

Capital Flows and the Behavior of Emerging Market Equity Returns*

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Foreign portfolio flows may reflect deep changes in the functioning of an emerging market economy and its capital markets. Using a database of monthly net U.S. equity flows, we investigate the relation of these flows to the behavior of equity returns, the structural characteristics of the capital markets, exchange rates, and the strength of the economy. We find that increases in equity flows are associated with a lower cost of capital, higher correlation with world market returns, lower asset concentration, lower inflation, larger market size relative to GDP, more trade and slightly higher per capita economic growth.

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1. Introduction

During the last decade, we have witnessed significant changes in the pattern of world capital flows with some of the most dramatic changes taking place in emerging markets. In the late 1980's and early 1990's, a number of developing economies initiated reforms to liberalize their capital markets. These reforms made it easier for both foreign investors to access the local market and for domestic investors to diversify their portfolios internationally. Increasingly, foreign equity and bond purchases have become an important source of capital for developing countries.

The recent crises in Asia, and in Mexico in 1994, emphasize the importance of understanding both the impact of capital market liberalizations and the role of foreign portfolio flows for a country's economic prospects. The views widely differ. On the one hand, there is a new stream of research that examines the role of the financial sector and economic growth prospects. King and Levine (1993a,b), Levine and Zervos (1996), Rajan and Zingales (1997), and Bekaert and Harvey (1998) all find a positive relation between the development of the financial sector and economic growth. Obstfeld (1994) explicitly links financial market integration to economic growth. Moreover, Bartolini and Drazen (1996) describe free capital mobility as a possible signal for the government to use to enhance the credibility of a broader reform program. On the other hand, Krugman (1992) is skeptical about the benefits of capital market liberalizations and Mathieson and Rojz-Suarez (1992) describe how an open capital account may undermine structural reform programs. Worse, some have argued that "the integration of financial markets is dangerous and destabilizing."¹

Our goal is to characterize the relation between U.S. equity flows to emerging mar-

kets and important financial and macroeconomic variables. We use data on net U.S. equity capital flows to 17 emerging markets during the 1977–1996 period. Following Bekaert, Harvey and Lumsdaine (1999), we identify the break point in net equity capital flows (either up or down). We view these break-points as indicative of the date when the marginal investor may have changed from local to foreign or vice versa. With these dates, we examine the behavior of a wide variety of economic and financial indicators.

We examine four categories of indicators. The first group includes the cost of capital, correlation with the world market return, and volatility. The second group focuses on the structure of the market. We include indicators such as the asset concentration ratios, the size of the market and liquidity indicators. The third category is the economy: foreign exchange volatility, real exchange rates, real GDP per capita, the size of the trade sector, inflation, interest rates and fiscal deficits are analyzed. The last category is country risk. We are interested in the international perceptions of political, economic and financial (credit) risk before and after changes in capital flows.

It is important to be reminded that capital flows are endogenous. Generally speaking, capital flows should be considered the endogenous outcome of a portfolio choice problem. While we report statistics based on pre and post capital flow break points, at no point do we argue that increases in net capital flows ‘cause’ changes in any of these indicators. The complex process of liberalization provides the foundation for increases in capital flows. It is likely that the components of this process account for the changes in the variables that we report.²

Our exploratory analysis remains useful in the light of the many financial and economic woes ascribed to foreign investors by concerned policy makers. The nature of our

exercise prevents us from testing formal hypotheses but our results may guide future empirical and theoretical work. In addition, our results may cast doubt on some popular rhetoric regarding the implications of foreign capital inflows.

The paper is organized as follows. The second section provides the setting for our investigation describing the relation between capital flows and financial market integration. The third section provides a brief description of the capital flow data that we use and some summary statistics. In this section, we describe our calculation of the break points. The fourth section details the behavior of the returns, financial structure, economy, country risk and liquidity around capital flow breaks. Some concluding remarks are offered in the final section.

2. Capital Flows and Financial Market Integration

It is useful to distinguish between economic integration and financial integration. Economic integration is associated with the reduction in trade barriers (see Sachs and Warner (1992) for an extensive survey). Financial integration is associated with barriers to portfolio investments. It is often the case that these two concepts are linked. Indeed, Bekaert and Harvey (1995) use the size of the trade sector as an instrument for financial integration. While our focus is on financial integration, we will track the behavior of the trade sector to investigate whether financial integration coincides with economic integration in our sample.

A market is financially integrated if a project with identical risk has identical expected returns across different markets. The opposite of market integration, market

segmentation, can cause fundamental distortions in an economy. In the segmented market, local investors are restricted to investing in local securities and foreign investors are not allowed (or the cost is high) to invest in the local market.

Obstfeld (1994) and Stulz (1997) detail some of the distortions that occur in the segmented market. Local investors are unable to diversify their equity portfolios because they can only invest in local securities. Further, the local market is usually very small with only a small number of securities. Since investors will pay a premium for diversification, new local firms will arise that inefficiently operate in industries that provide diversification. Current firms may also diversify away from their core activities by accepting negative net present value projects that make them more attractive to investors. One can see that segmentation directly leads to an inefficient allocation of productive resources.

The process of integration should reverse these inefficiencies. Investors will no longer be interested in investing in inefficient domestic companies when they can purchase a foreign stock that is efficient. If the economic liberalization occurs at the same time, the inefficient companies will likely be driven out of business because of price and quality competition from foreign producers. Similarly, the current producers in the local economy may reallocate capital from the inefficient conglomerate divisions to the divisions that have a comparative advantage. Nevertheless, Bekaert and Harvey (1995, 1997a, 1999) argue that it is particularly difficult to pin down the exact date when the local market becomes integrated with world markets. Using the legislative dates of capital market liberalizations is fraught with danger. For example, a country might initiate wide-spread reforms – but foreign investors ignore the country's equities because of mar-

ket imperfections, because the reforms are incomplete, or because they deem the reform program not credible. Hence, while technically open, the market is effectively segmented.

The patterns in net capital flows should reveal much information about market integration. After legal reforms are initiated and the market structure is satisfactory, that is, if the market becomes truly integrated, we should see an increase in capital flows. It is also possible that the market moves in the other direction, i.e. towards segmentation. If restrictive measures are initiated or the political and economic environment is not conducive to international investors, capital flows should 'dry up'. It is therefore also important to carefully consider the particular economic and political environments within each country. We have formed chronologies of important events that might impact capital flows for 20 countries. The timelines for each country are presented in www.duke.edu/~charvey/Country_risk/chronology/chronology_index.htm.

Our investigation does not address the question: Should a developing country prefer direct investment flows to portfolio flows? We choose to concentrate on the portfolio flows, more particularly on equity flows. However, we can indirectly shed some light on this question. It is popularly believed that since portfolio investment is more mobile than direct investment, increased portfolio investment could destabilize an economy and its financial markets. This leads us directly to our investigation of capital flows and equity returns. Destabilization might manifest itself through increased equity volatility. Early work in Bekaert (1995), Tesar and Werner (1995a) and Bekaert and Harvey (1997a) suggest that this is not the case, but the results in Bekaert and Harvey (1999) are more mixed. We reassess these results and expand the scope of examination to other sensitive measures such as foreign exchange volatility and turnover.

The behavior of equity returns also includes any change in the cost of equity capital. Clark and Berko (1997) find that surprise purchases of Mexican equity lead to a significant and substantial price rise. They conclude that the price rise is permanent, reflecting greater risk sharing and improved liquidity and hence induces a reduction in the cost of equity capital. Similarly, Henry (1997) documents a substantial positive price response to capital market liberalizations. Following Bekaert and Harvey (1999), we argue that the dividend yield is directly related to the cost of capital. We find that the dividend yield is sharply lower after increases in capital flows. Even if the change constitutes an actual change in the cost of capital, it is important to realize that foreign investment may not be the only causal factor. For example, Henry (1997) ascribes 50% of the price response to macroeconomic reforms (which may affect the growth rate of dividends as well) but Bekaert and Harvey (1999) find that an important part of the total drop in the dividend yield is accounted for by capital market liberalizations. We also find that correlations with the world market return are doubled after capital flow breaks. A decrease in expected returns and an increase in correlations suggests that the process of market integration leads to reduced diversification benefits for international investors, confirming the results in Bekaert and Urias (1996).

The rest of our paper details the association of capital flow breaks with financial and economic fundamental variables. We find that there are changes in almost every measure we examine moving from a low capital flows period to a high capital flows period.

Our focus on equity flows is potentially quite restrictive. Equity capital may flow into an emerging market while bond flows are drying up. Of course, after a general market opening, we expect both bond and equity flows to increase more or less simultaneously

as foreign investors adjust their portfolios. We therefore obtained data on bond flows and examine how they correlate with equity flows.

3. Capital Flows Data

3.1 World capital flows

The ideal data for the study of capital flows is a monthly world matrix of flows. Each element would detail the net flow from (row) a country to (column) another country. However, the task of constructing such a matrix is extraordinarily difficult. First, the U.S. is one of the few countries which has detailed monthly measurements for 65 countries. Even the U.K, a country with bountiful economic data, does not report flows to individual countries. Second, even if two countries report flows, they are not easily reconciled because of different collection conventions. For example, Tesar and Werner (1994) do some basic cross checking of U.S. Treasury and Canadian data and find that the average quarterly net purchases of U.S. shares reported by Statistics Canada is less than half of those reported by the U.S. Treasury while no similar magnitude of discrepancy is found for the reported U.S. net purchases of Canadian equity. Third, the country of origin is not necessarily the final destination for the capital flows. For example, much of the flow to the U.K. is channeled to other European and world investments because London is the leading world clearing house for non-U.S. transactions.³

Some attempts have been made to reconcile and create a flow matrix. Indeed, there is great practitioner interest in this exercise. Empirical evidence from U.S. data on stock inclusions in a major index (Shleifer, 1986 and Harris and Gurel, 1986) or flows to

mutual funds, (Warther, 1995) suggests that flows impact prices. Presumably a superior measure of flow could lead to excess profits in the context of a trading strategy. Howell (1993) and Howell and Cozzini (1991, 1992) undertake the construction of a capital flow matrix.

We have obtained the Howell matrices for the years 1986 through 1992.⁴ Unfortunately, these matrices are only prepared on an annual basis. Furthermore, emerging markets are coarsely organized into three categories, Latin American, Asia and Other. Finally, many of the liberalizations were taking place in the early 1990s and these data end in 1992.

The Howell data, however, can give some insight on what we are missing, in focusing on purely U.S. Treasury data. For example, in 1992 the total net equity flows to emerging markets was US\$15.95 billion as reported in Howell. Of that amount, \$8.97 billion originated from the U.S. The next most important country is the U.K with \$2.85 billion in flows (some of which is probably U.S. originated). The Department of Treasury data suggests that the U.S. equity flows to emerging markets in 1992 was \$5.54 billion. This comparison suggests that the Treasury data captures a sizable portion of the flows to emerging markets.

3.2 U.S. capital flows

Tesar and Werner (1994) provide a detailed analysis of the components of the U.S. capital flows data. The U.S. international portfolio investment transactions are reported through

the Department of Treasury's (DOT) "International Capital Form S". Operationally, the 12 district Federal Reserve Banks, principally the Federal Reserve Bank of New York, collect these data, maintain contact with the respondents, and ensure the accuracy and integrity of the data (Kester, 1994). Tabulation of the data, however, is done by the Department of the Treasury and is presented in its *Quarterly Bulletin*. The reporting is done on a monthly basis.

By law, banks, brokers, dealers and other financial institutions, and individuals are required to report the value of any long-term security transactions involving a foreign resident. American Depositary Receipts (ADR) transactions are included in the figures. Securities transactions are reported on a transactions basis. Securities transactions are recorded by the nationality of the person you are carrying the transaction with, not by the country that originally issued the security. A foreigner is any individual, branch, partnership, association, corporation or other organization located outside the United States. Additionally, securities are recorded according to the residency of the issuer and not their currency denomination.

