

Market Size Effects and Integration in Developed and Emerging Markets

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Abstract

This paper investigates market size effects for expected returns in a large set of developed and emerging markets over a time span of up to three decades. Using regression analysis we find that market size is a significantly priced factor and the effect dominates in emerging rather than developed countries. Further, we explore the relationship between size effects and the level of market segmentation in emerging countries. The size premium remains strong and persistent across periods over and above the segmentation premium documented in relation to the intensity of capital controls. The market size effect is strengthened with the degree of segmentation of emerging markets and amounts to almost 3% of global expected returns annually.

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1 Introduction

Emerging financial markets share resemble more developed mature countries in important ways. Expected returns in both developed and emerging markets appear driven by qualitatively similar factors among which momentum, size and value effects have received substantial evidence (see Fama and French (1998), Rouwenhorst (1999)). Commonalities in market behavior across many countries in different stages of development support the view that such factors could be linked to asset pricing in a fundamental way, rather than being abnormal and transitory market reactions.

Of these factors, size effects have been widely investigated using firm level data and the evidence, although not entirely of one voice, establishes them at the very least as a recognized factor in the cross-sectional analysis of returns. Interpretations of the evidence on size premium range from compensation for risk factors, firm characteristics, inefficiency in the way markets incorporate information into prices to survivorship biases or even data snooping (Rouwenhorst (1999)).

This paper addresses the question of size effects at country level in a comparative exercise across developed and emerging markets. Market size effects may be important for the strategic choices of international investors, that in an initial stage would assess countries rather than individual stocks. Evidence on market size effects is relatively scarce. The initial findings of Asness, Liew, and Stevens (1997) for market indices in developed countries have not been confirmed in other data sets analyzed by Bekaert, Erb, Harvey, and Viskanta (1997) and Harvey (2000).

Our focus on emerging countries and market indices rather than individual stocks allows us to engage in the debate on size effects from a relatively novel perspective, specifically the link between size effects and market integration. This has been formalized by Martin and Rey (2004). They develop an integrated model of international trade in assets, determinants of market capitalization and international relative asset prices. In their model, the market size effect is a demand size effect. In a larger country, having larger aggregate saving and a home bias in the demand for assets (induced by international transaction costs), the total demand for an asset is higher than the demand for an asset in the small country for a given price. The larger country will benefit from higher asset prices, more financial assets and more diversification per capita than the smaller country. As a consequence, the expected return is smaller in the large country than in the small country. Furthermore, financial integration (modeled as a decrease in international transaction costs) leads to an increase in asset demand and prices. Hence, when markets are perfectly integrated, size differences should not matter.

Emerging markets achieved substantial progress over the last decades and offer an ideal environment for establishing the potential relationship between market size and market integration. They have taken decisive steps towards market development and financial liberalization often as part of more committed economic reforms. Restrictions to foreign ownership of assets have been gradually lifted

in many emerging countries. Foreign capital has been quick to pick up on these changes in many countries. Strongly correlated to the (growing) market share that is open to foreign investors, average market capitalization increased by more than 25% per year.

Financial liberalization and market integration should trigger a chain of positive effects. Efficient sectors as well as sectors with high diversification potential should absorb domestic and foreign capital and expand accordingly. The larger asset demand will lead to an increase in prices and hence lower cost of capital. Ultimately, higher investment is expected to increase welfare (see Bekaert and Harvey (2003)).

Empirical evidence has shown robustly that market liberalization leads to lower expected returns. Bekaert and Harvey (2000) and Henry (2000) by focus on dates of liberalization and regard them as structural breaks in the data in order to test for the effects of liberalization. However, it has been argued that the process of market opening is often gradual and more nuanced (see Edison and Warnock (2003), Bae, Chan, and Ng (2004) and De Jong and De Roon (2005)). These studies use an alternative measure of financial liberalization that accounts for the gradual availability of emerging markets to foreign ownership, i.e. the intensity of capital controls. The measure is based on the share of the market that is available to foreign investors relative to the total market capitalization. Using this continuous measure of liberalization induces an even stronger effect on expected returns.

At the same time, financial liberalization has a secondary (indirect) effect on expected returns, through increasing the country's systemic risk, i.e. its beta relative to the world market portfolio. Bekaert and Harvey (2000) find that post-liberalization world market betas are higher and De Jong and De Roon (2005) show that betas increase as countries become less segmented from the world market. The increase in world market betas has an opposite effect on expected returns than the direct segmentation effect, but the latter dominates empirically.

