.34	5.01	***	0.1797	0.1297
TURKEY	0.0308	1.13		0.10	0.22		-0.02	0.0026	0.15		0.57	1.28		0.0077	0.0277
VENEZUEL	0.0285	1.86	*	-0.38	-1.12		0.01	0.0201	1.29		0.26	0.51		-0.0042	-0.0142
ZIMBABWE	-0.0004	-0.05		0.21	1.11		0.00	0.0042	0.49		0.36	1.34		0.0170	0.0170
MEAN #	0.0164			0.33			0.0394	0.0087			0.82			0.0928	0.0613
MEDIAN #	0.0143			0.22			0.0200	0.0077			0.94			0.0851	0.0517
DEVELOPED COUNTRIES								ALLSAMPLE							
AUSTRALI								0.0020	0.38		0.88	4.14	***	0.2877	
AUSTRIA								0.0010	0.17		0.60	3.98	***	0.1197	
BELGIUM								0.0058	1.91	*	0.77	9.10	***	0.4230	
CANADA								-0.0009	-0.31		0.82	8.50	***	0.4934	
DENMARK								0.0037	1.00		0.70	8.25	***	0.2858	
FRANCE								0.0019	0.53		0.97	13.80	***	0.4617	

COUNTRY	HARVEY (1995)					POSTLIBERALIZATION					INCREASE
	α	t(α)	β	t(β)	Adj.R^2	α	t(α)	β	t(β)	Adj.R^2	in Adj.R^2
GERMANY						0.0010	0.24	0.86	7.27 ***	0.3423	
HONGKONG						0.0073	1.13	1.18	5.44 ***	0.2954	
ITALY						-0.0011	-0.21	0.84	7.81 ***	0.2270	
JAPAN						-0.0070	-1.70 *	1.33	9.71 ***	0.5692	
NETHERLA						0.0059	2.44 ***	0.83	13.30 ***	0.5748	
NEWZEALA						-0.0027	-0.52	0.80	5.80 ***	0.2033	
NORWAY						-0.0015	-0.31	1.10	8.17 ***	0.3919	
SINGAPOR						0.0011	0.21	1.25	7.39 ***	0.4003	
SPAIN						0.0031	0.81	1.13	12.80 ***	0.4793	
SWEDEN						0.0050	1.29	1.02	8.98 ***	0.4223	
SWITZERL						0.0042	1.33	0.87	11.20 ***	0.4600	
UNITEDKI						0.0024	0.86	0.96	13.30 ***	0.5773	
UNITEDST						0.0050	2.03 **	0.74	8.62 ***	0.5417	
MEAN #						0.0033		0.93		0.40	
MEDIAN #						0.0027		0.87		0.42	
PORTFOLIOS						ALLSAMPLE					
COMPOSIT						-0.0004	-0.09	0.80	5.01 ***	0.2353	
EQWP_DEV						0.0019	1.17	0.93	17.20 ***	0.7998	
EQWP_EMR						0.0101	2.63 ***	0.66	5.84 ***	0.2631	
HIMILO5						0.0166	2.83 ***	-0.46	-3.00 ***	0.0580	
HIMILOTW						0.0112	2.09 **	-0.06	-0.50	-0.0052	

For the coefficient α, the reported mean and median are those of the absolute value of α.

Note that some countries liberalized very early in the sample so that allsample and postliberalization estimates are quite similar (see table 1 for Libdates)

Market portfolio proxied by the MSCI All country world index. Returns are unhedged and measured in US$ in excess of one month T.Bill.

t-ratios are autocorrelation and heteroskedasticity consistent. Associated p-values are highlighted by stars when p-value: *<10%, **<5%, ***<1%

Portfolios	
COMPOSIT	Value-weighted portfolio of emerging countries
EQWP_DEV	Equally weighted portfolio of developed countries
EQWP_EMR	Equally weighted portfolio of emerging countries
HIMILO5	One way sorte High-Credit Risk Minus Low-Credit Risk portfolio - one way sort - taking 5 countries at each extreme
HIMILOTW	Two way sorted High-Credit Risk Minus Low-Credit Risk portfolio - one way sort - taking 5 countries at each extreme

Table VI.b.: CAPM Estimates Controlling for Credit Risk

Countries	Adding Credit Rating at Beginning of Semester					Adding Increase in Credit Rating at During Semester				
	γ	t(γ)	δ	t(δ)		γ	t(γ)	δ	t(δ)	
Option	-0.0897	-8.88 ***	n.a.			-0.0844	-8.17 ***	0.1050	2.99 ***	
	α	t(α)	β	t(β)	Adj.R^2	α	t(α)	β	t(β)	Adj.R^2
Emerging Economies										
ARGENTINA	0.3211	8.60 ***	1.09	3.12 ***	0.0751	0.2986	7.78 ***	1.08	3.10 ***	0.073
BRAZIL	0.3277	8.67 ***	1.43	3.81 ***	0.0992	0.3086	7.99 ***	1.42	3.80 ***	0.0964
CHILE	0.3557	9.13 ***	0.65	4.16 ***	0.1120	0.3319	8.29 ***	0.65	4.15 ***	0.1099
COLOMBIA	0.3440	8.70 ***	0.55	1.91 *	0.0627	0.3229	7.98 ***	0.55	1.92 *	0.0665
GREECE	0.3503	8.67 ***	0.97	4.44 ***	0.1320	0.3287	7.95 ***	0.96	4.41 ***	0.1373
INDIA	0.3438	8.78 ***	-0.05	-0.30	0.0000	0.3243	8.11 ***	-0.06	-0.32	-0.0083
INDONESIA	0.3385	8.07 ***	1.76	4.52 ***	0.2124	0.3225	7.58 ***	1.73	4.44 ***	0.2115
JORDAN	0.3022	8.84 ***	0.18	2.06 **	-0.0808	0.2846	8.15 ***	0.18	2.05 **	-0.1119
MALAYSIA	0.3665	8.63 ***	1.32	7.04 ***	0.2634	0.3452	7.96 ***	1.33	7.09 ***	0.2651
MEXICO	0.3425	8.92 ***	1.06	5.21 ***	0.1952	0.3205	8.14 ***	1.06	5.21 ***	0.1876
NIGERIA	0.2747	7.79 ***	0.49	0.89	-0.0270	0.2611	7.30 ***	0.50	0.90	-0.0359
PAKISTAN	0.2833	7.69 ***	0.61	1.61	0.0399	0.2688	7.20 ***	0.64	1.67 *	0.0456
PHILIPPINES	0.3128	8.91 ***	1.06	5.40 ***	0.1901	0.2918	8.09 ***	1.05	5.38 ***	0.1957
PORTUGAL	0.3736	8.78 ***	0.93	7.06 ***	0.2387	0.3501	8.03 ***	0.93	7.05 ***	0.2394
SOUTHKOREA	0.3772	8.65 ***	0.98	4.27 ***	0.1351	0.3556	7.99 ***	0.97	4.26 ***	0.1449
TAIWAN	0.4006	8.86 ***	1.00	3.98 ***	0.0902	0.3776	8.18 ***	1.00	3.99 ***	0.0907
THAILAND	0.3647	8.60 ***	1.32	5.48 ***	0.1918	0.3439	7.95 ***	1.32	5.52 ***	0.2049
TURKEY	0.3371	8.15 ***	0.56	1.33	0.0072	0.3180	7.55 ***	0.56	1.33	0.0049
VENEZUELA	0.3389	8.76 ***	0.27	0.76	0.0235	0.3198	8.11 ***	0.26	0.76	0.0369
ZIMBABWE	0.3016	8.76 ***	0.34	1.86 *	0.0487	0.2834	8.05 ***	0.35	1.92 *	0.0571
Mean #	0.3378		0.83		0.1004	0.3179		0.83		0.1006
Median #	0.3407		0.95		0.0947	0.3215		0.94		0.0936
Developed Economies										
AUSTRALIA	0.3843	8.87 ***	0.90	8.07 ***	0.2798	0.3621	8.18 ***	0.90	8.00 ***	0.2686
AUSTRIA	0.3994	8.84 ***	0.60	4.74 ***	0.1242	0.3757	8.13 ***	0.61	4.75 ***	0.1266
BELGIUM	0.3979	8.99 ***	0.77	10.80 ***	0.4278	0.3745	8.27 ***	0.77	10.83 ***	0.4294
CANADA	0.3958	8.84 ***	0.82	12.38 ***	0.4936	0.3728	8.14 ***	0.82	12.35 ***	0.4914
DENMARK	0.3922	8.93 ***	0.71	8.06 ***	0.2868	0.3689	8.21 ***	0.71	8.08 ***	0.2884
FRANCE	0.4024	8.89 ***	0.97	11.59 ***	0.4617	0.3785	8.18 ***	0.97	11.59 ***	0.4626
GERMANY	0.4064	8.87 ***	0.87	9.08 ***	0.3431	0.3827	8.16 ***	0.87	9.10 ***	0.3454
HONGKONG	0.3834	8.96 ***	1.18	8.14 ***	0.2943	0.3618	8.27 ***	1.18	8.11 ***	0.294
ITALY	0.3875	8.79 ***	0.83	6.83 ***	0.2283	0.3645	8.09 ***	0.83	6.84 ***	0.23
JAPAN	0.3992	8.69 ***	1.33	14.30 ***	0.5650	0.3758	8.01 ***	1.33	14.31 ***	0.5661
NETHERLANDS	0.4079	9.00 ***	0.83	14.60 ***	0.5743	0.3841	8.28 ***	0.83	14.65 ***	0.5758
NORWAY	0.3924	8.80 ***	1.11	10.23 ***	0.3990	0.3692	8.10 ***	1.11	10.26 ***	04
SINGAPORE	0.3933	8.84 ***	1.25	10.35 ***	0.4094	0.3700	8.13 ***	1.25	10.36 ***	0.4081
SPAIN	0.3900	8.91 ***	1.12	12.02 ***	0.4820	0.3667	8.19 ***	1.12	12.04 ***	0.4835
SWEDEN	0.3952	8.95 ***	1.02	10.71 ***	0.4235	0.3722	8.25 ***	1.02	10.72 ***	0.4247
SWITZERLAND	0.4108	8.95 ***	0.87	11.60 ***	0.4617	0.3870	8.25 ***	0.87	11.61 ***	0.4609
UNITEDKINGDOM	0.4029	8.92 ***	0.96	14.67 ***	0.5760	0.3793	8.21 ***	0.96	14.71 ***	0.5762
NEWZEALAND	0.3740	8.75 ***	0.81	6.06 ***	0.2092	0.3513	8.03 ***	0.81	6.07 ***	0.2146
UNITEDSTATES	0.4091	8.98 ***	0.74	13.72 ***	0.5431	0.3856	8.28 ***	0.74	13.69 ***	0.5441
Mean #	0.3960		0.93		0.3991	0.3728		0.93		0.3995
Median #	0.3958		0.87		0.4235	0.3728		0.87		0.4247