Exceptions for reporting are given when the total purchases and the total sales of securities are less than \$2 million for the reporting month. There are penalties for failing to report which can result in a civil penalty of up to \$10,000 and up to a year in prison for willful failure to report (see DOT International Capital Form S: Instructions in the appendix).

As mentioned earlier, there are several problems with the data. The increasing complexity of financial transactions and the development of new financial instruments makes it harder to record all the appropriate information. Kester (1994) details three poten-

tial problems related to the reporting procedures themselves. These problems involve recording of information of U.S. residents living abroad, financial transactions carried out in foreign financial centers, and stocks of securities held by U.S. residents that are classified geographically by the counterparty and not by the issuing country.

Our data comes directly from the *Treasury Bulletin's* Table CM-V-4-“Foreign Purchases and Sales of Long-Term Securities by Type and Country”. This table reports “Gross purchases by foreigners” which we classify as a U.S. sale and “Gross sales by foreigners” which we classify as a U.S. purchase. We focus on foreign equity securities (columns 7 and 14) and bond securities (columns 6 and 13).

3.3 Accumulating capital flows and break points

The capital flow data have been extensively studied before in a portfolio allocation context by Bohn and Tesar (1996) and Tesar and Werner (1994, 1995a,b). We begin by accumulating the capital flows to obtain an approximate measure of the ratio of U.S. ownership to market capitalization. This process must include local market equity appreciation realized by the U.S. investor. The dollar position of U.S. investors in emerging equity market i is:

$$\text{Ownership}_{i,t} = \text{Flow}_{i,t} + \text{Ownership}_{i,t-1}(1 + R_{i,t}) \quad (1)$$

where $\text{Flow}_{i,t}$ is the net capital flow in period t and $R_{i,t}$ is the market i return in U.S. dollar terms from the International Finance Corporation (IFC).⁵ We also calculate the cumulative net capital bond flows. Since we do not have information on bond returns in each market, we present a simple accumulation of the net bond flows. While our statistical analysis concentrates on equity ownership using (1), Figure 1 presents the

simple accumulation of equity and bond flows. The correlations that are reported in the figures are also based on the simple accumulations.

One problem that we face is the starting point. The capital flow data from the Department of the Treasury begins reporting in January 1977. However, for many countries there are zero entries for a number of years. In addition, we rely on the IFC data to calculate the increase in equity ownership resulting from a rise in the local market index. Hence, the starting point for (1) differs across many countries. Further, we do not know the initial stock of U.S. capital in the emerging stock market. Hence, it is possible that we calculate some of the early ownerships as small negative numbers. The negative ownerships do not concern us too much given the nature of our examination. Our focus is on the more recent flow data. In addition, we are concerned with the patterns in the flows - not the levels. Finally, it also may be the case that foreigners hold portfolios different than the IFC index. Kang and Stulz (1997) show that foreign investors are more likely to invest in securities that are large and well known. The IFC indices have some advantage here over more comprehensive local indices because of the IFC's focus on large, relatively liquid securities.

Our first task is to assess the break points in the equity flows. We use the break points that are reported in Bekaert and Harvey (1999). We examine 17 emerging markets that are tracked by the IFC. The IFC also tracks Jordan, Nigeria and Zimbabwe. However, the Treasury Bulletin does not include data on these countries.⁶

We use the endogenous break point tests detailed in Bai, Lumsdaine and Stock (1998). We report the 90% confidence interval for the break as well as the median point. In some countries, there is a wide confidence interval, e.g. Taiwan. In other countries,

the interval is extremely tight, e.g. Philippines. The technique tells us whether there is a break in the time-series - but it does not tell us if the break is up or down. A visual inspection of the data suggests that the 16 of the 17 are associated with increases in capital flows and only one, the Philippines, is associated with a decrease in capital flows.

Table 1 also reports the mean levels of ownership five years before and five years after (and including the break month). For some of the countries, we do not have data for five years after. We then report the average to the end of the sample. Table 1 confirms that foreign ownership is greater in the post period for every country except the Philippines. It may be the case that foreign equity ownership is increased at the expense of foreign bond ownership. However, this does not necessarily appear to be the case. Table 1 reports the mean levels of cumulative bond flows before and after the equity break. In 11 of the 16 countries, the bond flows increase (often sharply) after the equity break.

We report four types of test statistics over two different samples. In the first sample, the Philippines (the only country where the capital flows break in a downward direction) is excluded. In the second sample, all countries with insignificant breaks, from the first column of Table 1, are excluded. The first statistic is a simple difference in means across the 17 countries. This test allows for different variances in the pre and post data but imposes independence across countries and across time.

The second set of tests are country specific. We conduct heteroskedasticity-consistent tests of the hypothesis of no change in each time series for each country. These tests also correct for a first-order moving average process in the residuals for all series that are available on a monthly basis. For those series which have components

that are observed at an annual frequency, we correct for a 12th-order moving average process. The test statistics' p-values are denoted with asterisks.

The third set of tests involves a multivariate estimation with a single indicator variable that is activated after the break dates. The coefficient on this variable represents the average difference in the post-break period. We test whether this single coefficient is different from zero. This estimation is group-wise heteroskedasticity consistent (allows for different variances across the countries). We also allow the errors to follow panel-specific moving average processes. Finally, we allow for fixed effects in the estimation.

The final test is another version of the multivariate test. In this test, we add country-specific indicator variables which pick up the country-specific difference between the pre and post break mean. We conduct a group-wise heteroskedasticity and moving average-consistent Wald test that these coefficients equal zero.

Not surprisingly, equity flows increase significantly in all countries but the Philippines and U.S. ownership on average increases from less than 0.5% to 4 to 5% of local market capitalization. The changes are significant in every country. Except for Brazil, the change in cumulative bond flows is statistically significant. The χ^2 tests reveal a significant increase in cumulative bond flows which appears to be economically substantial.

Figure 1 allows a comparison of the patterns in equity and bond capital flows. In many countries, for example Argentina, there is a striking correlation between the equity and bond capital flows. In some countries (Brazil, Colombia, India, Indonesia, Malaysia, Thailand and Turkey), the equity capital flows 'lead' changes in the bond capital flows. In some other countries (Korea, Mexico, Pakistan and Venezuela), the bond market distinctively changes before the equity market.

The final columns of Table 1 report the correlations between the equity and bond flows. For the purpose of this table, we calculate the cumulative net equity flows, unadjusted for local market returns. This puts the equity flows on the same footing as the bond flows (which also do not include local market returns). The correlation is very high. There are six countries (Argentina, Brazil, Indonesia, Korea, Mexico and Pakistan) with correlations above 90%. The correlations are even higher if we focus on the post-1990 period. In this sample, the average correlation between the equity and bond flows is 51%. In general, the evidence points to the bond and equity markets being complementary sources of foreign funding rather than substitutes.⁷

4. Finance, economics and changes in capital flows

There are significant challenges in measuring equity volatility, correlation and the cost of capital for emerging markets. We choose to follow the path of Bekaert and Harvey (1997a) for volatility and correlation and Bekaert and Harvey (1999) for the cost of capital.

4.1 The cost of capital

Bekaert and Harvey (1999) argue that a change in the marginal investor and the different equity valuation it entails should have discrete effects on the price level of stocks [see also Korajczyk (1996)]. They argue that a technique exploiting information in price levels, as reflected in dividend yields, may be more powerful than trying to directly model expected returns. Indeed, the dividend yield has the advantage of being directly

measurable – that is, it need not be pre-estimated – and being a stationary random variable. Moreover, shocks to prices should dominate its variation over time. Finally, the dividend yield is intricately linked to the cost of capital.

Consider a simple example from Bekaert and Harvey (1999). Assume rational expectations and a discounted dividend model for the stock price, P_t :

$$P_t = E_t \left[\sum_{i=1}^{\infty} \delta_{t+i}^i D_{t+i} \right], \quad (2)$$

where D_t are the dividends and δ_t is the discount factor. Let:

$$L_t = \begin{cases} 0, & \text{before liberalization;} \\ 1, & \text{after liberalization.} \end{cases}$$

Further assume that the liberalization is a one-time, unexpected event. When the market is segmented, the required rate of return is constant and equal to r . When the market opens up, the required rate of return drops to \bar{r} . We can represent this simple model for expected returns as:

$$\delta_t = \frac{1}{1 + r - \eta L_t} \quad (3)$$

where $\eta = r - \bar{r}$, the drop in the cost of capital. Under this set of assumptions, the relation between the change in the dividend yield, $\bar{D}_t/\bar{P}_t - D_t/P_t$ and the change in the cost of capital η , depends on the dividend process.

In the standard Gordon model, which assumes that $E_t D_{t+i} = (1+g)E_t D_{t-1+i}$, this relation is virtually one to one.⁸ It is straightforward to show:

$$\begin{aligned} \eta &= r - \bar{r} \\ &= (1+g)\frac{D_t}{P_t} - (1+\bar{g})\frac{\bar{D}_t}{\bar{P}_t} + g - \bar{g} \end{aligned} \quad (4)$$

If the growth rate of dividends is not affected by the capital market liberalization, a regression of D_t/P_t onto the liberalization indicator variable, L_t , yields $-\eta/(1+g)$.

Hence, the slope coefficient provides a slight underestimate of the true response of the cost of capital.

Bekaert and Harvey (1999) detail the potential problems in using this measure in cost of capital estimation. Nevertheless, it is a reasonable starting point. Table 2 shows that the dividend yield decreases in 10 of 16 countries after the capital flow break point (with capital flow increases). On average, the dividend yield decreases from 3.86% to 2.65% implying a statistically significant (at the 10% level) reduction in the cost of capital. This analysis includes all countries except the Philippines where a significant down break in capital flows occurred. If we specialize the analysis to the set of countries that experienced an significant increase in equity capital flows, the dividend yield moves from 4.27% to 2.47%. This decrease is also statistically significant across all of our tests.

Although much noisier, it is also possible to gain some insights from the log ex post returns. We find that the average U.S. dollar returns in the five year period before the capital equity flow break is 20.00% and 13.36% following the break. While this is a large absolute difference in average returns, the multivariate test is only significant at the 10% level. This is consistent with the simulations in Bekaert and Harvey (1998) which show that it is much more difficult to observe a shift in the cost of capital by examining the behavior of equity returns.

4.2 Volatility and correlation

We follow the work of Bekaert and Harvey (1997a) and estimate a sophisticated time-series model for volatility for each country that allows both the conditional mean and the conditional variance to vary through time.⁹ We condition on both world and

local information to capture the changes in the degree of market integration. This model delivers a time-series of conditional volatilities for each country as well as conditional correlations of each country's return with the world market return.

The following section follows the steps detailed in Bekaert and Harvey (1997a). Define the arithmetic excess return on the national equity index of country i in U.S. dollars as $r_{i,t}$. Our model has three components. First, the conditional mean, $\mu_{i,t-1}$, is assumed to be time-varying:

$$r_{i,t} = \mu_{i,t-1} + \epsilon_{i,t}. \quad (5)$$

Second, the unexpected return, $\epsilon_{i,t}$, is determined by both a common world shock, $\epsilon_{w,t}$ and a purely idiosyncratic (country-specific) shock, $e_{i,t}$,

$$\epsilon_{i,t} = v_{i,t-1}\epsilon_{w,t} + e_{i,t}, \quad (6)$$

where $v_{i,t-1}$ is a time-varying weight that reveals the relative importance of world versus local information. Finally, the local idiosyncratic conditional variance, $(\sigma_{i,t}^\ell)^2$, follows an asymmetric GARCH (1,1) which follows from the work of Glosten, Jagannathan and Runkle (1993):

$$(\sigma_{i,t}^\ell)^2 = E[e_{i,t}^2 | \mathbf{I}_{t-1}] = c_i + \alpha_i(\sigma_{i,t-1}^\ell)^2 + \beta_i e_{i,t-1}^2 + \gamma_i S_{i,t} e_{i,t-1}^2, \quad (7)$$

where \mathbf{I}_{t-1} is the information available at time $t-1$ and $S_{i,t}$ is an indicator variable which takes on the value of one when the idiosyncratic shock is negative and zero otherwise.