In this paper we show that there is a robust relationship between expected returns and market size, over and above the documented impact of direct market segmentation. Market size appears to be a useful proxy for economic integration. Bekaert and Harvey (2000) use the ratio of market capitalization over GDP to proxy for financial market development and Carrieri, Errunza, and Hogan (2002) find a positive relationship between this variable and their time-varying integration indices. We use the market capitalization of the domestic index as an absolute measure of market size and investigate size effects on expected returns for two groups of countries: developed (OECD member states) and emerging markets over a time span of up to three decades. We use regression analysis and find that market size is a significantly priced factor, both statistically and economically. The effect dominates in emerging markets as opposed to developed countries and is strengthened with the level of segmentation of the country. This relationship remains strong and persistent across periods in the case of emerging markets, over and above established measures of time-varying integration of emerging countries such

as the intensity of capital controls. For the emerging markets group, the size effect on global expected returns amounts to 3% per year.

The remainder of this paper is structured as follows. Section 2 gives a brief review on the debate over size effects at firm and country level. Section 3 presents the data sets used in this study, for developed and emerging markets. Section 4 discusses our methodological choices for investigating the effects of market size on expected returns, while Section 5 reports empirical evidence on the presence of size effects comparing developed and emerging markets. Finally, Section 6 summarizes our main findings.

2 Firm Size and Market Size Effects

Small firms tend to have, on average, higher risk-adjusted returns than large firms. This is the well-known size effect as introduced in the original paper of Banz (1981). The size effect is confirmed as one of the “most prominent empirical contradictions” of the CAPM in the classical contribution of Fama and French (1992) who document a strong negative relationship between size and average returns in a sample of US firms over the 1963-1990 period. This effect has been subsequently sought in other markets and over different periods of time. The results of this search continue to keep size effects in the the spotlight without however being uniform. Malkiel and Xu (1997) construct portfolios based on size deciles and confirm the finding of Fama and French (1992) that portfolios of smaller companies outperform portfolios of larger companies. They conjecture that size may be a better proxy for risk than beta. In their view, size is inversely related to a stock’s idiosyncratic volatility, which, far from being irrelevant (as diversifiable in a portfolio), could serve as a useful proxy for a wide range of systematic risk factors associated with an arbitrage pricing model.

Other studies also identify important size effects. Heston, Rouwenhorst, and Wessels (1995) investigate pricing differences of large versus small firms on a sample of 6000 securities from the United States and 12 European countries and find that in nearly every country, larger firms appear to enjoy a lower cost of capital that is not explained by exposure to systematic risk. Fama and French (1998) investigate size and value effects in 13 developed markets (for the 1975-1995 period) and 16 emerging countries (from 1988 to 1995), using firm level data. They find evidence of size effects in 11 of the 16 emerging markets. Yet, there is reasonable doubt. Their database overlaps to a certain extent with the data used by Claessens, Dasgupta, and Glen (1998) for 19 emerging countries over the period 1986-1993, who find a positive relationship between size and returns, hence the *opposite* of a size effect. For a sample of 1700 emerging market firms from 20 countries, Rouwenhorst (1999) shows that size effects are certainly not even across the countries in the sample. The return premium has the ‘correct’ sign in only 12 out of the 20 countries, and 4 of the 5 countries with the largest size returns, are from Latin America. However,

an internationally diversified portfolio small stocks significantly outperforms a portfolio of large stocks by about 70 basis points per year, irrespective of whether securities or countries are equally-weighted.

Building evidence against size effects, Estrada (2000) finds a positive but not statistically significant relationship between size and returns, on a sample of 28 emerging countries for data series with varying lengths between 1988-1999 from the Morgan Stanley Capital Indices. In a study that investigates the cross-sectional determinants of emerging markets, Serra (2002) uses (weekly) individual stock series from EMDB for the period 1990-1996 and finds that in 18 out of 21 emerging markets, size effects are positive, and in 10 countries the effects are statistically significant. Another related study using firm level data on a broad sample of emerging countries and a portfolio selection strategy, by Hart, Slagter, and Van Dijk (2003) finds a size effect on a full sample that disappears once a minimum capitalization requirement is imposed. In a comprehensive study on the the robustness of size and book-to-market effects in 35 emerging equity markets during 1985-2000 by Barry, Goldreyer, Lockwood, and Rodriguez (2001), size effects are also not robust to removing observations with returns in the upper or lower 1% tails of the distribution of returns.