For the coefficient α, the reported mean and median are those of the absolute value of α.

Market portfolio proxied by the MSCI All country world index. Returns are unhedged and measured in US$ in excess of one month T.Bill.

p-values are highlighted by stars when p-value: *<10%, **<5%, ***<1%

TABLE VII: FIT OF ONE FACTOR AND TWO FACTOR UNCONDITIONAL MODELS AND STEP DOWN F-TEST							
COUNTRY	POSTLIBERALIZATION						
	ONE FACTOR	TWO FACTORS					
		HML ONE WAY SORT			HML TWO WAY SORT		
	Adj. R^2	Adj. R^2	P-VALUE F-TEST		Adj. R^2	P-VALUE F-TEST	
EMERGING COUNTRIES							
ARGENTIN	0.0591	0.2690	0.000	***	0.2363	0.000	***
BRAZIL	0.0877	0.2453	0.000	***	0.4547	0.000	***
CHILE	0.0825	0.1954	0.000	***	0.1179	0.011	**
COLOMBIA	0.0276	0.2821	0.000	***	0.1477	0.000	***
GREECE	0.1529	0.1488	0.480		0.1583	0.200	
INDIA	-0.0059	0.0748	0.000	***	0.0302	0.011	**
INDONESI	0.1880	0.2660	0.002	***	0.2448	0.007	***
JORDAN	0.0116	0.0051	0.978		0.0054	0.829	
MALAYSIA	0.2490	0.2755	0.014	**	0.2441	0.784	
MEXICO	0.1647	0.2497	0.000	***	0.1803	0.074	*
NIGERIA	-0.0031	0.3291	0.000	***	0.0883	0.006	***
PAKISTAN	0.0286	0.3062	0.000	***	0.0568	0.095	*
PHILIPPI	0.1443	0.2200	0.000	***	0.1755	0.010	***
PORTUGAL	0.2733	0.2698	0.552		0.3175	0.002	***
SOUTHKOR	0.1079	0.1091	0.279		0.1240	0.060	*
TAIWAN	0.0878	0.0866	0.375		0.2108	0.000	***
THAILAND	0.1797	0.2125	0.011	**	0.1746	0.677	
TURKEY	0.0077	-0.0020	0.966		0.0010	0.581	
VENEZUEL	-0.0042	0.1273	0.000	***	0.0452	0.011	**
ZIMBABWE	0.0170	0.0825	0.001	***	0.0106	0.982	
MEAN	0.0928	0.1876			0.1512		
MEDIAN	0.0851	0.2163			0.1530		
DEVELOPED COUNTRIES							
AUSTRIA	0.1197	0.1141	0.895		0.1275	0.124	
AUSTRALI	0.2877	0.2869	0.368		0.2862	0.412	
BELGIUM	0.4230	0.4471	0.006	***	0.4204	0.577	
CANADA	0.4934	0.5042	0.038	**	0.4965	0.165	
DENMARK	0.2858	0.2829	0.540		0.3171	0.005	***
FRANCE	0.4617	0.4716	0.050	**	0.4693	0.075	*
GERMANY	0.3423	0.3669	0.009	***	0.3486	0.115	
HONGKONG	0.2954	0.2959	0.296		0.3105	0.038	dev
ITALY	0.2270	0.2251	0.434		0.2348	0.111	
JAPAN	0.5692	0.5668	0.700		0.5863	0.007	***
NETHERLA	0.5748	0.5771	0.175		0.5924	0.006	***
NEWZEALA	0.2033	0.2115	0.125		0.2124	0.113	
NORWAY	0.3919	0.3927	0.275		0.4003	0.077	*
SINGAPOR	0.4003	0.4098	0.064	*	0.3967	0.789	
SPAIN	0.4793	0.4880	0.058	*	0.5450	0.000	***
SWEDEN	0.4223	0.4195	0.607		0.4398	0.017	**
SWITZERL	0.4600	0.4692	0.057	*	0.4695	0.053	*
UNITEDKI	0.5773	0.5914	0.013	**	0.5756	0.539	

COUNTRY	POSTLIBERALIZATION						
	ONE	TWO FACTORS					
	FACTOR	HML ONE WAY SORT			HML TWO WAY SORT		
	Adj. R^2	Adj. R^2	P-VALUE F-TEST		Adj. R^2	P-VALUE F-TEST	
UNITEDST	0.5417	0.5394	0.636		0.5409	0.388	
MEAN	0.3977	0.4032			0.4089		
MEDIAN	0.4223	0.4195			0.4204		
PORTFOLIOS							
COMPOSIT	0.2353	0.3047	0.000	***	0.2348	0.348	
EQWP_DEV	0.7998	0.7986	0.718		0.8162	0.000	***
EQWP_EMR	0.2631	0.6012	0.000	***	0.3192	0.000	***
HML portfolios are zero investment portfolios resulting from shortin countries with good credit ratings (low risk) and buying countries with low credit ratings (high risk).							
In the two way sorted portfolios, a sort is first done on development status --see text for details.							
*: p-value smaller than 10%, **: p-value smaller than 5%, ***: p-value smaller than 1%							
Note that some countries liberalized very early in the sample so that allsample and postliberalization estimates are quite similar (see table 1 for Libdates)							
Market portfolio proxied by the MSCI All country world index. Returns are unhedged and measured in US$ in excess of one month T.Bill.							
Portfolios							
COMPOSIT	Value-weighted portfolio of emerging countries						
EQWP_DEV	Equally weighted portfolio of developed countries						
EQWP_EMR	Equally weighted portfolio of emerging countries						