We also assume that

$$e_{i,t} = \sigma_{i,t}^\ell z_{i,t}, \quad (8)$$

where $z_{i,t}$ is a standardized residual with zero mean and unit variance. We investigate two distributional assumptions for the standardized residual, $z_{i,t}$: the normal distribution

and a mixture of normal distributions. The latter distribution allows for both skewness and kurtosis.

The conditional mean of country i 's return is assumed to be linear in a set of global and local information variables. The global information variables include: a constant, the world market dividend yield in excess of the 30-day Eurodollar rate, the default spread (Moody's Baa minus Aaa bond yields), the change in the term structure spread (U.S. 10-year bond yield minus 3-month U.S. bill), and the change in the 30-day Eurodollar rate. These variables are designed to capture fluctuations in expectations of the world business cycle [see Harvey (1991)]. The local information variables include: a constant, the equity return, the exchange rate change, the dividend yield, equity market capitalization to GDP and trade to GDP. All of the information variables are known at time $t - 1$. The financial variables are lagged by one month and the macroeconomic variables are lagged by one year to allow for reporting delays.

The world market expected returns and variances are a special case of (1)–(5), with $i = w$, $\sigma_{i,t}^\ell = \sigma_{w,t}$, $v_{w,t-1} = 0$. The conditional mean of the world market return, $\mu_{w,t-1}$, is assumed to be a linear function of global information variables. Finally, the relative importance of world versus local information in the variance equation is defined as:

$$v_{i,t-1} = \mathbf{q}_{i,0} + \mathbf{q}_{i,1}' \mathbf{X}_{i,t-1}^* \quad (9)$$

where, following Bekaert and Harvey (1997a), $\mathbf{X}_{i,t-1}^*$ includes the subset of the local information variables which might proxy for the degree of market integration: market capitalization to GDP and the size of the trade sector (exports plus imports divided by GDP). The data for this exercise are U.S. dollar total return indices for 20 countries provided by the IFC and the sample covers the 1976-1995 period. These data are described

in more detail in Bekaert and Harvey (1995).

The results are contained in Table 2. In 11 of 17 countries, the fitted correlation with the world increases. On average the correlation increases from 0.09 to 0.18 which is significant in the multivariate tests that allow for country-specific coefficients. We also calculated ex post betas with the MSCI world market portfolio. The betas increase from an average of 0.33 to 0.48 which is significant at the 11% level. When we examine only the countries with significant increases in equity flows, the betas increase from an average of 0.11 to 0.48. This change is significant at the 5% level and suggestive of higher correlations with world aggregates.¹⁰

The results for volatility are more ambiguous. The fitted volatility declines in 9 of 17 countries. On average, volatility falls from 49% (on an annual basis) to 43% after the break in net capital flows but the difference is not significant. On the other hand, when we look at the ex post volatility of the returns, there is more of a change. In the early period, the volatility is 44% which falls to 37% in the later period. This decrease in volatility is not significant. These results suggest that volatility neither systematically increases or decreases after capital flow breaks.

4.3 Financial market indicators

Table 3 details the behavior of a number of financial market indicators. We find that on average the number of stocks included in the IFC index significantly increases from 35 to 57 after the break in capital flows. The IFC index attempts to cover 70% of market capitalization (see Bekaert and Harvey, 1995). It seems like more stocks are being included in the country indices to attain the 70% minimum.

This suggests a pattern in stock market growth in the emerging markets. It is not as simple as the largest firms getting larger. Additional firms are entering the equity market and smaller current firms are becoming larger. This is consistent with the data on concentration ratios. The concentration ratio (modified Herfindahl ratio) declines, albeit insignificantly, after the break in capital flows. This is consistent with some smaller firms increasing in size at a rate faster than the larger firms. The cross-sectional average may also be influenced by a number of countries (e.g. Mexico) where privatizations introduced a number of large firms to the market.

Market capitalization to GDP increases after the flows break point. Market capitalization to GDP increases in 14 of 16 countries. On average the equity market accounts for 15% of GDP before the break and 29% of GDP after the break. The multivariate tests suggest that this increase is significant leaving little doubt that the size of the equity market relative to GDP increases.

We also examine the cross-sectional volatility of the individual security returns. This is a monthly measure of dispersion. If all of the securities were in one particular industry, the returns would be highly correlated and the cross-sectional volatility would be low. With industrial diversification, the cross-sectional volatility would be high. The results in Table 3 show no particular pattern.

We examine two liquidity indicators: average value traded divided by GDP and turnover. Average value traded is the average monthly value of the shares traded in millions of U.S. dollars. We divide this by the previous year's GDP. This ratio sharply increases in a number of countries. The overall ratio's change is significant at the 10% level for those countries that had a significant break in capital flows. The turnover

ratio is the total value of shares traded during the month divided by the average market capitalization. Some countries show significant increases in turnover and some show significant decreases. Overall, there are no particular patterns when examining the turnover ratio. Of course, some caution needs to be exercised in comparing the ratios across countries. Taiwan, for example, is an extremely influential observation. For interpretation, the emphasis should be placed on our multivariate tests which tend to down weight these influential observations in a generalized least squares framework.

Finally, we look at the foreign exchange market. We calculate a trailing annualized three-year standard deviation of exchange rate changes. The multivariate test that allows for country-specific coefficients suggest significant changes in FX volatility. The volatility of the FX rate is almost cut in half after the break in capital flows. The most dramatic decreases in FX volatility are found in Argentina and Mexico. Of course, dramatic changes in FX volatility could be induced by moving from a float to a pegged regime or by stabilization plans in countries with rampant inflation. Appendix A provides a chronology of the currency regimes in the emerging markets.

4.4 The economy

Table 4 details the association of capital flow breaks and fundamental economic variables. There are a number of interesting features. First, in the analysis that excludes only the Philippines, real per capita GDP growth increases from 2.73% to 2.93% after flow break points. Examining the countries with significant breaks, GDP per capita does not significantly change. On a country-by-country basis, Chile, Colombia, Mexico and Thailand have significant increases in real GDP per capita. There are increases in

Argentina, Greece, India, Malaysia, Portugal and Taiwan but they are not significant.

There is a sharp reduction in inflation in many countries. The overall average is skewed by Argentina and Brazil. Excluding these two countries, inflation drops from 21.61% to 18.78% after the flow break point. Similar results are found for local interest rates.

Capital flow breaks are also associated with changes in trading patterns. Table 4 indicates that the size of the trade sector is larger after portfolio flows break. On average the trade sector accounts for 61.4% of GDP after a flow break point compared to 50.4% before. These results are consistent with a joint process of financial market and economic integration. Indeed, as Feldstein and Horioka (1980) point out, in a world with free capital flows, savings and investment should be de-linked and large current account imbalances can be run since they can be feasibly financed. However, the data do not seem to support the notion that larger capital mobility has led to emerging markets running large current account deficits. On average, there is a trade surplus as a percentage of GDP of about 1.4% before the capital flows break point which increases to 2.8% on average after the break.

External debt to GDP also significantly decreases on average. While the long-term external debt decreases, the change is not significantly different from zero. With government deficits going down on average as well, it is tempting to conclude that the developing countries have reduced their external debt burden by improving their trade balances and freeing up resources from lower government deficits. In addition, despite the inflowing equity capital, they are actually exporting rather than importing capital, on average. This may suggest that developing countries are not relying on more foreign

capital at all but have simply replaced debt with equity. Consider the case of Chile in Figure 1. There is a clear negative correlation between equities and bonds and the largest decrease in external debt of all the countries in our sample. This is consistent with a substitution effect.^{11,12} Nevertheless, given the large cross-country differences, we should caution against such generalized inference. For example, more than half of the average increase in trade surplus to GDP in the post break period can be attributed to two European countries: Portugal and Greece.

We also compiled real exchange rate indices for the various countries by dividing the exchange rate in local currency to the dollar by the ratio of the local consumer price index to the U.S. consumer price index. These data are from the International Financial Statistics of the International Monetary Fund. Hence, an increase in the index suggest a real exchange rate depreciation. We find a significant real appreciation of the local currencies in nine of the 16 countries after equity flow breaks, and a significant drop in only four countries. Overall, foreign capital flows seem to lead to real exchange rate appreciations, as is often claimed. The change is highly statistically significant when we allow for country specific coefficients in the multivariate regressions.

4.5 Country Risk

We examine five different measures of country risk: Institutional Investor's Country Credit Rating (IICCR), International Country Risk Guide (ICRG) Economic risk, Political risk, Financial risk and Composite risk. The ICRG Composite risk is a weighted average to the first three components (see Erb, Harvey and Viskanta, 1996a,b). A higher country rating means lower risk. These measures are all ex ante. That is, in the case

of the IICCR, participants are asked to make an assessment of the future riskiness of a country.

The results in Table 5 suggest an unambiguous increase in rating across the different measures. For example, the ICRG Composite rating increases in every country except Venezuela. The average rating increases from 61.1 to 69.7 which is a statistically significant change. Erb, Harvey and Viskanta (1996a) link expected returns and country ratings. A 8.6 point increase in rating would translate into a 2.4% decrease in the expected returns. Overall, the message is that capital flow inflows are associated with investor perceptions of lower country risk.

4.6 Portfolio Results

We undertake one final experiment. We create two equally weighted portfolios. At each month, the first portfolio, which we call the “segmented portfolio” includes the returns of the countries that have not experienced a significant break in the equity capital flows. At each month, the second portfolio, which we call the “integrated portfolio” includes the returns of the country that have already experienced a significant break in the equity capital flows. The number of countries in each portfolio shifts through time as a number of countries move from the segmented portfolio to the integrated portfolio. As such, it is possible that the results could be heavily influenced by one or two countries when there are a small number of countries in the portfolio. To address this problem, we restrict the sample period to be January 1987 to September 1994.

The portfolio results are contained in Table 6. Consistent with our analysis of the cost of capital and our tests on the ex post returns, there is little difference in the ex

post observed returns (25.9% compared to 24.1% on an annual basis for the significant countries). We also find evidence of higher volatility. In the segmented portfolio, the average annualized volatility is 20.7% whereas in the integrated portfolio, the volatility is 35.2%. The volatility analysis contrasts with the inconclusive results in the ex post volatility analyzed in Table 2.

We also calculated the correlations and betas of the two portfolios with world returns. The correlation with the world portfolio increases from 0.13 to 0.36 moving from the segmented to integrated portfolio. We also find that the beta increases from 0.17 to 0.77. The increase in correlation is consistent with integrated markets being relatively more impacted by world information than segmented markets.

5. Conclusions

The idea of our paper is that patterns in capital flows can reveal information about market liberalizations. In a segmented capital market, there is unlikely to be significant foreign capital flows. An effective capital market liberalization may be associated with significant new foreign capital flows. Our starting point is to identify breaks in equity capital flows. In 16 of the 17 countries we examine, the break is associated with an increase in net capital flows. We then compare measures of both the financial system and the economy in the pre-break and post-break regimes.

We are the first paper to compare and contrast the behavior of both equity and bond capital flows. For many countries, the patterns of the equity and bond flows are very similar. In a few countries, it seems like the bond flows precede equity flows.