Contrary to firm size effects that have been widely recognized and extendedly debated in the literature, country size effects received little attention. An international study by Asness, Liew, and Stevens (1997) using firm level data for the US and country indices for developed markets included in the MSCI world index (with the exception of Finland, Ireland, New Zealand and Malaysia) finds similarities between US and the other developed markets regarding the size effect for a period starting in the early 1970s and finishing in 1994. Their study shows that country portfolios constructed based on market size characteristics has the same pattern as stocks portfolios for US data, with large and statistically significant difference in favor of the small size portfolios. These results, however are not confirmed by subsequent studies. Bekaert, Erb, Harvey, and Viskanta (1997) examine the performance of different portfolio strategies based on several risk attributes, among which the size of the market capitalization, but fail to find a consistent size effect. A later study using also country indices (Harvey (2000)) analyses a list of 18 risk factors for 47 international developed and emerging stock markets, grouped as: ‘developed’, ‘emerging’ and ‘all countries’, over the period 1988-1999. Size, measured as the logarithm of market capitalization does not appear very informative as a risk factor in this setting. The results show a slightly positive yet statistically insignificant relationship between size and returns for emerging countries and virtually no size effects for the ‘all countries’ and the ‘developed markets’ groups.

3 Data

3.1 Return Indices and Global Risk Factors

We obtain from Standard & Poor's Emerging Market Database, monthly data on price indices and market capitalization figures in US Dollars for a panel of 31 emerging markets as well as several aggregate indices: a Composite Index for all the countries in the dataset and regional indices for Asia, Europe-Mid-East-Africa (EMEA), Europe, Eastern Europe, Latin America and Mid-East-Africa (MEAF). The dataset covers the period December 1975-February 2005, though for a number of countries and variables of interest, coverage starts later, specifically December 1989. For the 29 OECD countries, we compute monthly US Dollar total returns and obtain market capitalization figures over the period January 1973 - June 2006, based on Datastream's total market indices. The risk-free rate is the one-month Treasury Bill rate from Ibbotson and Associates Inc., available on Kenneth French's website¹ and Morgan Stanley Capital International (MSCI) World Market Returns in US Dollars are taken as a proxy for the global market returns.

We also construct a set of global economic risk variables similar to the ones constructed by Ferson and Harvey (1993), including:

1. *Currency Risk, FX*, the percentage change in a broad index of foreign exchange value of the US Dollar against a trade-weighted basket of currencies of important trading partners of the US². The index reflects the price of the US Dollar in terms of the foreign currencies basket and a higher value corresponds to an appreciation of the US Dollar. We use the price-adjusted alternative of the index, with nominal exchange rates deflated by respective Consumer Price Indices (CPI) of US and the countries of reference.
2. *Inflation Risk, G7 INFL*, the monthly change in the weighted average of the CPI of the G7 countries (Canada, France, Germany, Italy, Japan, UK and US), where the weights are given by their relative GDP shares.
3. *Interest Rate Risk, G7 IR*, a proxy of global investment opportunities, computed as a weighted average of short term real interest rates in G7 countries (with weights given by their shares in the G7 GDP).
4. *Global Credit Risk, CR RISK*, the percentage change in the spread between the 3-month rate and the 3-month US Treasury Bill yield.

¹http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

²The broad index of the dollar's foreign exchange value includes 35 currencies until the introduction of the euro, and 26 currencies representing important trading partners for the US, after 1999 (see Leahy (1998)).

5. *Global Output Risk, G7 PROD*, the percentage change in the monthly Producer Price Index (PPI) for the manufacturing sectors in *G7* countries.
6. *Oil & Gas*, the change in the monthly World Price Index for oil and gas, as a measure of economic risk.

The currency risk, *FX*, is computed based on the the price-adjusted broad index of the US Dollar's foreign exchange, developed by the Federal Reserve. All other risk variables are computed using data from Datastream.