TABLE VIII: MISPRICING IN UNCONDITIONAL MODELS - ONE FACTOR Vs. TWO FACTOR (HML ONE WAY AND TWO WAY SORTED)									
COUNTRY	POSTLIBERALIZATION								
	ONE FACTOR MODEL			TWO FACTOR MODELS					
				HML ONE WAY SORTED			HML TWO WAY SORTED		
	α	t(α)		α	t(α)		α	t(α)	
EMERGING COUNTRIES									
ARGENTIN	0.0146	0.96		0.0061	0.49		0.0008	0.06	
BRAZIL	0.0198	1.33		0.0044	0.35		-0.0034	-0.29	
CHILE	0.0149	2.22	**	0.0086	1.33		0.0117	1.73	*
COLOMBIA	0.0055	0.54		0.0027	0.30		-0.0006	-0.06	
GREECE	0.0000	0.00		-0.0008	-0.09		-0.0021	-0.24	
INDIA	0.0028	0.36		-0.0031	-0.41		-0.0003	-0.04	
INDONESI	-0.0115	-0.83		-0.0134	-1.02		-0.0175	-1.30	
JORDAN	0.0006	0.18		0.0007	0.18		0.0005	0.14	
MALAYSIA	-0.0038	-0.50		-0.0081	-1.08		-0.0034	-0.43	
MEXICO	0.0098	1.11		0.0045	0.53		0.0067	0.72	
NIGERIA	0.0225	1.51		0.0143	1.09		0.0117	0.79	
PAKISTAN	-0.0166	-1.24		-0.0175	-1.51		-0.0201	-1.57	
PHILIPPI	0.0101	1.19		0.0029	0.36		0.0067	0.81	
PORTUGAL	-0.0015	-0.31		-0.0021	-0.45		-0.0044	-0.93	
SOUTHKOR	-0.0001	-0.01		-0.0025	-0.24		0.0034	0.33	
TAIWAN	0.0109	1.01		0.0088	0.78		0.0185	1.73	*
THAILAND	-0.0021	-0.22		-0.0071	-0.73		-0.0013	-0.13	
TURKEY	0.0026	0.15		0.0025	0.14		0.0008	0.04	
VENEZUEL	0.0201	1.29		0.0126	0.84		0.0123	0.77	
ZIMBABWE	0.0042	0.49		-0.0017	-0.20		0.0042	0.48	
	0.0087			0.0062			0.0065		
	0.0077			0.0045			0.0038		
DEVELOPED COUNTRIES									
AUSTRIA	0.0010	0.17		0.0011	0.19		-0.0004	-0.07	
AUSTRALI	0.0020	0.38		0.0011	0.20		0.0014	0.25	
BELGIUM	0.0058	1.91	*	0.0077	2.44	***	0.0055	1.72	*
CANADA	-0.0009	-0.31		-0.0022	-0.71		-0.0016	-0.50	
DENMARK	0.0037	1.00		0.0032	0.88		0.0020	dev	CNTY
FRANCE	0.0019	0.53		0.0034	0.96		0.0008	0.23	
GERMANY	0.0010	0.24		0.0033	0.80		-0.0001	-0.02	
HONGKONG	0.0073	1.13		0.0059	0.88		0.0052	0.78	
ITALY	-0.0011	-0.21		-0.0020	-0.37		-0.0024	-0.45	
JAPAN	-0.0070	-1.69	*	-0.0066	-1.56		-0.0053	-1.24	
NETHERLA	0.0059	2.44	***	0.0067	2.65	***	0.0049	1.96	*
NEWZEALA	-0.0027	-0.52		-0.0044	-0.84		-0.0044	-0.78	
NORWAY	-0.0015	-0.31		-0.0026	-0.51		-0.0028	-0.58	
SINGAPOR	0.0011	0.21		-0.0010	-0.17		0.0013	0.24	
SPAIN	0.0031	0.81		0.0015	0.37		0.0002	0.06	
SWEDEN	0.0050	1.29		0.0045	1.16		0.0034	0.88	
SWITZERL	0.0042	1.33		0.0055	1.82	*	0.0032	0.98	
UNITEDKI	0.0024	0.86		0.0040	1.42		0.0022	0.74	

COUNTRY	POSTLIBERALIZATION								
	ONE FACTOR MODEL			TWO FACTOR MODELS					
				HML ONE WAY SORTED			HML TWO WAY SORTED		
	α	t(α)		α	t(α)		α	t(α)	
UNITEDST	0.0050	2.03	**	0.0047	1.88	*	0.0047	1.78	*
MEAN #	0.0033			0.0038			0.0027		
MEDIAN #	0.0027			0.0034			0.0024		
PORTFOLIOS									
COMPOSIT	-0.0004	-0.09		-0.0046	-0.90		0.0003	0.06	
EQWP_DEV	0.0019	1.17		0.0018	1.06		0.0010	0.59	
EQWP_EMR	0.0101	2.63	***	0.0032	0.99		0.0080	2.05	**
# For the coefficient α, the reported mean and median are those of the absolute value of α.									
HML portfolios are zero investment portfolios resulting from shortin countries with good credit ratings (low risk) and buying countries with low credit ratings (high risk).									
In the two way sorted portfolios, a sort is first done on development status --see text for details.									
t-ratios are autocorrelation and heteroskedasticity consistent. Associated p-values are highlighted by stars when p-value: *<10%, **<5%, ***<1%									
Note that some countries liberalized very early in the sample so that allsample and postliberalization estimates are quite similar (see table 1 for Libdates)									
Market portfolio proxied by the MSCI All country world index. Returns are unhedged and measured in US$ in excess of one month T.Bill.									
Portfolios									
COMPOSIT	Value-weighted portfolio of emerging countries								
EQWP_DEV	Equally weighted portfolio of developed countries								
EQWP_EMR	Equally weighted portfolio of emerging countries								

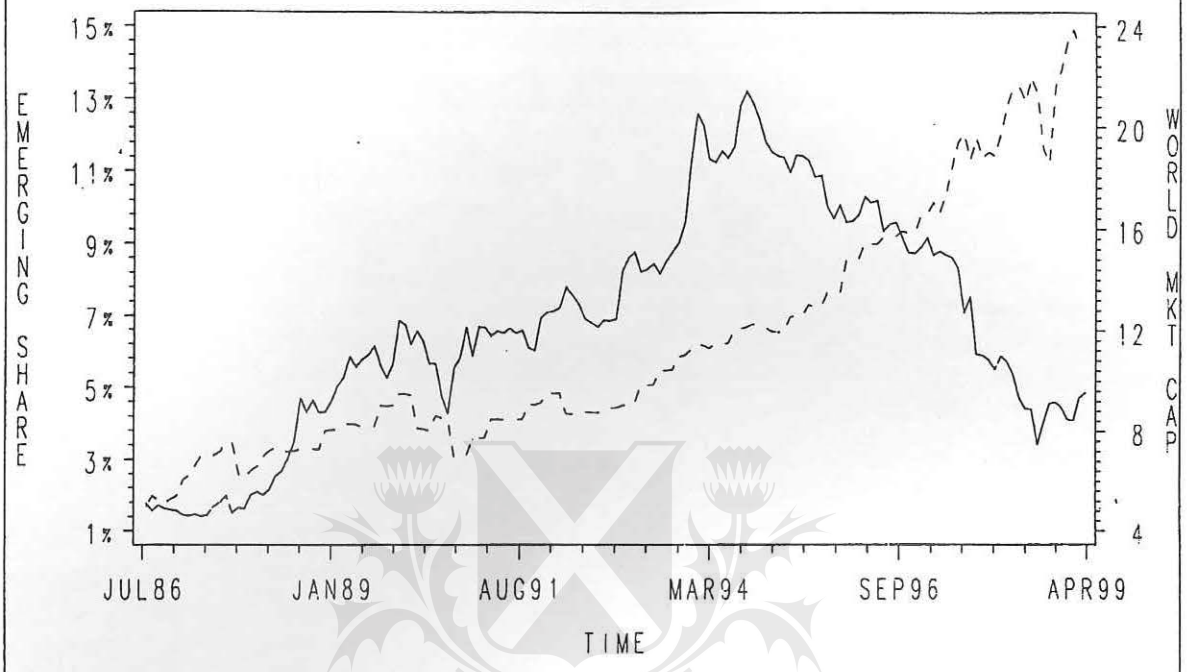
TABLE IX: IS ALPHA RELATED TO MEAN COUNTRY CREDIT RATING? (RESULTS OF REGRESSING ALPHA FOR EACH MODEL AND PERIOD ON MEAN CCR)					
SAMPLE	FACTORS	HML SORTING	DIFFERENCE IN α PER YEAR FOR 30 CREDIT POINTS	t (SLOPE)	R^2
ALL COUNTRIES	WORLD	--	-4.03%	-2.09	0.1055
	WORLD + HML	ONE WAY	0.04%	0.02	0.0000
	WORLD + HML	TWO WAY	0.23%	0.13	0.0004
EMERGING	WORLD	--	-7.20%	-1.38	0.0952
COUNTRIES	WORLD + HML	ONE WAY	-3.64%	-0.86	0.0399
	WORLD + HML	TWO WAY	1.60%	0.32	0.0058
DEVELOPED	WORLD	--	-1.97%	-0.54	0.0169
COUNTRIES	WORLD + HML	ONE WAY	2.03%	0.49	0.0139
	WORLD + HML	TWO WAY	0.25%	0.08	0.0003
The sample for emerging countries is the postliberalization sample. For developed countries it is the whole period since April 1986 until April 1999. The all countries sample, combines these two subsamples.					