We find that expected returns decrease after significant breaks in capital flows. In addition, risk, at least as measured by country rating, decreases and the correlation of equity returns with the world market is higher. This seems consistent with a “one-time” portfolio adjustment associated with the movement from segmented to integrated markets. It does not seem to be consistent with the “return chasing” hypothesis postulated by Bohn and Tesar (1996).

In addition, we find that the increase in capital flows is associated with marginally higher per capita GDP, a larger trade sector, less long-term country debt, lower inflation, and lower FX volatility.

Although not all of these changes are statistically significant, the general picture is one that contradicts the view that foreign portfolio investors are detrimental to a developing country’s economy. Of course, our methods do not allow us to distinguish between the scenario where foreign equity investment is responsible for the improved macroeconomic and financial outlook and the scenario where it is simply attracted by the prospect of these improvements. Nevertheless, our suggestive findings of lower expected returns and risk and higher loadings on world factors are consistent with international investors re-balancing their portfolios in response to a wider opportunity set (see also Bohn and Tesar, 1996). If this is the case, policy makers across the world would be well advised to create an environment that attracts, rather than repels, foreign portfolio investors.

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Endnotes

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¹ See *Economist* (1997). Claessens, Dooley and Warner (1995) examine whether one can distinguish “hot”, speculative capital flows from long-run, stable flows.

² See Bohn and Tesar (1996), Calvo and Mendoza (1998) and Bacchetta and Van Wincoop (1998) for alternative models of capital flows.

³ Similar problems exist for measuring bond flows. Ito (1998) reports that bank lending both in Asia and Latin America is dominated by European Banks, not U.S. banks.

⁴ We grateful to Michael Howell for providing us with this information.

⁵ Tesar and Werner (1995a) do not take into account the capital gains on the equity investments for emerging markets. They report a simple accumulation of the net capital flows. However, Tesar and Werner (1994) do adjust for capital gains.

⁶ The IFC currently follows more than 20 markets. We use the full sample of countries that are available in 1992. Our statistical tests require a minimum number of observations. As a result, we do not include Eastern European countries and others that were added after 1992.

⁷ Negative correlations are found for Chile, Portugal and Taiwan which would suggest that the equity and bond markets might be substitutes in these countries.

- ⁸ The Gordon model is not a realistic model for stock price determination but Bekaert and Harvey (1998) show that its main intuition remains valid with more general models.
- ⁹ Other related work on volatility is De Santis and Imrohoroglu (1996), Aggarwal, In clan and Leal (1996), Kim and Singal (1997) and Richards (1996).
- ¹⁰ The pooled regression tests are not available for the betas or the ex post volatility because only two observations are available for each country, pre-break beta (volatility) and post-break beta (volatility).
- ¹¹ It is well known that many emerging markets have reduced their reliance on commercial bank debt and some, like Chile, have also reduced their reliance on foreign fixed income.
- ¹² There is some interesting theoretical and empirical work on the various sources of financing. For example, Boyd and Smith's (1996) model suggests that as an economy develops, the aggregate ratio of debt to equity will generally fall, yet, debt and equity remain complementary sources for the financing of capital investments. See the empirical work in Demurgüç-Kunt and Maksimovic (1996)

TABLE 1 Analysis of Net U.S. Capital Flows									
Net Equity Holdings Break Point				Level of Equity Holdings		Cumulative Net Bond Flows		Correlation of Equity and Bond Flows	
Country	5th Percentile	Mediana	95th Percentile	5 yrs before	5 yrs after ^{Sig.}	5 yrs before	5 yrs after ^{Sig.}	Full sample	Post-1990
Argentina	Apr-93	May-93 ***	Jun-93	-0.0201	0.1519 ***	-285.9	3642.7 ***	0.986	0.985
Brazil	Nov-87	Jul-88 ***	Mar-89	0.0013	0.0399 ***	-16.6	71.6	0.924	0.914
Chile	Jan-86	Feb-88	Mar-90	0.0003	0.0230 ***	-269.7	-906.3 ***	-0.789	-0.741
Colombia	Aug-93	Sep-93 ***	Oct-93	-0.0103	0.0206 ***	-174.9	187.3 ***	0.826	0.939
Greece	May-85	Jan-87 ***	Sep-88	-0.0177	-0.0065 ***	-44.3	-84.2 ***	0.155	0.645
India	Mar-93	May-93 ***	Jul-93	0.0006	0.0059 ***	-251.0	-183.2 ***	0.163	0.846
Indonesia	Feb-93	Jul-93	Dec-93	0.0124	0.0603 ***	42.6	861.6 ***	0.977	0.967
Korea	Sep-91	Apr-93 *	Nov-94	0.0080	0.0321 ***	-469.0	3159.5 ***	0.921	0.908
Malaysia	Feb-91	May-92	Aug-93	0.0082	0.0162 ***	-300.8	284.2 ***	0.514	0.581
Mexico	Jul-89	Jun-90 **	May-91	0.0753	0.1526 ***	213.7	10765.4 ***	0.978	0.962
Pakistan	Apr-93	May-93 ***	Jun-93	0.0001	0.0090 ***	1.6	67.8 ***	0.950	0.929
Philippines	Feb-90	Feb-90 ***	Feb-90	0.3240	0.1513 ***	-195.8	-717.8 ***	-0.475	0.226
Portugal	Jun-93	Sep-94	Dec-95	0.0231	0.0497 ***	-161.3	-197.8 ***	-0.826	-0.468
Taiwan	Sep-88	Sep-92		0.0001	0.0008 ***	-1287.4	-7209.2 ***	-0.394	-0.432
Thailand	Feb-88	Aug-88 ***	Feb-89	0.0076	0.0322 ***	-6.1	-145.5 ***	0.080	0.634
Turkey	May-88	Jan-90	Sep-91	-0.0300	0.0067 ***	-10.4	125.4 ***	0.803	0.616
Venezuela	Dec-93	Mar-94 ***	Jun-94	-0.0072	0.0082 ***	1044.1	1668.8 ***	0.505	0.230
Mean ^a				0.0032	0.0377	-123.5	756.7	0.423	0.532
P-value					0.01		0.17		0.31
Mean ^b				0.0038	0.0446	1.2	1915.0	0.649	0.799
P-value					0.03		0.06		0.15
P-value ^a , FE					0.00			0.56	NA
P-value ^b , FE					0.00			0.87	NA
P-value ^a , JS					0.00			0.00	NA
P-value ^b , JS					0.00			0.00	NA

^aExcludes Philippines which has a break down in capital flows

^bExcludes Philippines and countries with breaks that are not significant.

Bond flows are reported in millions of U.S. dollars.

Test Statistics are detailed below:

Sig. indicates the Newey-West corrected T-stats on the univariate regression:

$$\text{Series} = B0 + (\text{Indicator for Five Years After Break}) * B1$$

FE indicates the T-stat significance on a panel estimation with fixed effects of the regression:

$$\text{Series}[i,t] = B0[i] + (\text{Indicator for Five Years After Break})[i,t] * B1$$

JS indicates the Chi-Square joint test that all of the coefficients are zero in the pooled time series regression with fixed effects:

$$\text{Series}[i,t] = B0[i] + (\text{Country Specific Indicator for Five Years After Break})[i,t] * B1[i]$$

All multivariate regression tests are corrected for group-wise heteroskedasticity and group-wise moving average processes in the residuals.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

TABLE 2 Behavior of Equity Returns																
Country	Dividend yield			Fitted Correlation with World			Fitted Volatility (annual)			Ex Post Log Returns (annual)			Ex Post Volatility (annual)		Betas	
	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	5 yrs before	5 yrs after
Argentina	1.99	2.94	***	0.12	0.26	***	119.67	60.34	***	46.74	18.02		99.31	33.67	-0.93	1.31
Brazil	5.00	3.81		0.06	0.06		61.69	79.24	***	23.48	13.35		61.94	79.21	0.26	1.22
Chile	5.22	6.38	**	0.12	0.09	***	33.55	31.86	**	19.00	39.23		34.60	24.72	0.58	-0.09
Colombia	5.04	1.89	***	0.04	-0.02	***	27.37	25.45		35.06	14.77		33.22	27.44	0.16	0.03
Greece	9.91	4.24	***	0.12	0.16	***	26.46	46.86	***	-10.80	30.46		25.36	50.56	-0.11	0.62
India	1.67	1.09	***	-0.02	-0.18	***	33.57	27.77		14.37	5.60		38.22	28.36	-0.47	0.25
Indonesia	0.84	1.40	**	0.06	0.32	***	73.17	56.43		-7.80	19.20		32.07	28.19	0.20	0.78
Korea	1.33	1.33		0.22	0.21		27.78	25.95	**	2.42	5.83		29.74	22.64	0.68	0.51
Malaysia	2.14	1.68	***	0.48	0.49		21.42	22.87		10.74	17.82		28.22	24.87	1.10	0.72
Mexico	3.62	1.82	***	0.15	0.32	***	46.38	35.79	*	43.69	12.17		63.32	40.19	1.15	0.78
Pakistan	5.23	1.80	***	0.02	0.12	***	32.29	30.87		17.70	5.59		26.34	26.34	0.03	-0.11
Philippines	2.75	1.05	***	0.29	0.39	***	35.69	34.90		63.32	11.04	**	35.56	34.64	0.57	0.87
Portugal	3.09	3.20		0.51	0.50		26.67	19.30		3.35	13.23		24.52	14.26	0.90	0.48
Taiwan	0.56	1.08	***	-0.04	0.21	***	73.12	69.68		12.16	11.95		62.32	36.18	0.91	0.94
Thailand	7.52	3.21	***	-0.10	0.38	***	28.07	27.76		27.14	19.16		28.45	28.11	0.71	0.55
Turkey	7.13	4.00	***	-0.39	0.02	***	96.80	68.40	*	59.38	-5.31		74.41	64.37	0.47	0.09
Venezuela	1.41	2.55	***	0.08	0.00	***	52.77	58.07		23.36	-7.30		48.37	61.11	-0.39	-0.35
Mean ^a	3.86	2.65		0.09	0.18		48.80	42.91		20.00	13.36		44.40	36.89	0.33	0.48
P-value		0.07			0.10			0.21			0.13			0.15		0.11
Mean ^b	4.27	2.47		0.07	0.13		44.81	40.00		22.32	11.76		45.43	39.76	0.11	0.48
P-value		0.00			0.25			0.12			0.02			0.24		0.04
P-value ^a , FE	0.08			0.19			0.09			0.73			NA		NA	
P-value ^b , FE	0.11			0.37			0.08			0.61			NA		NA	
P-value ^a , JS	0.00			0.00			0.27			0.97			NA		NA	
P-value ^b , JS	0.07			0.00			0.25			0.94			NA		NA	

^aExcludes Philippines which has a break down in capital flows

^bExcludes Philippines and countries with breaks that are not significant.