For emerging markets, we use two other country specific variables. First, we use a measure of composite country risk taken from the International Country Risk Guide (ICRG). ICRG produces monthly risk indices based on political, financial and economic factors as well as a composite index, a linear combination of the former three, where political risk (associated with the country's willingness to pay) accounts for 50% of the composite index and financial and economic risk (reflecting the country's ability to pay) have each a weight of 25% in the aggregate index. A higher value of the index is associated with lower risk. The ICRG methodology is described in Erb, Harvey, and Viskanta (1996). Second, we use a direct measure of segmentation of emerging markets, namely the intensity of capital controls, presented in full detail in the next section.

3.2 The Intensity of Capital Controls and Market Size

Capital controls - most specifically restrictions to foreign ownership - are quantified in a unitary fashion for a large number of emerging countries in Standard and Poor's Emerging Markets Database through two categories of indices, the S&P Global Index and the Investable Index. The Global Index captures the overall stock market performance of emerging countries without taking into account restrictions on foreign investors' ownership of equities. It considers all actively traded securities and aims to cover 60% to 75% of the total market capitalization of a country, after exclusions due mainly to government ownership and cross-holdings of other constituents to avoid double counting. The Investable Index is constructed to reflect the international availability of emerging markets to foreign investors. It is a fraction of the Global index trimmed based on several rules. First, it includes only stocks that pass a \$50 million threshold for investable market capitalization and whose traded value exceeds \$20 million annually. Second, market level constraints (reflecting the ability of foreign investors to buy and sell shares and repatriate capital, capital gains and dividend income) as well as industry and corporate level restrictions of foreign ownership are taken into account. The restrictions are synthesized in an individual 'investable weight factor' between 0 and 1 that quantifies the extent to which the constituting stocks are available for foreign ownership. These direct barriers to foreign ownership create an internal division in the emerging financial markets between an internationally open submarket (where foreign investors are

allowed to invest) and a restricted market operating exclusively for the domestic investors. The Global and Investable Indices provide an objective measure of the intensity of capital control (Edison and Warnock (2003)). The measure is given by the relative difference between the market capitalizations of the two indices, as follows:

$$I_{i,t} = 1 - \frac{MC_{i,t}^I}{MC_{i,t}^G}, \quad (1)$$

where $MC_{i,t}^G$, $MC_{i,t}^I$ are the market capitalizations at time t of country i 's Global and Investable Indices respectively. The intensity of capital controls takes values between 0 (perfect openness of capital market to foreign ownership) and 1 (complete segmentation of domestic capital market). We interpret this value as a proxy for direct market segmentation. We note however that, being derived from the investable indices, the intensity of capital controls essentially shows revealed foreign ownership restrictions. Many forms of capital controls such as taxes on capital inflows or unremunerated reserve requirements (such as the Chilean *encaje*) are not directly incorporated in this measure. This circumvents the problem of quantifying the effectiveness of various forms of capital controls but also makes the measure relevant particularly to capital markets rather than to other sectors of the economy. Moreover, the intensity of capital controls focuses directly on the availability of assets for foreign ownership whereas market integration occurs when foreign investors make effective use of the opportunity offered by the emerging market. To gain additional insight into the effective process of market integration, we compare the dynamics of the intensity of capital controls and of the market capitalization for the emerging countries in our sample.

Figures 1 to 5 show the parallel evolutions of the intensity of capital controls and market size, computed at aggregate (global or regional) as well as country levels. Table 1 reports summary statistics for both variables as well as the pairwise correlations between market segmentation and market size. The aggregate indices are computed for all countries (Composite) as well as several regions: Asia, Europe Mid East Africa (EMEA), Europe, Latin America and Mid East Africa (MEAF). The Composite intensity of capital controls is gradually declining to a low value of 0.22, whereas market size follows an opposite trend and increases tenfold over the period. The correlation between the two variables is strongly negative, -0.83 . Capital controls decrease Asia, whereas Europe, Mid East and Africa appear to slightly reverse the process of market integration. Latin America, as a region achieves gradually relatively low levels of segmentation (with respect to restrictions to foreign ownership) in the early 1990s and maintains this status in the following years. Both Asia and Latin America show strong negative correlations between market segmentation and market size. The individual countries make different choices with respect to opening up their markets. They can be classified in four major categories. Many countries (Argentina, Colombia, Egypt, Greece, Israel, Malaysia, Morocco, Peru, Poland, Portugal, Russia, Turkey, Slovakia and South Africa) have a medium/low and fairly stable