TABLE X: BETAS IN UNCONDITIONAL TWO FACTOR MODELS (HML ONE WAY AND TWO WAY SORTED)													
COUNTRY	HML ONE WAY SORT							HML TWO WAY SORT					
	β_1	$t(\beta_1)$		β_2	$t(\beta_2)$			β_1	$t(\beta_1)$		β_2	$t(\beta_2)$	
EMERGING COUNTRIES - POSTLIBERALIZATION													
ARGENTIN	1.25	3.96	***	1.00	2.98	***		1.03	2.95	***	1.05	3.29	***
BRAZIL	1.83	5.89	***	0.95	3.82	***		1.43	4.45	***	1.63	9.10	***
CHILE	0.76	4.07	***	0.38	4.55	***		0.59	2.89	***	0.25	2.76	***
COLOMBIA	0.59	2.09	**	0.76	5.28	***		0.51	1.49		0.67	2.77	***
GREECE	0.98	4.25	***	0.09	0.64			0.95	4.18	***	0.18	1.14	
INDIA	0.11	0.65		0.37	4.12	***		-0.04	-0.23		0.28	2.76	***
INDONESI	1.86	3.76	***	0.65	2.66	***		1.78	4.00	***	0.71	2.71	***
JORDAN	0.14	1.49		0.00	-0.02			0.14	1.48		0.01	0.21	
MALAYSIA	1.44	6.55	***	0.26	2.00	**		1.32	6.60	***	-0.03	-0.27	
MEXICO	1.17	5.51	***	0.39	3.75	***		1.02	4.59	***	0.24	1.78	*
NIGERIA	0.57	1.16		1.42	2.73	***		0.44	0.78		1.10	1.58	
PAKISTAN	0.66	1.47		0.88	4.06	***		0.62	1.35		0.47	1.72	*
PHILIPPI	1.25	5.03	***	0.44	3.46	***		1.07	4.37	***	0.32	2.39	***
PORTUGAL	0.94	7.86	***	0.04	0.44			0.93	8.98	***	0.23	2.83	***
SOUTHKOR	1.06	4.79	***	0.14	1.08			0.99	4.68	***	-0.27	-1.91	*
TAIWAN	1.06	3.63	***	0.13	0.96			0.96	3.25	***	-0.73	-4.24	***
THAILAND	1.49	5.33	***	0.32	2.35	***		1.34	4.98	***	-0.06	-0.44	
TURKEY	0.57	1.26		0.01	0.04			0.57	1.26		0.15	0.63	
VENEZUEL	0.45	0.86		0.79	3.52	***		0.27	0.52		0.58	2.70	***
ZIMBABWE	0.53	1.89	*	0.36	3.17	***		0.36	1.34		0.00	0.03	
MEAN	0.94			0.47				0.81			0.34		
MEDIAN	0.96			0.38				0.94			0.25		
DEVELOPED COUNTRIES - ALLSAMPLE													
AUSTRIA	0.60	3.70	***	-0.01	-0.13			0.61	4.00	***	0.12	1.46	
AUSTRALI	0.91	4.25	***	0.06	1.03			0.89	4.18	***	0.06	0.83	
BELGIUM	0.72	8.47	***	-0.11	-2.50	***		0.77	9.15	***	0.02	0.56	
CANADA	0.86	8.82	***	0.08	2.06	**		0.83	8.64	***	0.06	1.27	
DENMARK	0.72	8.14	***	0.03	0.52			0.71	8.13	***	0.15	3.04	***
FRANCE	0.93	13.74	***	-0.09	-1.99	**		0.97	13.90	***	0.09	1.82	*
GERMANY	0.80	6.52	***	-0.14	-2.18	**		0.87	7.30	***	0.09	1.68	*
HONGKONG	1.22	5.33	***	0.09	0.93			1.19	5.59	***	0.19	2.21	**
ITALY	0.86	7.52	***	0.05	0.81			0.84	7.85	***	0.12	1.88	*
JAPAN	1.32	9.39	***	-0.02	-0.37			1.33	9.91	***	-0.15	-2.73	***
NETHERLA	0.81	12.68	***	-0.04	-1.38			0.83	13.57	***	0.10	2.73	***
NEWZEALA	0.85	6.74	***	0.11	1.55			0.81	6.04	***	0.13	1.61	
NORWAY	1.13	8.08	***	0.07	1.06			1.11	8.35	***	0.12	1.55	
SINGAPOR	1.31	7.32	***	0.13	1.61			1.25	7.34	***	-0.02	-0.27	
SPAIN	1.17	14.14	***	0.10	2.23	**		1.14	13.60	***	0.26	4.64	***
SWEDEN	1.03	8.26	***	0.03	0.51			1.03	9.26	***	0.14	2.53	***
SWITZERL	0.83	10.64	***	-0.08	-1.47			0.87	11.42	***	0.09	2.39	***
UNITEDKI	0.91	13.51	***	-0.09	-2.92	***		0.96	13.39	***	0.02	0.60	
UNITEDST	0.75	8.64	***	0.01	0.46			0.74	8.73	***	0.03	0.79	
MEAN	0.93			0.01				0.93			0.09		
MEDIAN	0.86			0.03				0.87			0.09		

COUNTRY	HML ONE WAY SORT						HML TWO WAY SORT					
	β_1	$t(\beta_1)$		β_2	$t(\beta_2)$		β_1	$t(\beta_1)$		β_2	$t(\beta_2)$	
PORTFOLIOS - ALLSAMPLE												
COMPOSIT	0.91	5.89	***	0.25	3.57	***	0.79	4.95	***	-0.07	-0.84	
EQWP_DEV	0.93	16.67	***	0.01	0.36		0.94	17.93	***	0.09	3.83	***
EQWP_EMR	0.85	9.39	***	0.42	10.19	***	0.67	6.06	***	0.19	3.66	***
HML portfolios are zero investment portfolios resulting from shortin countries with good credit ratings (low risk) and buying countries with low credit ratings (high risk).												
In the two way sorted portfolios, a sort is first done on development status --see text for details.												
t-ratios are autocorrelation and heteroskedasticity consistent. Associated p-values are highlighted by stars when p-value: *<10%, **<5%, ***<1%												
Note that some countries liberalized very early in the sample so that allsample and postliberalization estimates are quite similar (see table 1 for Libdates)												
Market portfolio proxied by the MSCI All country world index. Returns are unhedged and measured in US$ in excess of one month T.Bill.												
Portfolios												
COMPOSIT	Value-weighted portfolio of emerging countries											
EQWP_DEV	Equally weighted portfolio of developed countries											
EQWP_EMR	Equally weighted portfolio of emerging countries											

Fig. I.A: WORLD EQUITY CAPITALIZATION AND EMERGING MARKET SHARE

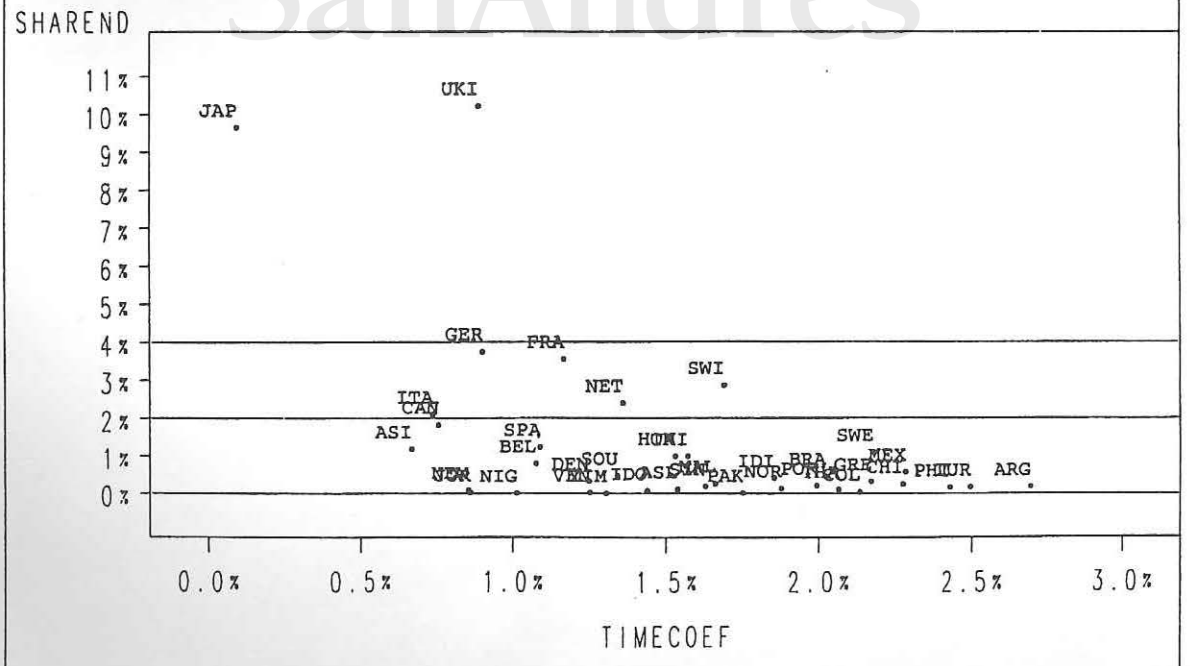
(world cap in trillions of US$)



SOLID LINE = EMERGING MARKET SHARE ¦ BROKEN LINE = TOTAL WORLD CAP

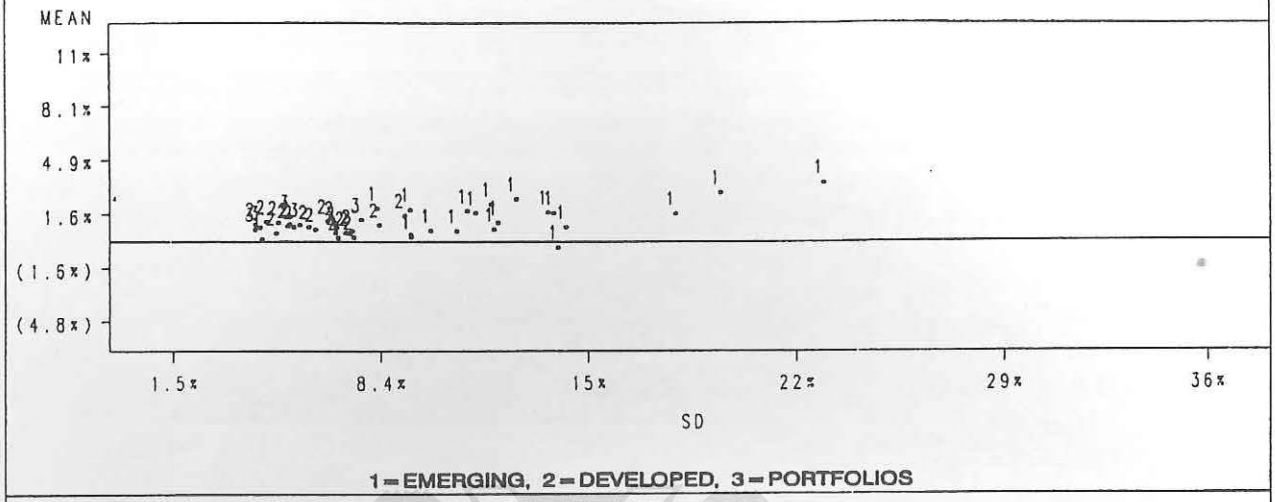
Fig. I.B: COUNTRY SHARE OF WORLD CAP IN APR-94 AND GROWTH OVER TIME