Test Statistics are detailed below:

Sig. indicates the Newey-West corrected T-stats on the univariate regression:

Series = $B_0 + (\text{Indicator for Five Years After Break}) * B_1$

FE indicates the T-stat significance on a panel estimation with fixed effects of the regression:

Series[i,t] = $B_0[i] + (\text{Indicator for Five Years After Break})[i,t] * B_1$

JS indicates the Chi-Square joint test that all of the coefficients are zero in the pooled time series regression with fixed effects:

Series[i,t] = $B_0[i] + (\text{Country Specific Indicator for Five Years After Break})[i,t] * B_1[i]$

All multivariate regression tests are corrected for group-wise heteroskedasticity and group-wise moving average processes in the residuals.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table3 Financial Indicators																					
Country	Number of Companies			Concentration Ratio			Market Cap to GDP			Cross-Sectional Standard Deviation			FX Volatility			Value Traded to GDP			Turnover		
	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.	5 yrs before	5 yrs after	Sig.
Argentina	25.78	32.10	***	0.28	0.29		0.04	0.08	***	0.25	0.12	***	0.38	0.03	***	2.09	2.55		0.47	0.30	***
Brazil	21.42	56.93	***	0.29	0.18	***	0.04	0.05	***	0.21	0.26	**	0.06	0.14	***	1.47	2.04	**	0.42	0.38	
Chile	23.90	29.62	***	0.22	0.22		0.09	0.46	***	0.14	0.10	***	0.05	0.02	***	0.86	2.67	***	0.08	0.09	
Colombia	20.25	24.42	***	0.19	0.20	**	0.07	0.19	***	0.13	0.12		0.02	0.02	***	0.36	1.40	***	0.06	0.10	***
Greece	10.00	21.57	***	0.57	0.27	***	0.02	0.09	***	0.09	0.13	***	0.04	0.03	*	0.04	1.46	***	0.04	0.14	***
India	58.63	118.78	***	0.18	0.12	***	0.07	0.21	***	0.12	0.10	*	0.02	0.02		3.53	2.91	**	0.75	0.18	***
Indonesia	62.51	45.71	***	0.19	0.20		0.08	0.13	***	0.12	0.11		0.01	0.00	***	1.80	4.11	***	0.44	0.36	
Korea	70.07	152.27	***	0.18	0.21	***	0.27	0.31	**	0.07	0.09	**	0.01	0.01	***	18.80	31.40	***	0.84	1.08	**
Malaysia	55.32	90.17	***	0.19	0.19		0.64	1.70	***	0.09	0.09		0.01	0.01	***	7.77	51.72	***	0.13	0.33	***
Mexico	34.13	66.56	***	0.16	0.26	***	0.07	0.23	***	0.19	0.11	***	0.07	0.02	***	2.41	9.85	***	0.71	0.46	***
Pakistan	52.50	71.00	***	0.16	0.15	*	0.05	0.15	***	0.09	0.11	**	0.01	0.02	***	0.42	3.25	***	0.08	0.36	***
Philippines	18.00	32.82	***	0.31	0.29	*	0.05	0.25	***	0.14	0.13		0.02	0.02		1.56	4.73	***	0.30	0.19	***
Portugal	30.02	31.38	*	0.22	0.20	***	0.11	0.14	***	0.09	0.07	**	0.04	0.04		1.82	3.20	***	0.20	0.31	***
Taiwan	57.58	84.13	***	0.19	0.16	***	0.62	0.50	*	0.11	0.08	***	0.01	0.01	***	172.44	100.03	***	2.84	1.97	***
Thailand	9.72	37.90	***	0.32	0.23	***	0.04	0.21	***	0.08	0.11	***	0.02	0.01	***	2.12	14.23	***	0.49	0.71	**
Turkey	15.14	27.95	***	0.23	0.25		0.03	0.12	***	0.17	0.18		0.02	0.03	**	0.23	3.90	***	0.10	0.55	***
Venezuela	15.25	16.70	***	0.25	0.34	***	0.10	0.07	***	0.16	0.12	**	0.04	0.09	***	3.12	1.09	***	0.33	0.18	***
Mean ^a	35.14	56.70		0.24	0.22		0.15	0.29		0.13	0.12		0.16	0.11		13.70	14.74		0.50	0.47	
P-value		0.03			0.22			0.11			0.24			0.24			0.47			0.44	
Mean ^b	31.78	59.82		0.26	0.23		0.08	0.16		0.14	0.13		0.07	0.04		3.43	7.02		0.42	0.39	
P-value		0.05			0.24			0.02			0.33			0.25			0.16			0.42	
P-value ^a , FE	0.02			0.20			0.00			0.20			0.36			0.00			0.01		
P-value ^b , FE	0.00			0.06			0.00			0.86			0.64			0.07			0.03		
P-value ^a JS	0.00			0.00			0.00			0.00			0.00			0.00			0.00		
P-value ^b , JS	0.00			0.00			0.03			0.00			0.00			0.00			0.00		

^aExcludes Philippines which has a break down in capital flows

^bExcludes Philippines and countries with breaks that are not significant.

Test Statistics are detailed below:

Sig. indicates the Newey-West corrected T-stats on the univariate regression:

$$\text{Series} = B0 + (\text{Indicator for Five Years After Break}) * B1$$

FE indicates the T-stat significance on a panel estimation with fixed effects of the regression:

$$\text{Series}[i,t] = B0[i] + (\text{Indicator for Five Years After Break})[i,t] * B1$$

JS indicates the Chi-Square joint test that all of the coefficients are zero in the pooled time series regression with fixed effects:

$$\text{Series}[i,t] = B0[i] + (\text{Country Specific Indicator for Five Years After Break})[i,t] * B1[i]$$

All multivariate regression tests are corrected for group-wise heteroskedasticity and group-wise moving average processes in the residuals.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table 4

Macroeconomic Indicators

Country	Real GDP per Capita Growth		Average (Exp. + Imp.)/GDP (%)		Average Trade Surplus/GDP (%)		Average Inflation (Annual %)		Interest Rate (Lending) ^a		Real Exchange Rate		External Debt (% GDP)		Long Term Ext. Debt (% GDP)		Government Surplus (% GDP)	
	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after	5 yrs before	5 yrs after
Argentina	0.757	1.314	19.45	26.56 ***	0.63	3.43	1410.35	4.87 ***	3822.78	10.42 ***	95.08	50.72 ***	47.1	29.0 ***	37.4	24.2 ***	-0.78	0.00 ***
Brazil	2.404	-1.741 ***	15.57	18.97 ***	3.29	-1.31	220.88	1475.31 ***	304.35	3867.19 ***	187.06	125.11 ***	44.1	30.1 ***	37.9	24.4 ***	-10.01	-7.76 *
Chile	2.783	5.779 ***	55.94	67.42 ***	3.18	-0.54	23.50	19.08 ***	36.20	31.70 **	94.66	100.12 *	108.1	61.8 ***	92.0	49.1 ***	-1.67	1.22 ***
Colombia	1.795	3.510 ***	34.76	46.82 ***	-2.56	4.37	27.56	22.05 ***	42.26	40.56	96.97	72.10 ***	39.7	28.7 ***	35.1	21.9 ***	0.36	-0.55 **
Greece	0.852	1.161	42.91	61.93 ***	-6.94	0.29	20.51	16.73 ***	20.51	24.80 ***	138.25	109.39 ***	NA	NA	NA	NA	-12.65	-20.28 ***
India	3.137	3.673	15.18	17.87 ***	-0.49	0.59	9.87	9.09	17.25	16.30	99.08	97.30	30.5	32.9	26.7	30.1	-7.09	-6.29 **
Indonesia	6.103	5.788	42.89	47.27 ***	-0.13	-1.10	7.91	9.19 ***	21.90	18.34 ***	109.47	135.56 ***	60.8	55.1 ***	50.3	44.4 ***	-0.59	0.61 ***
Korea	6.832	6.604	75.44	90.11 ***	3.90	4.55	7.32	5.17 ***	10.23	8.70	100.76	100.84	NA	NA	NA	NA	-0.25	0.31 ***
Malaysia	5.540	6.046 *	140.16	182.51 ***	5.82	6.21	2.71	4.26 ***	7.62	8.47	106.47	94.55 ***	47.3	39.8 ***	42.0	31.0 ***	-1.41	1.87 ***
Mexico	-1.041	0.281	35.61	51.00 ***	3.28	9.16	81.03	16.14 ***	66.39	19.28 ***	90.38	95.29 ***	61.6	39.3 ***	54.5	28.3 ***	-10.25	NA ^{ne}
Pakistan	2.534	0.590 ***	31.77	34.08 ***	-1.73	1.19	9.59	11.45 ***	NA	NA	98.63	105.75 ***	48.9	50.0 ***	39.0	43.1 ***	-7.03	-6.82 ***
Philippines	0.141	-0.284	52.62	70.43 ***	1.15	4.37	10.06	11.77 ***	18.92	19.30 ***	98.79	91.42 *	83.0	66.3 ***	63.7	54.4 ***	-2.89	-2.06 ***
Portugal	0.019	1.594	83.00	94.18 ***	10.75	15.41	9.76	3.91 ***	20.12	14.33 ***	96.48	92.18 *	NA	NA	NA	NA	-4.21	NA ^{ne}
Taiwan	4.349	5.281	80.27	75.93 ***	8.78	3.47	3.28	3.55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA ^{ne}
Thailand	4.801	8.687 ***	53.18	77.91 ***	-2.06	2.93	2.38	4.90 ***	17.22	16.63	98.57	98.98	39.8	35.2 ***	30.2	24.4 ***	-3.35	3.24 ***
Turkey	2.436	1.726 **	32.61	40.74 ***	-0.95	3.79	50.85	72.10 ***	45.47	65.55 ***	131.52	105.68 ***	42.4	38.0 ***	34.1	30.2 ***	-3.63	-4.61 ***
Venezuela	0.319	-2.588 **	47.00	49.56 ***	-1.82	-8.32	46.33	65.35 ***	33.08	39.30 **	93.85	79.31 ***	66.1	55.5 ***	55.3	46.5 ***	-0.33	-4.14 ***
Mean ^b	2.73	2.98	50.36	61.43	1.43	2.76	21.61	18.78	28.19	25.33	104.24	99.00	53.04	41.28	44.54	33.12	-4.19	-3.32
P-value		0.40		0.20	0.22	0.37	0.37	0.17	0.16	0.17		0.16		0.03		0.34		0.00
Mean ^c	2.24	2.15	37.09	47.48	-0.45	1.69	25.57	18.86	29.56	23.65	102.06	94.87	47.23	37.59	39.52	30.35	-5.14	-4.70
P-value		0.47		0.15		0.12		0.29		0.03		0.02		0.04		0.44		0.00
P-value ^d , FE		0.76		0.00		0.62	0.41	0.41	0.37	0.37		0.58		0.00		0.00		0.75
P-value ^e , FE		0.85		0.00		0.70	0.29	0.29	0.24	0.24		0.92		0.02		0.00		0.61
P-value ^f , JS		0.99		0.00		0.66	0.23	0.23	0.00	0.00		0.00		0.00		0.00		0.00
P-value ^g , JS		0.98		0.00		0.77	0.10	0.10	0.00	0.00		0.00		0.01		0.00		0.00

*Deposit rates used for Argentina, Brazil, Mexico, and Turkey

^bExcludes Philippines which has a break down in capital flows^cExcludes Philippines and countries with breaks that are not significant.^dInflation and interest rate calculations exclude Argentina and Brazil.^eIndicates that the regression was not estimated due to data problems.

Taiwan is not included in some of the macroeconomic analysis because it is not a member of the IMF and we lack the relevant data.

Test Statistics are detailed below:

Sig. indicates the Newey-West corrected T-stats on the univariate regression:

Series = B0 + (Indicator for Five Years After Break)*B1

FE indicates the T-stat significance on a panel estimation with fixed effects of the regression:

Series(i,t) = B0[i] + (Indicator for Five Years After Break)(i,t)*B1

JS indicates the Chi-Square joint test that all of the coefficients are zero in the pooled time series regression with fixed effects:

Series(i,t) = B0[i] + (Country Specific Indicator for Five Years After Break)(i,t)*B1[i]

All multivariate regression tests are corrected for group-wise heteroskedasticity and group-wise moving average processes in the residuals.