level of segmentation. Jordan, Philippines, Sri Lanka and Zimbabwe maintain relatively strict capital controls. The rest of the countries are divided over the way they choose to open up their market to foreign investors: the intensity of capital controls is gradually decreasing in Brazil, India, Taiwan and Venezuela and drops decisively in China, Chile, Czech Republic, Hungary, Indonesia, Korea, Mexico and Pakistan. The measure of market segmentation is negatively correlated with market size. Notable exceptions are Russia, Slovakia and the Czech Republic. In the Czech Republic, market size increases strongly only towards the end of the period, at a time when market segmentation is close to 0. whereas in Slovakia, market size declines at a similar pace with the measure of market segmentation. In Russia, market size and the intensity of capital control are fairly stable and move together for most of the period covered.

4 Econometric Analysis

4.1 Time Series Analysis

We use time series regressions for a preliminary investigation of the relationship between expected returns and the size of market capitalization for each country in our sample, in the following simple framework:

$$r_{d_t} - r_{f_t} = \alpha + \beta(r_{w_t} - r_{f_t}) + \gamma f(size_t) + \varepsilon_t, \quad (2)$$

where r_d are (monthly) returns on the domestic market index for each developed and emerging country in our dataset, r_w are the returns on the World Market Index, r_{f_t} is the risk free rate and α and ε_t are respectively the intercept and the disturbance term. $f(size_t)$ is given by the logarithm of the country's market capitalization and the size effects are estimated by the coefficient $\hat{\gamma}$.

The time series dimension allows us to test whether the inverse relationship between market size and expected returns holds within each market. At any point in time, market size can be interpreted as the demand of assets both from domestic and foreign investors in a given country. A negative relationship between market size and returns, shows that as the market size increases, the 'size premium' for that market is eroded.

4.2 Panel Data Analysis

Market size effects are relevant in cross-country comparisons, especially when interpreted as evidence of market segmentation. In order to take advantage both of the cross-sectional and time-series dimension of the data, our main regression framework uses panel data models, allowing for country fixed effects.

The basic model results in a fixed effects panel regressions of domestic (monthly) excess returns on

the (excess) returns on the World Market Index and a ‘size’ factor:

$$r_{d_{it}} - r_{f_t} = \alpha_i + \beta(r_{w_t} - r_{f_t}) + \gamma f(size_{it}) + \varepsilon_{it}, \quad (3)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. The size effects are represented by the coefficient $\hat{\gamma}$. $f(size)$ is a function of the country’s market capitalization: the rank in the sample of all countries. To compute the rank-based measure of market size for a given country in any given month, we normalize the highest value of the market capitalization in the panel to 1 and we rescale all the other market size figures accordingly.

We estimate this model separately for two groups of countries: developed (OECD member states) and emerging markets, for the entire sample period as well as for five year subperiods.

As a further step we check whether size effects are robust to the inclusion of a set of control variables linked to global economic risks, similar to those proposed by Ferson and Harvey (1993). We test the following extended model:

$$r_{d_{it}} - r_{f_t} = \alpha_i + \beta(r_{w_t} - r_{f_t}) + \gamma f(size_{it}) + \delta X_t + \varepsilon_{it}, \quad (4)$$

where X_t includes: currency risk, FX , inflation risk, $G7 INFL$, interest rate risk, $G7 IR$, global credit risk, $CR RISK$, global output risk, $G7 PROD$ and $OIL\&GAS$, the change in world prices for oil and gas as a measure of economic risk.

The previous models are aimed at isolating eventual market size effects on expected returns. In the context of emerging markets, we aim to establish whether the ‘size factor’ influences expected returns above the documented effects of market segmentation. The intensity of capital controls is a direct proxy of market segmentation for emerging countries that maintain restrictions to foreign ownership. A significant segmentation premium has been identified in emerging markets, as high segmentation levels are associated with high expected returns (De Jong and De Roon (2005)). We test the robustness of the size effects in emerging markets by including two country specific variables: Q , the intensity of capital controls, an interaction term between size and the intensity of capital controls. We expect that the relationship between the intensity of capital controls, which measures directly the share of the market that is not available to foreign investors and market size as proxies for integration, goes from particular to general. Market size may contain information on the process of integration above mere restrictions to foreign ownership, as a larger (more developed) market could be associated with lower direct and informational costs and a more active presence of foreign investors. In consequence, we expect the size effects to be strengthened with the level of segmentation.