(USA: SHAREND = 53%, TIMECOEF = 1.1%)



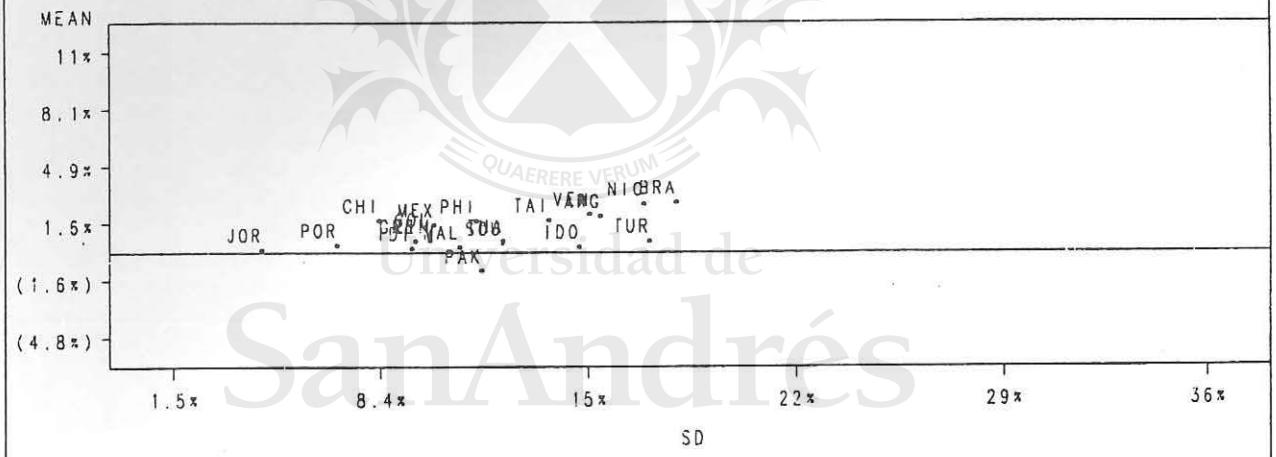
TIMECOEF is average percentage monthly increase in country cap.

Fig. II: MEAN AND STD.DEV. OF EXCESS RETURN
ALLSAMPL



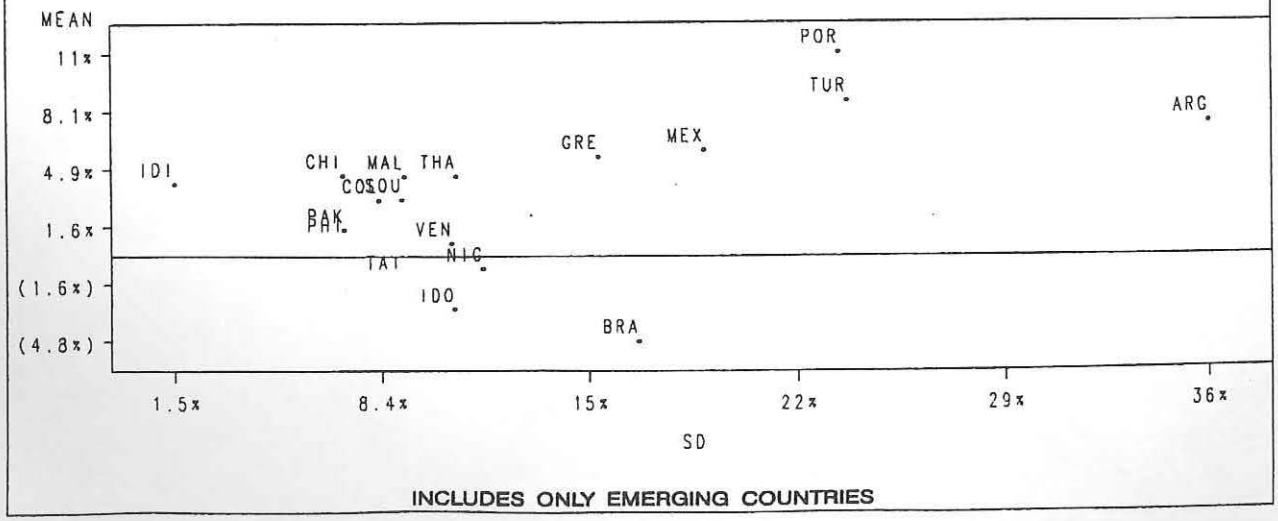
1=EMERGING, 2=DEVELOPED, 3=PORTFOLIOS

POSTLIB



INCLUDES ONLY EMERGING COUNTRIES

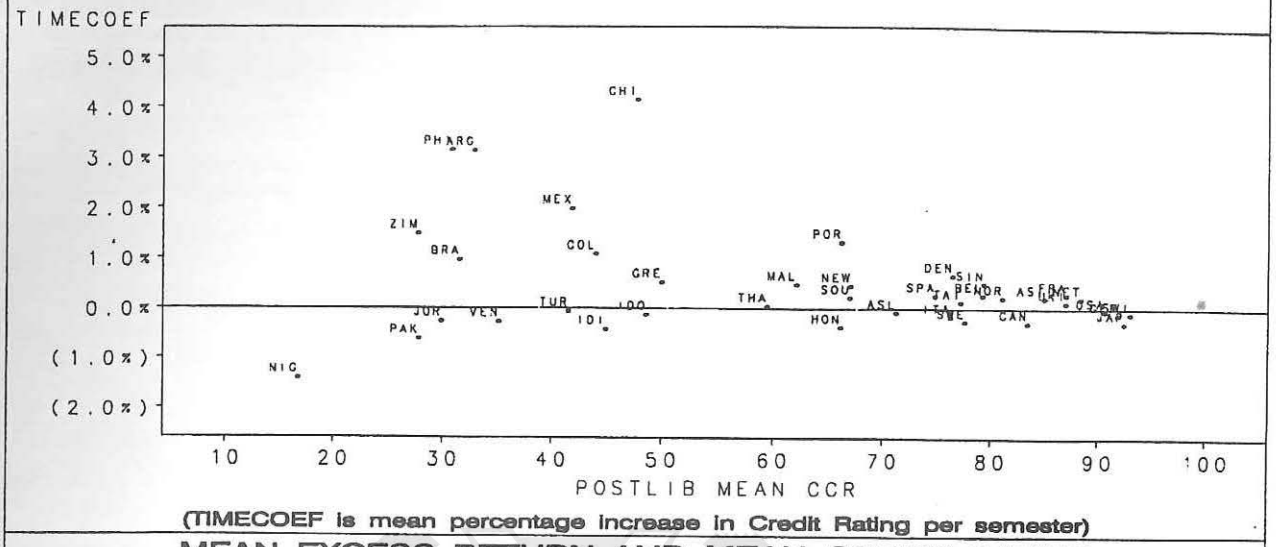
PRELIB



INCLUDES ONLY EMERGING COUNTRIES

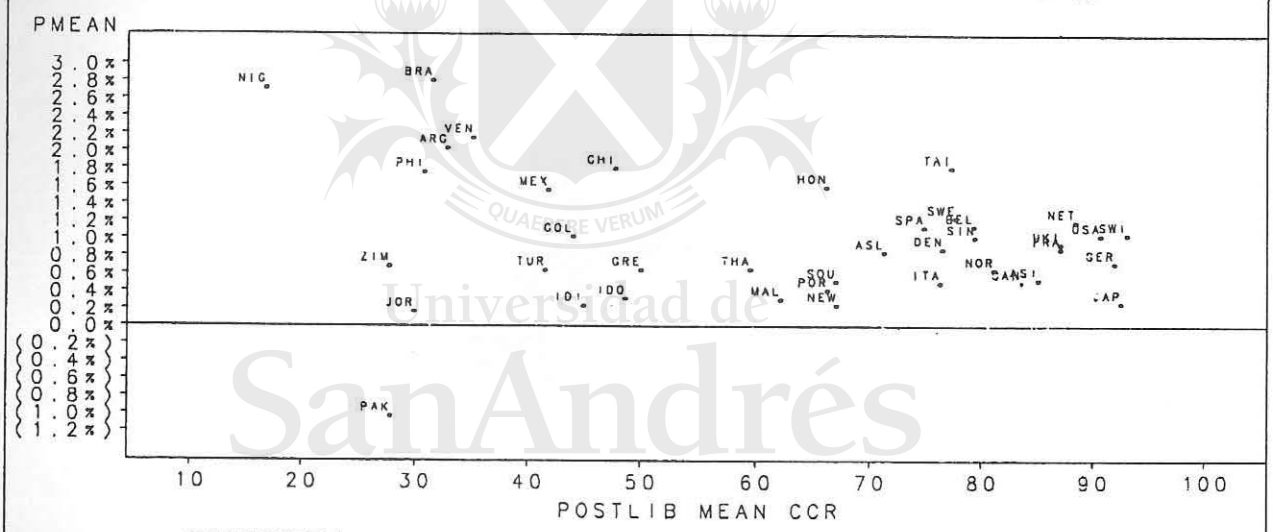
Fig. III.: MEAN CREDIT RATING — POST—LIBERALIZATION