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table 5 Country Risk											
Country	Institutional Investor's Country Credit Rating		ICRG Economic Index		ICRG Financial Index		ICRG Political Index		ICRG Composite Index		
	5 yrs before	5 yrs after <i>Sig.</i>	5 yrs before	5 yrs after <i>Sig.</i>	5 yrs before	5 yrs after <i>Sig.</i>	5 yrs before	5 yrs after <i>Sig.</i>	5 yrs before	5 yrs after <i>Sig.</i>	
Argentina	21.9	36.3 ***	21.2	32.4 ***	25.1	36.6 ***	62.4	74.0 ***	54.5	71.9 ***	
Brazil	32.7	27.5 ***	20.7	22.6 ***	23.9	32.2 ***	63.4	66.5 ***	54.1	60.8 ***	
Chile	28.1	36.4 ***	23.9	31.6 ***	25.6	39.1 ***	45.9	62.0 ***	47.9	66.5 ***	
Colombia	36.4	44.4 ***	33.3	34.9 ***	35.3	38.4 **	56.4	58.0	62.6	65.1 *	
Greece	53.1	47.5 ***	30.0	30.1	25.9	29.9 ***	60.7	61.8 *	58.5	61.1 ***	
India	47.7	51.7 ***	35.1	36.7 ***	35.0	40.2 ***	49.5	63.4 ***	49.4	67.0 ***	
Indonesia	43.7	42.6	28.8	34.9 ***	27.7	36.4 ***	42.3	63.0 ***	60.6	69.8 ***	
Korea	67.3	70.4 ***	37.7	40.6 ***	47.2	46.5 ***	66.8	77.3 ***	76.1	82.0 ***	
Malaysia	32.3	44.3 ***	27.4	31.2 ***	31.9	40.4 ***	67.9	68.7	69.8	79.8 ***	
Mexico	58.4	63.7 ***	38.7	40.9 ***	30.8	44.2 ***	62.8	70.8 ***	58.2	70.5 ***	
Pakistan	29.5	29.4	31.7	31.1 **	23.1	32.7 ***	34.7	54.2 ***	44.9	59.2 ***	
Philippines	22.2	27.0 ***	28.6	31.5 ***	21.6	29.1 ***	42.4	48.5 ***	46.5	54.6 ***	
Portugal	64.5	67.9 ***	39.3	41.5 ***	42.8	43.2	71.2	80.6 ***	76.8	82.7 ***	
Taiwan	77.0	78.8 ***	43.5	43.5	48.2	47.3	75.2	78.6 ***	83.6	85.2 ***	
Thailand	53.1	60.6 ***	35.1	37.0 ***	29.6	41.6 ***	56.9	59.5 ***	61.0	69.1 ***	
Turkey	38.7	43.3 ***	27.8	28.0	24.1	29.6 ***	52.5	57.0 **	52.3	57.4 ***	
Venezuela	36.0	33.6 ***	31.6	32.2	35.1	34.6	67.3	64.9 **	67.2	66.3	
Mean ^a	45.02	48.65	31.61	34.33	31.96	38.31	58.48	66.25	61.09	69.65	
P-value		0.26		0.11		0.01		0.02		0.01	
Mean ^b	43.61	46.51	31.50	33.85	31.10	37.69	58.08	65.01	58.64	67.31	
P-value		0.33		0.14		0.00		0.03		0.00	
P-value ^a , FE	0.22		0.00		0.00		0.00		0.00		
P-value ^b , FE	0.33		0.00		0.00		0.00		0.00		
P-value ^a , JS	0.00		0.00		0.00		0.00		0.00		
P-value ^b , JS	0.00		0.00		0.00		0.00		0.00		

^aExcludes Philippines which has a break down in capital flows

^bExcludes Philippines and countries with breaks that are not significant.

Test Statistics are detailed below:

Sig. indicates the Newey-West corrected T-stats on the univariate regression: Series = B0 + (Indicator for Five Years After Break)*B1

FE indicates the T-stat significance on a panel estimation with fixed effects of the regression:

Series[i,t] = B0[i] + (Indicator for Five Years After Break)[i,t]*B1

JS indicates the Chi-Square joint test that all of the coefficients are zero in the pooled time series regression with fixed effects:

Series[i,t] = B0[i] + (Country Specific Indicator for Five Years After Break)[i,t]*B1[i]

All multivariate regression tests are corrected for group-wise heteroskedasticity and group-wise moving average processes in the residuals.

*Significant at the 10% level.

**Significant at the 5% level.

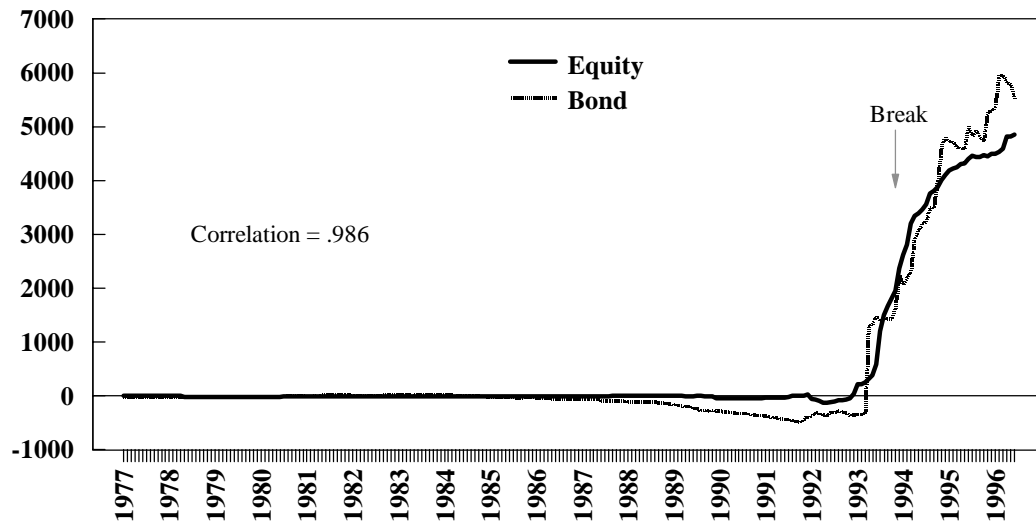
***Significant at the 1% level.

Table 6
Integration/segmentation portfolio analysis:
January 1987 to September 1994

Moment-Significant Countries	Segmented portfolio	Integrated portfolio
<i>Annunalized Mean %</i>	25.88	24.13
<i>Annualized Volatility %</i>	20.73	35.16
<i>Correlation with World</i>	0.132	0.355
<i>Beta with World</i>	0.174	0.771
Moment-All Countries	Segmented portfolio	Integrated portfolio
<i>Annunalized Mean %</i>	20.78	25.52
<i>Annualized Volatility %</i>	18.70	33.01
<i>Correlation with World</i>	0.365	0.320
<i>Beta with World</i>	0.423	0.652

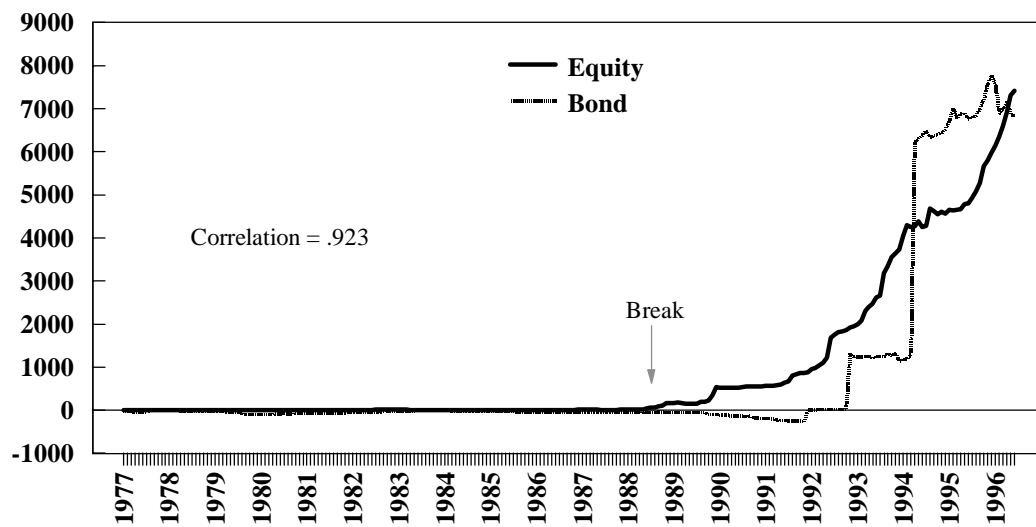
Significant countries include all countries in the analysis except for Chile, Turkey, Malaysia, Taiwan, Indonesia, Portugal. Philippines is always excluded.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Argentina



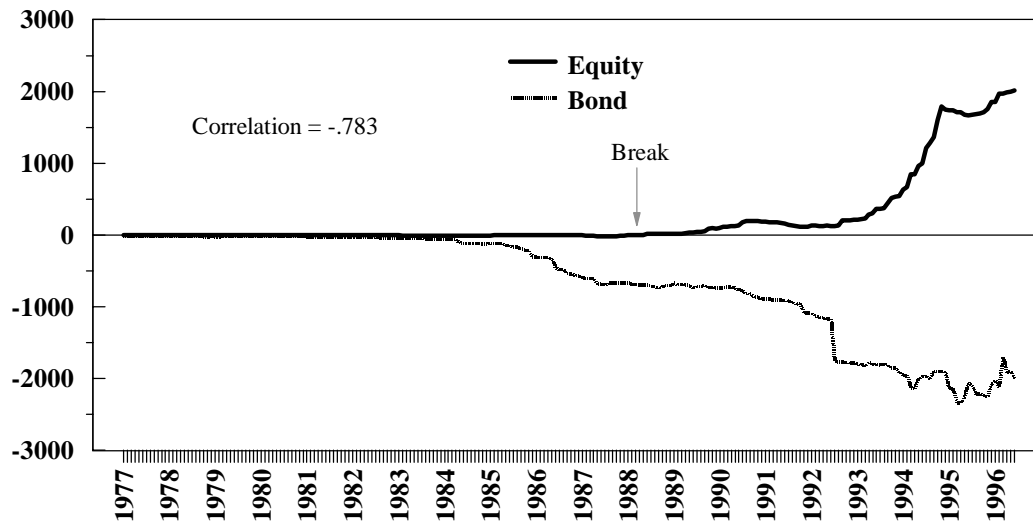
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Brazil



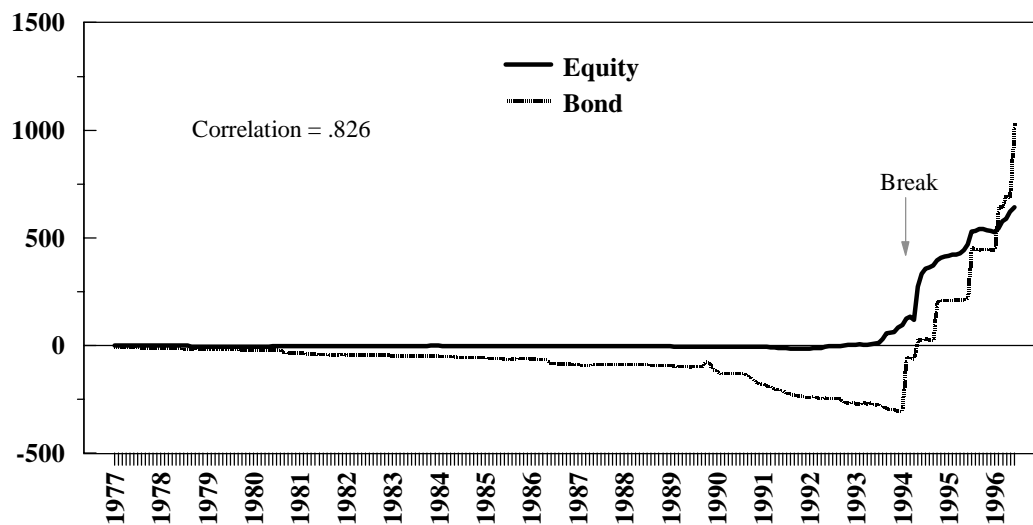
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Chile