5 Empirical Results

5.1 Country Level Size Effects

We estimate the effects of market size on expected returns over time, using equation 2, individually for all developed and emerging countries in our sample. Table 2 reports the sign and statistical significance of country size effects for each emerging market in our sample as well as for 7 composite indices. We test for the existence of size effects in emerging markets on three return indices: the index of returns on investable assets, the index of returns on non-investable assets and the global index, comprising all assets (investables and non-investables) available in an emerging market. Most countries and groups of countries exhibit negative size effects: 29 (respectively 27) countries out of 31 for investable (non-investable) indices and 29 out of 33 for global indices. The effects are statistically significant in a considerable number of cases: 15 for the investable indices and 13 for returns on non-investables and global indices. Among the regional return indices, only the Mid East Africa Index shows a positive and significant relationship between market size and expected returns. The Composite (All Countries) Index as well as the indices for Latin America, Asia and Europe produce consistently negative size effects. As the size of the domestic market increases, the small market premium appears to be eroding.

By comparison, the search for size effects in developed markets over time produces inconclusive results. For most of the OECD countries, the coefficients are not statistically significant and we find virtually equal numbers of positive and negative estimates of size effects.

The contrast between size effects over time in emerging versus developed countries, suggests that market size contains relevant information on certain barriers to integration that might have been already circumvented in developed markets.

5.2 Aggregate Size Effects for Developed and Emerging Markets

We estimate our basic model relating expected returns to the World Market benchmark and a ‘size factor (equation 4) on panel data, thus imposing that the size effects are the same for every country in the panel. We interpret the estimate of the coefficient of the size effect as an average effect for the group of countries in the panel. Columns 1 and 2 of Table 4 provide panel data estimates of size effects for developed countries, using two functions of the market size: logarithm of the market capitalization and the rank-based measure. In both cases size effects have the correct sign (negative) but are statistically insignificant. As in the case of time-series regressions, the emerging markets tell a consistently different story. Size effects are present for all three indices, for returns on investable, non-investable and global assets and both economically and statistically significant. Columns 3 and 4 of Table 4 show the results for investable assets while columns 5 and 6 give the parallel results for returns on non-investable assets.

The estimates are obtained for a set of 31 countries for the period 1989-2005. Size effects are similar for the two types of assets, but are more pronounced for the investable indices. The estimates of $\hat{\gamma}$ of -11.88 for investable assets and respectively -10.53 for non-investable assets, combined with the average monthly increase in the normalized market capitalization by 0.023 imply an average decrease in monthly expected returns of 0.27% and respectively 0.24% . For a slightly larger set of countries (33) with data available for the 1975-2005 period, size effects are still present and statistically significant, but small in economic terms.

Firm level size effects are known to be elusive over time (see Brown, Kleidon, and Marsh (1983), for instance), so we proceed with re-estimating the basic equation (4) for 5-year subperiods. Table 5 reports the panel data estimates of size effects for OECD countries for 5-year subperiods. Even though in most cases size effects for developed countries are negative, they are rarely significant, with exceptions in the 2000-2005 periods and using the rank-based measure in 1975-1980 and 1990-1995. While the evidence for developed countries is feeble, emerging markets present a far more convincing picture. Table 6 shows the panel data estimates of size effects for emerging markets for three indices, investables, non-investables and global indices for three time 5-year subperiods from 1990 to 2005. Size effects are present in each of the three subperiods. Moreover, we interact the size variable with the intensity of capital controls and we find that the size effects remain predominantly significant and are intensified with the direct segmentation variable, Q . Size effects are stronger in the countries with a higher level of direct segmentation, given by the intensity of capital controls, which suggests a tight connection between market opening and development.