MEAN CCR AND INCREASE PER SEMESTER



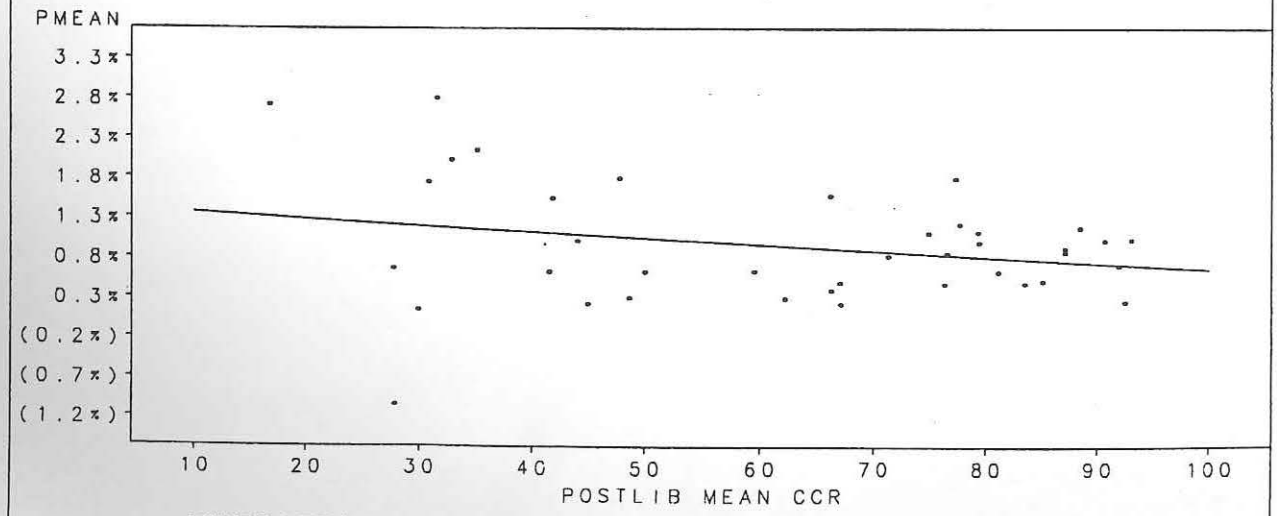
(TIMECOEF is mean percentage increase in Credit Rating per semester)

MEAN EXCESS RETURN AND MEAN CREDIT RATING



(TIMECOEF is mean percentage increase in Credit Rating per semester)

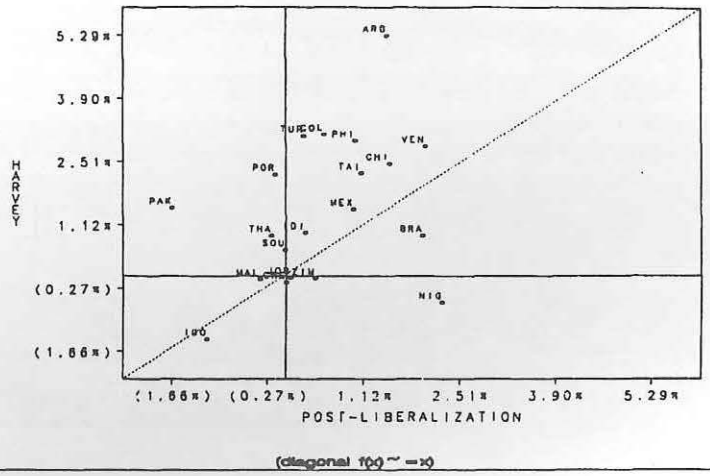
BEST FITTING LINE



(TIMECOEF is mean percentage increase in Credit Rating per semester)

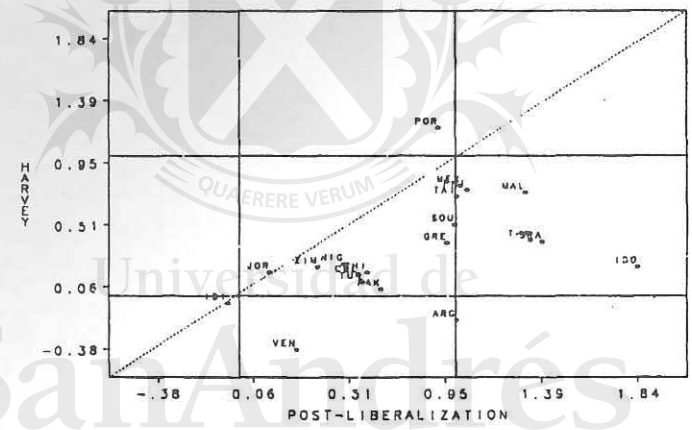
Fig. IV: ONE FACTOR MODEL

Alpha: Harvey (1995) vs. Post – liberalization



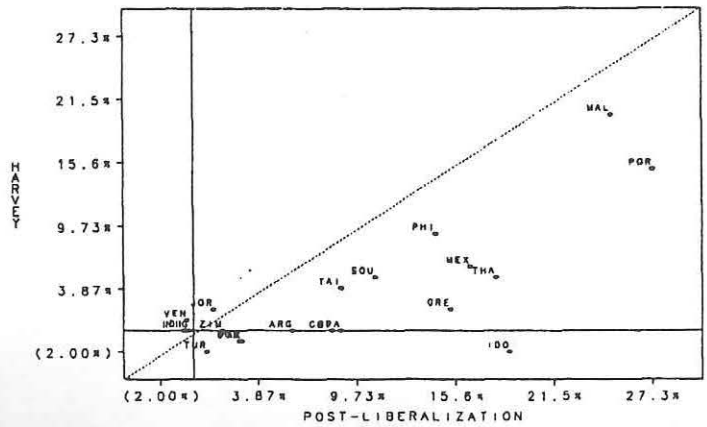
(diagonal f(x) ~ =x)

Beta: Harvey (1995) vs. Post – liberalization



(diagonal f(x) ~ =x)

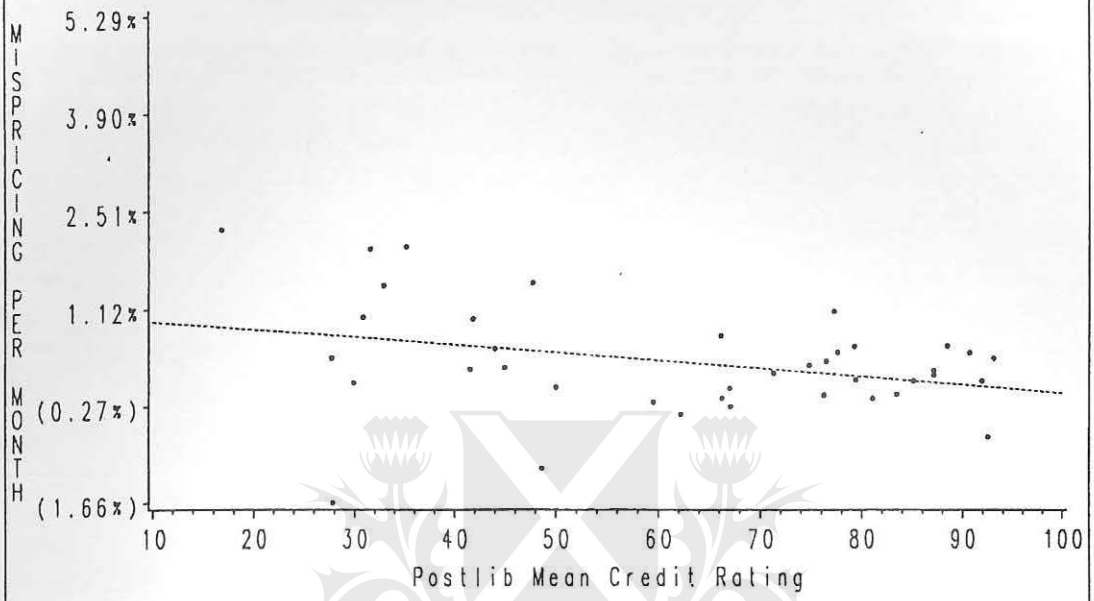
ADJ. R2: Harvey (1995) vs. Postlib



(diagonal f(x) ~ =x)

Fig. V: WHERE IS THE ONE FACTOR MODEL FAILING?
Mispricing and Mean Credit Rating in Post-Liberalization