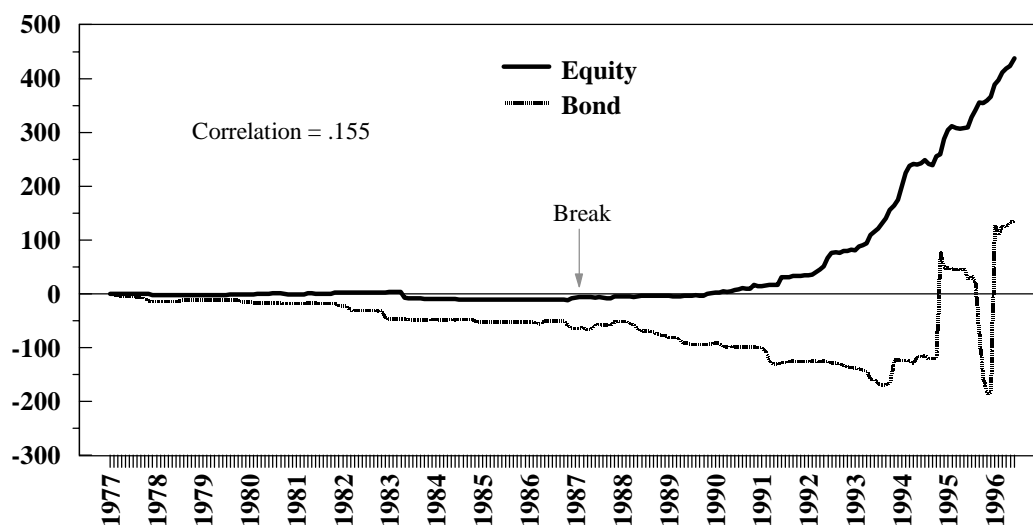
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Colombia



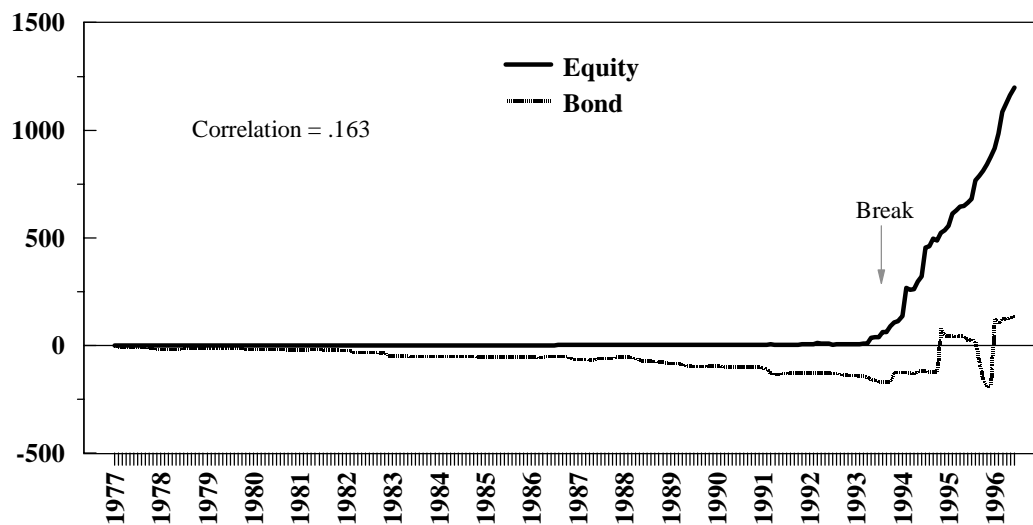
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Greece



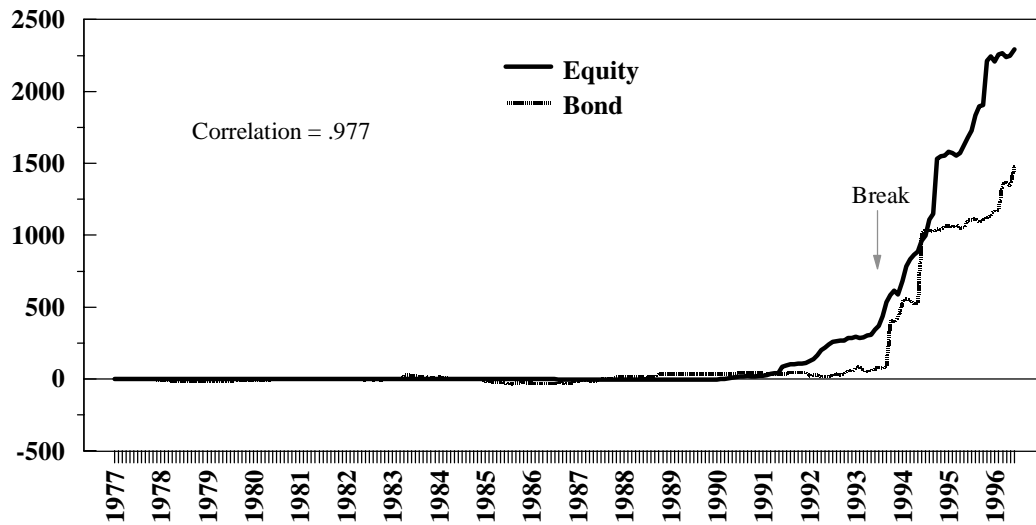
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
India



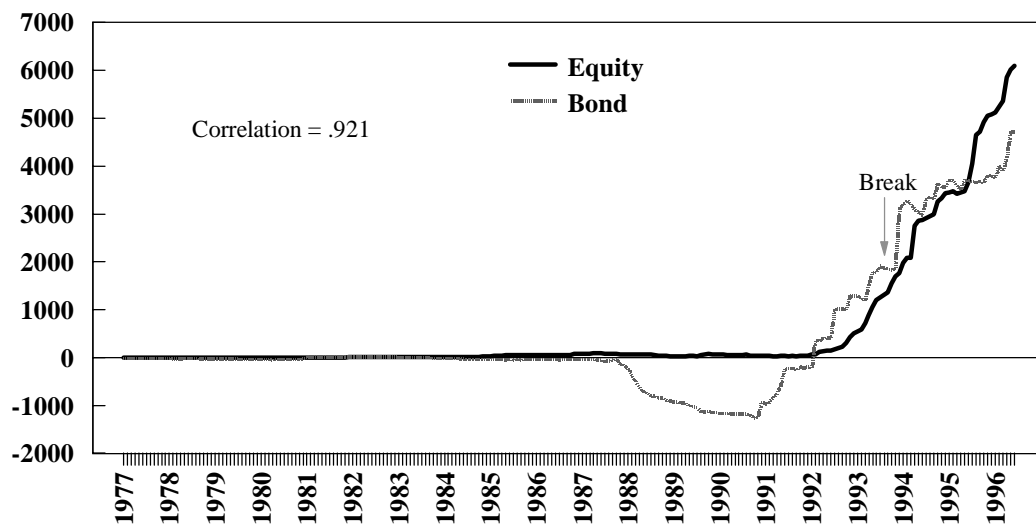
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Indonesia



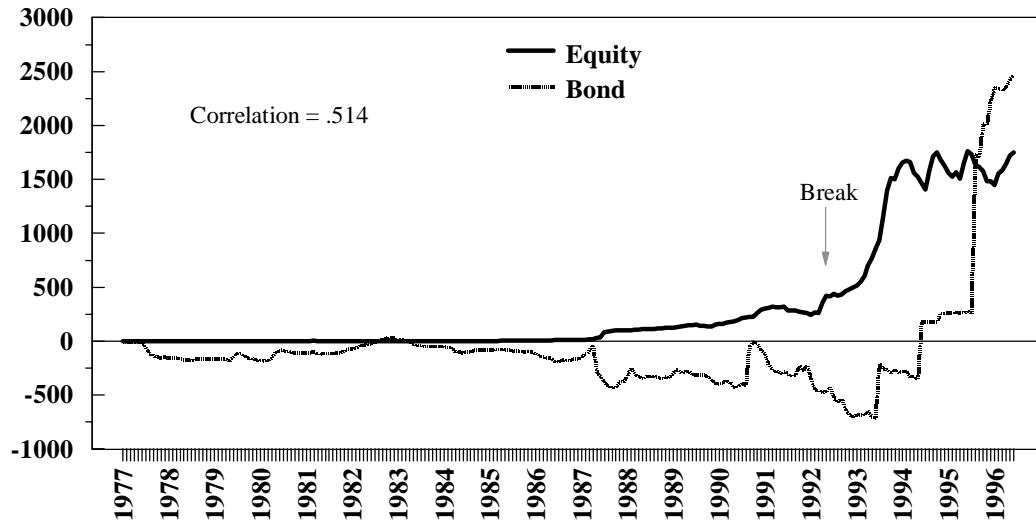
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Korea



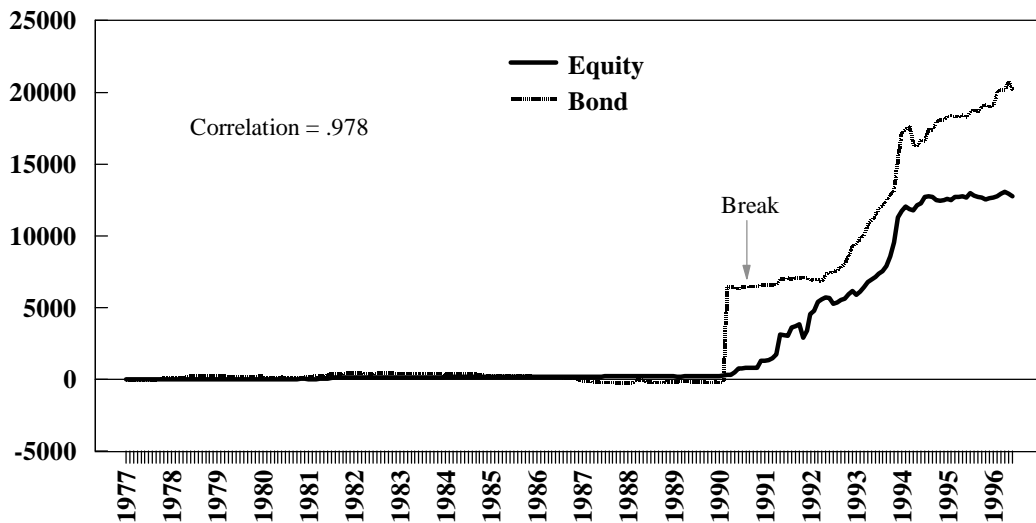
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Malaysia



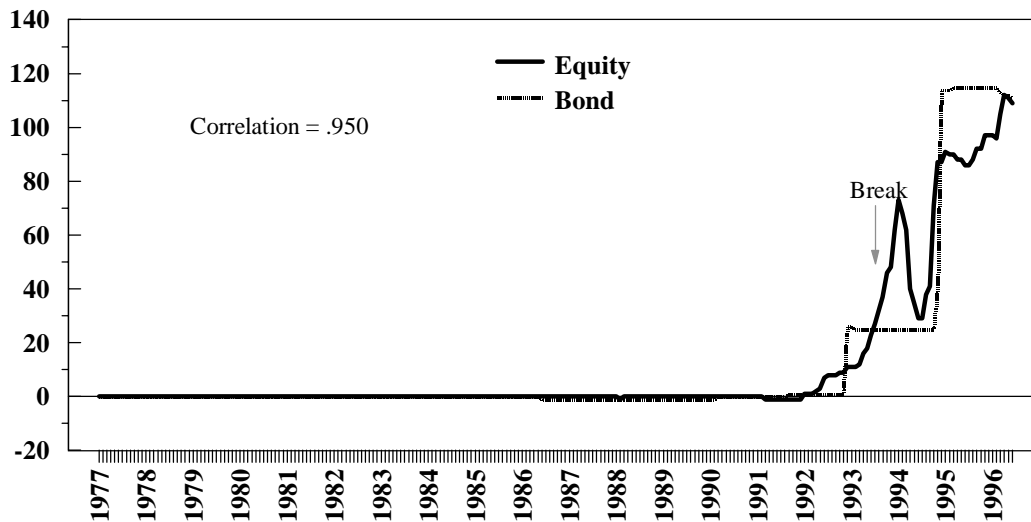
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Mexico