Dotted line = best fitting line

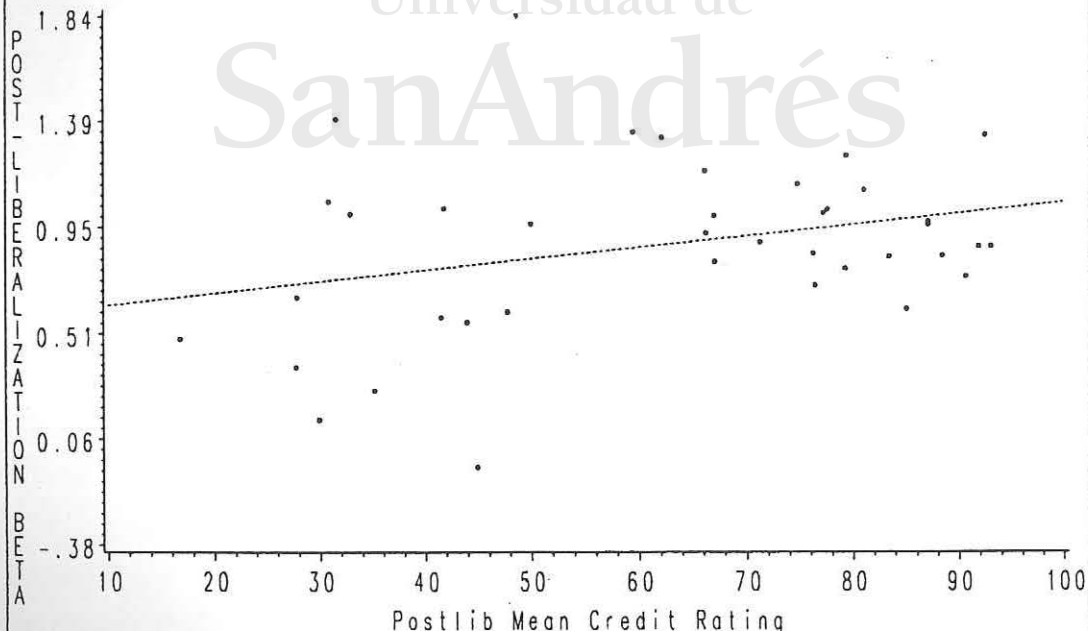


R2 = .1055, t ratio for slope = −2.09 – see text for details

Includes developed and emerging countries

Beta and Mean Credit Rating

Dotted line = best fitting line

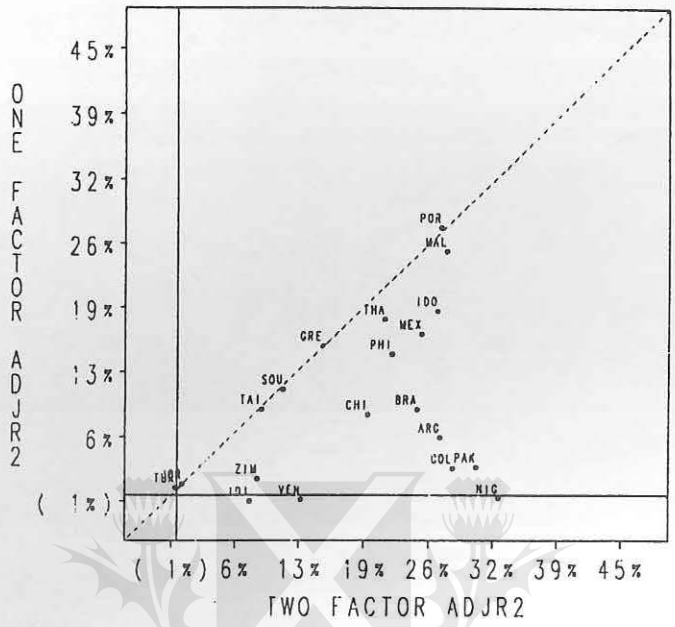


R2 = .09, t ratio for slope = 1.88 – see text for details

Both developed and emerging countries

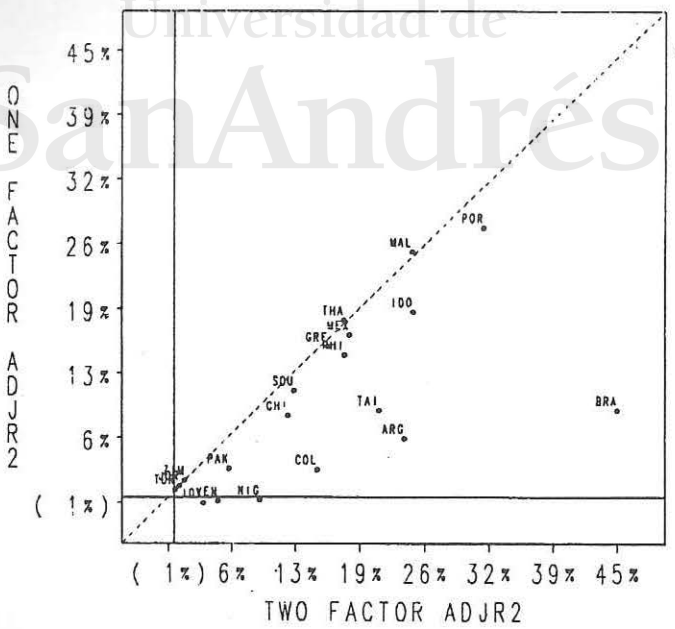
Fig. VI: ADJ. R2 FROM ONE FACTOR Vs. TWO FACTOR MODEL

HML – ONE WAY SORT



(diagonal f(x) ~ = x)

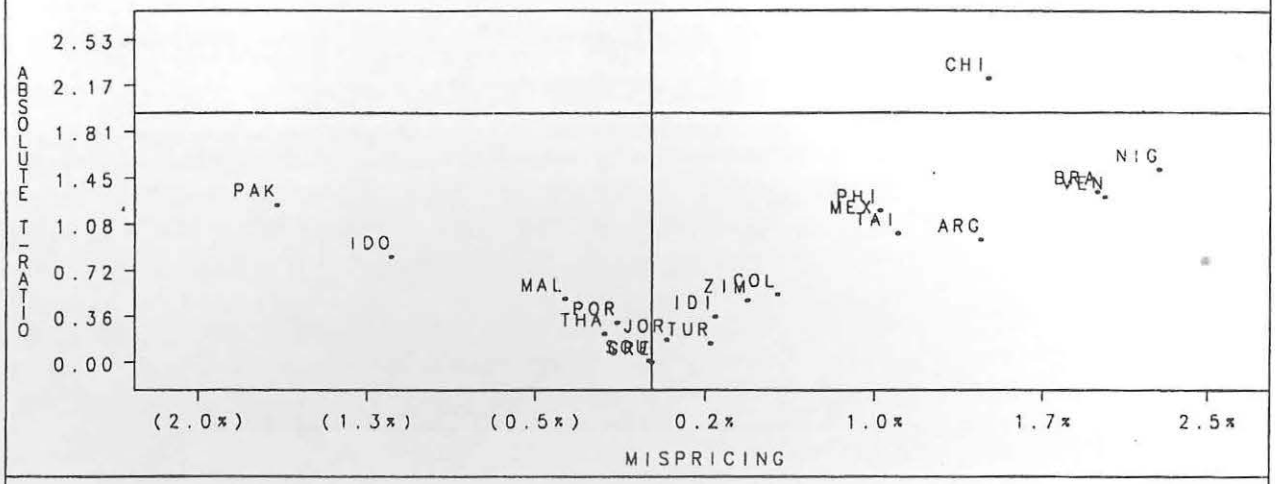
HML – TWO WAY SORT



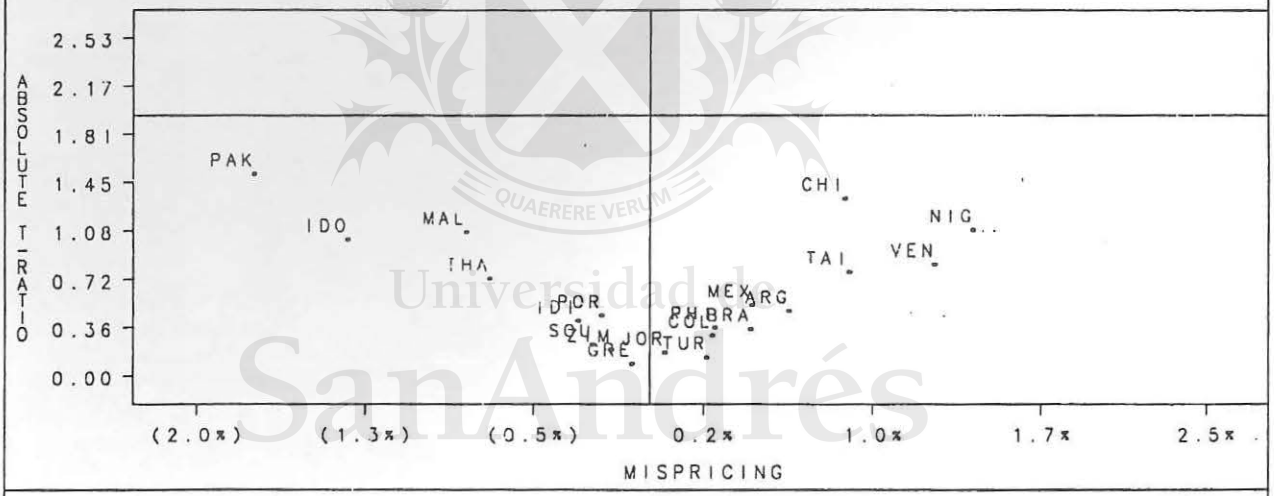
(diagonal f(x) ~ = x)