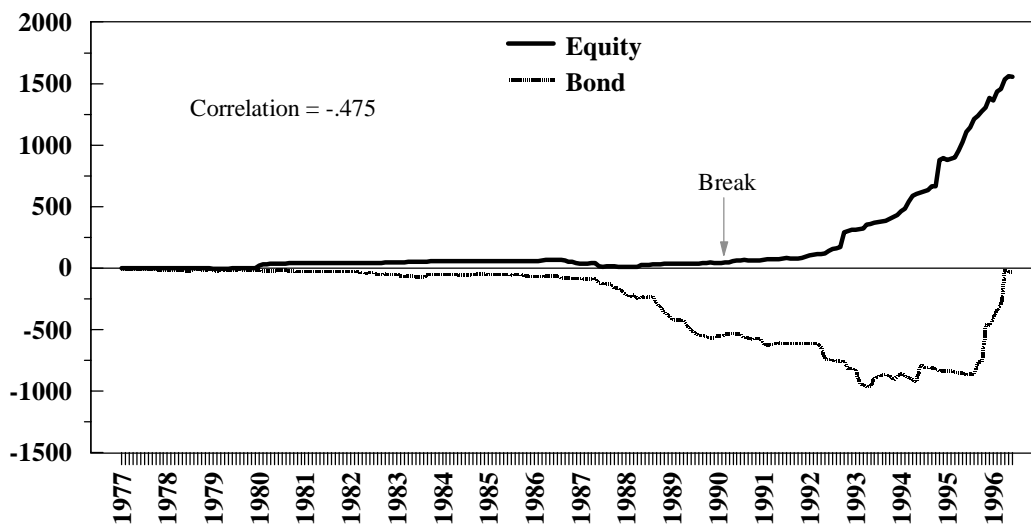
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Pakistan



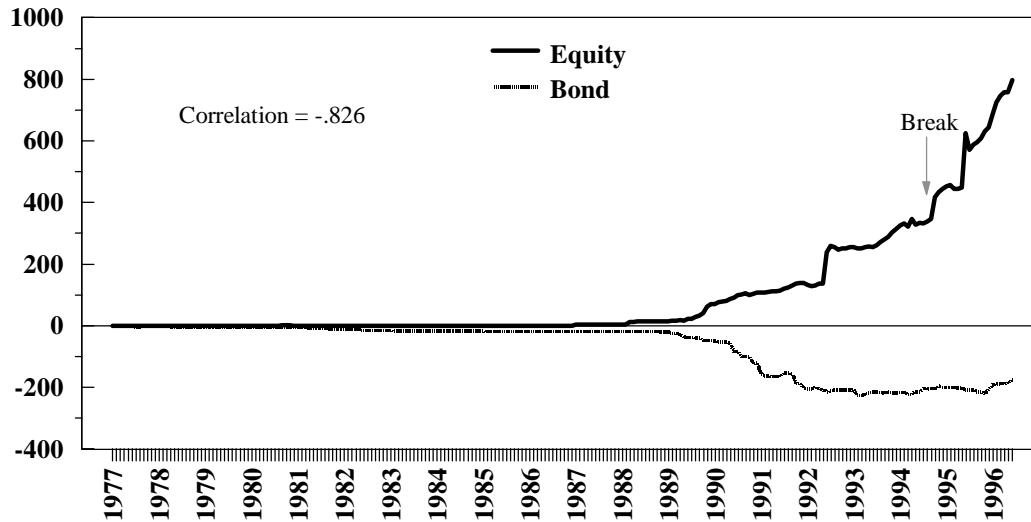
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Philippines



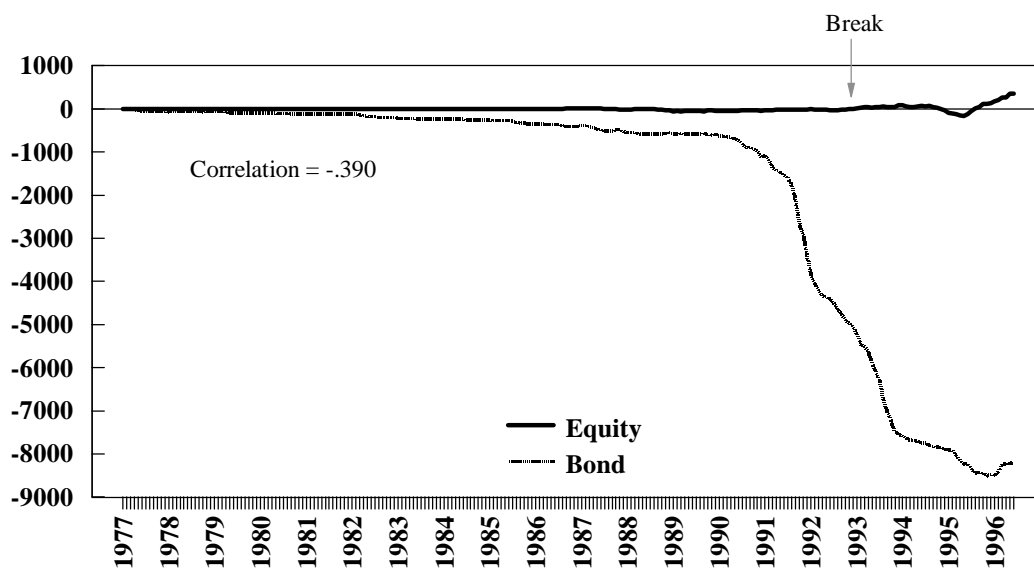
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Portugal



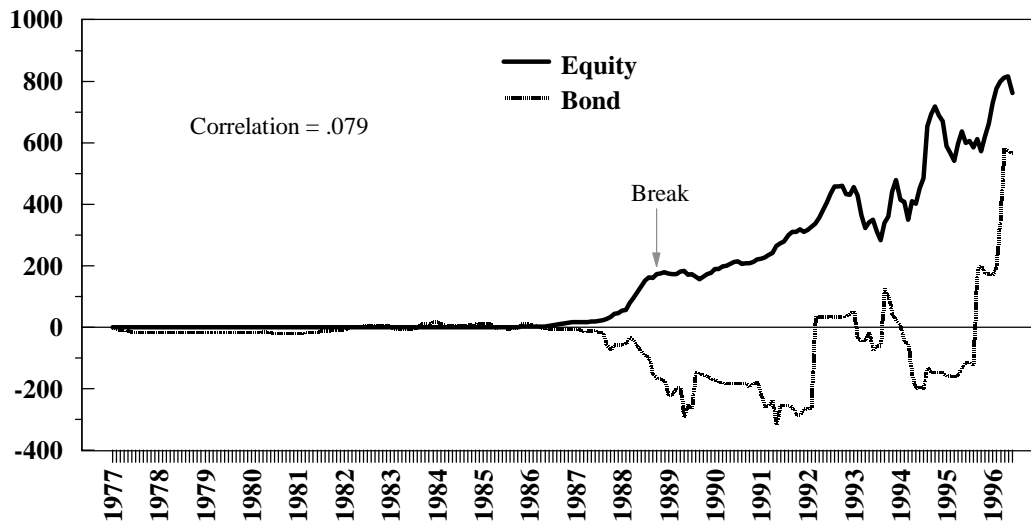
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Taiwan



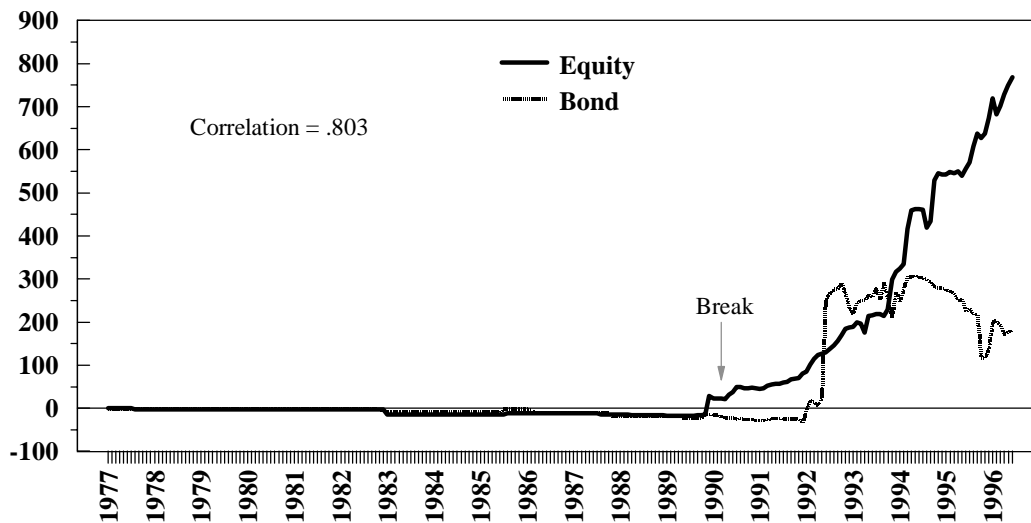
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Thailand



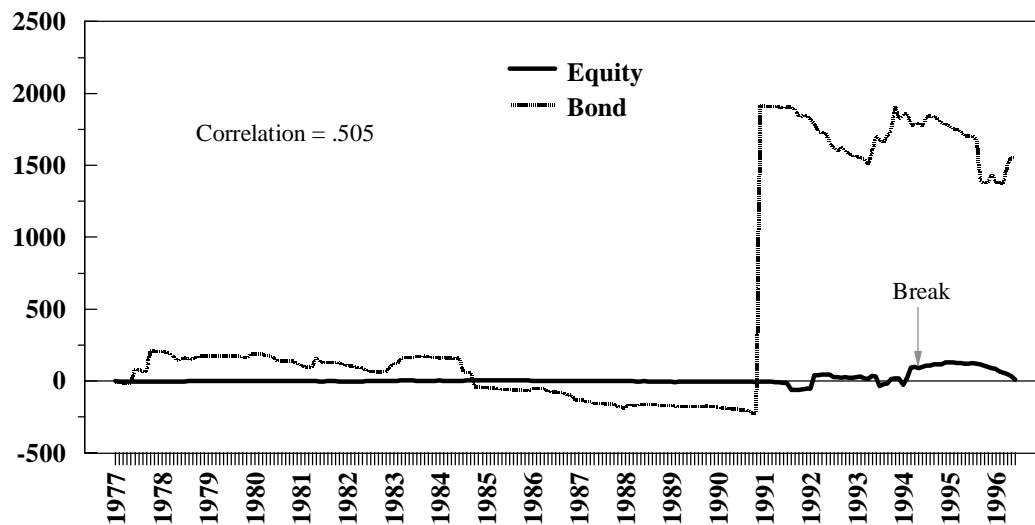
*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Turkey



*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.

Figure 1
Cumulative U.S. Net Equity and Bond Flows*
Venezuela



*U.S. \$ millions unadjusted for local returns. Equity breaks based on flows adjusted for market returns divided by market capitalization.