FIG. VII: MISPRICING AND ABSOLUTE T – STATISTIC

ONE FACTOR MODEL



TWO FACTOR MODEL – ONE WAY SORT



TWO FACTOR MODEL – TWO WAY SORT

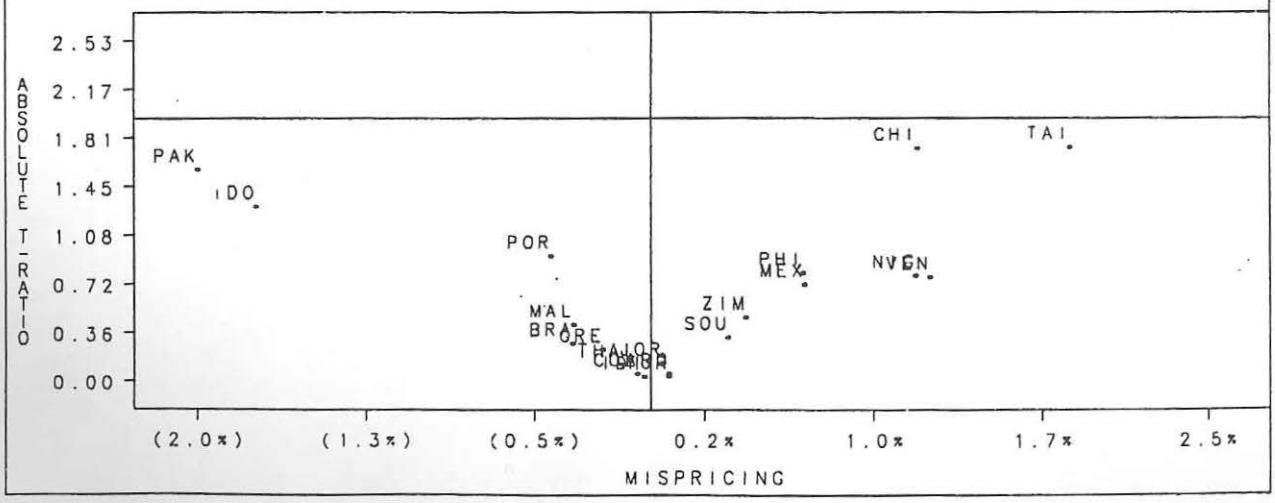
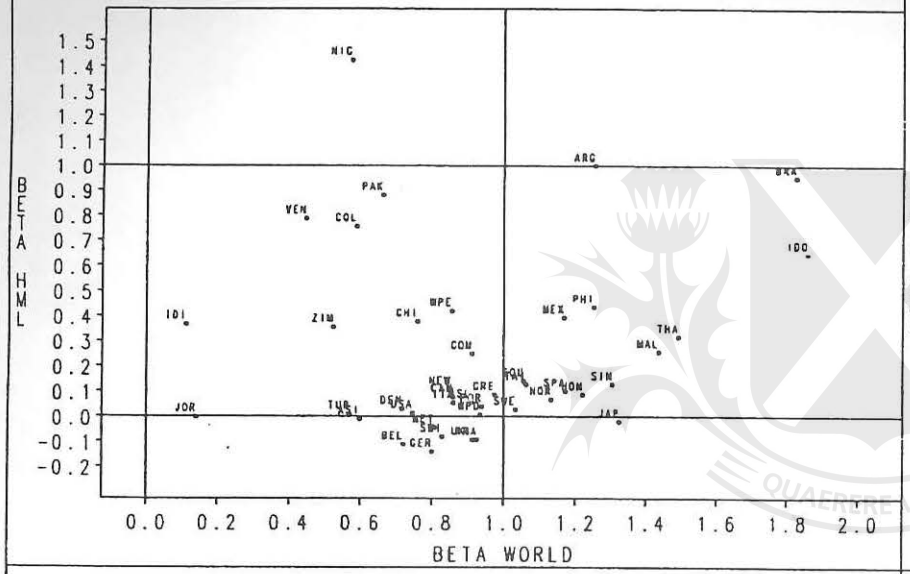
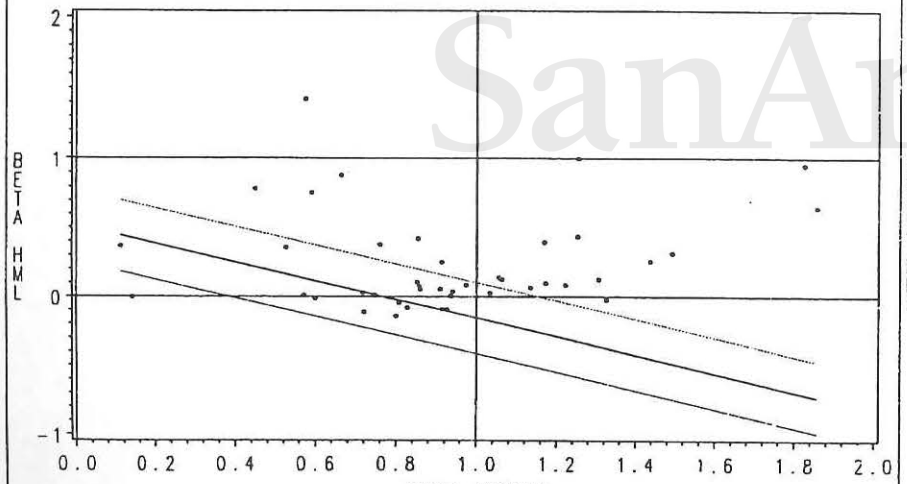


Fig. VIII: COUNTRY RISK EXPOSURE

HML – ONE WAY SORT



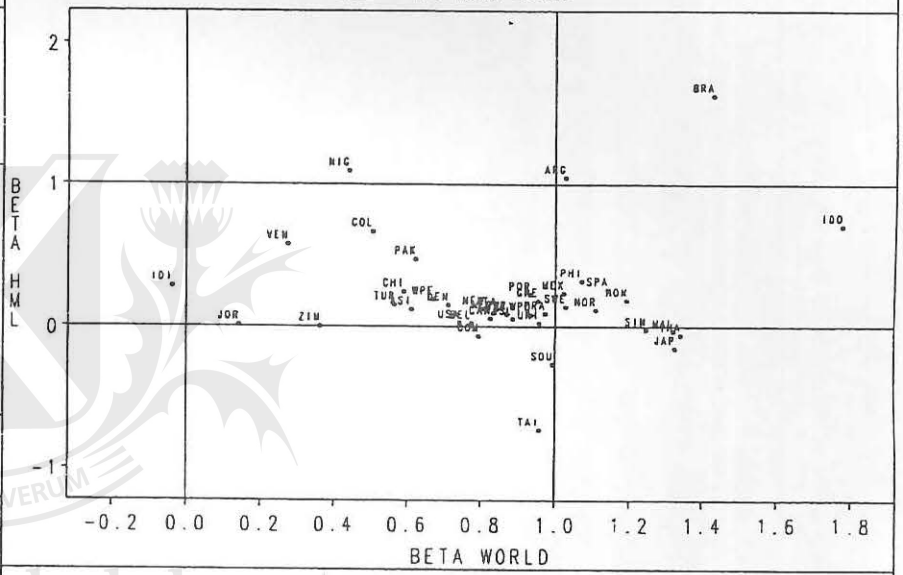
ISORETURN MAP



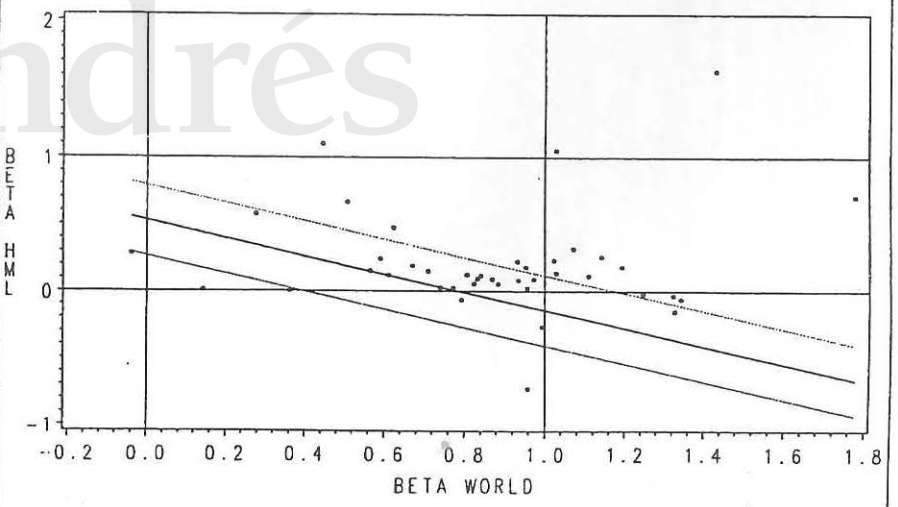
MIDDLE LINE = USA(=56BP/pm), TOP LINE = 1.5*USA, BOTTOM LINE = 0.5*USA

Fig. VIII: COUNTRY RISK EXPOSURE

HML – TWO WAY SORT



ISORETURN MAP



MIDDLE LINE = USA(=56BP/pm), TOP LINE = 1.5*USA, BOTTOM LINE = 0.5*USA