In an extended version of the model, we test for size effects in the presence of several global economic risk variables. We extend the model for emerging markets to accommodate two specific variables: composite (political, economic and financial) risk and the segmentation measure, Q . Table 7 reports the panel data estimates of size effects controlling for 6 risk variables common both to developed and emerging markets and 3 factors particular to emerging markets: the intensity of capital controls, Q , an interaction term between size and the segmentation variable and a measure of country specific composite risk. For the developed markets we note that size effects have the correct sign but they are not statistically significant. For the emerging markets, size effects remain large and significant both statistically and economically in the presence of various risk variables. Moreover, size effects become stronger the with intensity of capital controls. For instance, we find that the coefficients of size effects of the investable indices (column 3 of Table 7) are -2.31% for a country where there are no restrictions to foreign ownership (corresponding to a decrease of 5 basis points per month in expected returns due to an average monthly increase in the size measure of 0.023) and almost double, -4.23% (around 10 basis points decrease in the monthly respected returns) if foreign investors are not allowed to own domestic assets (i.e. $Q = 1$). Allowing for country specific World Market betas (Table 8) does not change the

estimates of size effects which remain important after controlling for the intensity of capital controls.

So far we have assumed constant (aggregate or country specific) World Market betas. However, there is strong evidence that global (regional) market betas tend to increase with integration (see Bekaert and Harvey (2000), Fratzscher (2002), Baele (2005) for instance). We allow for the world market betas to vary as a linear function of segmentation (as in De Jong and De Roon (2005)) and as a function of both segmentation and size. We re-estimate the following equations for emerging markets:

$$r_{d_{it}} - r_{f_t} = \alpha_i + (\beta_0 + \beta_1 * Q_{it}) (r_{w_t} - r_{f_t}) + \gamma Size_{it} + \delta Q_{it} + \phi Q_{it} * Size_{it} + \theta X_t + \varepsilon_{it}, \quad (5)$$

$$r_{d_{it}} - r_{f_t} = \alpha_i + (\beta_0 + \beta_1 * Q_{it} + \beta_2 * Size_{it}) (r_{w_t} - r_{f_t}) + \gamma Size_{it} + \delta Q_{it} + \phi Q_{it} * Size_{it} + \theta X_t + \varepsilon_{it} \quad (6)$$

The results are presented in Tables 9 and 10. Size and segmentation effects are virtually unchanged. Assuming an expected return on the world market of 0.50 (the sample average) and the average segmentation measure, $Q = 0.32$, the size effect on expected (global) returns is equal to 24 basis points per month, or about 3% annually.

Overall, our results show that the two key variables for the emerging markets, the size and the intensity of capital controls are reinforcing each other and their large effects on expected returns suggests strong links between time-varying market integration and market development.

6 Concluding Remarks

We show that market size can be relevantly linked to market integration of emerging markets, over and above more direct measures of segmentation that drive expected returns, as the intensity of capital controls. We test for market size effects using country indices for a groups of developed countries (members of OECD) and emerging markets and we find that they are important predominantly for emerging markets rather than developed markets. The results for emerging markets hold both within individual countries and for the entire group and are present in the full sample as well as for subperiods. The presence and significance of size effects is robust to controls related to global economic risks as well as specific emerging markets country risk.

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Table 1: Summary Statistics - Intensity of Capital Controls and Market Capitalization

This table reports summary statistics for the intensity of capital controls and global market capitalization (in millions USD) on regional and country level. The monthly values of the intensity of capital controls are computed from market capitalization data available for the investable and global markets. The data coverage for the intensity of capital controls varies by countries and group of countries. The longest time series covers the period December 1988 to February 2005 (195 observations) and the shortest starts in February 1997 and ends in October 2001 (57 observations).

Country	CAPITAL CONTROLS				MARKET CAP (mill USD)				CORR
	Mean	Min.	Max.	#	Mean	Min.	Max.	#	
Composite	0.45	0.22	0.88	195	722193	30333	1955700	243	-0.83
Asia	0.58	0.19	0.92	195	413282	18252	1040600	243	-0.79
EMEA	0.22	0.02	0.39	111	289672	155660	623400	111	0.43
Europe	0.17	0.03	0.45	111	124024	37656	227570	111	0.02
E. Europe	0.28	0.11	0.82	111	68996	2782	199280	111	0.12
Latin America	0.23	0.03	0.82	195	160366	8101	367980	243	-0.67
Mid East Africa	0.25	0.44	0.03	111	165648	93877	395840	111	0.64
Argentina	0.06	0.00	0.28	195	8734	83	35860	351	-0.70
Brazil	0.28	0.03	0.88	195	40884	2012	150670	351	-0.60
Chile	0.38	0.00	0.85	195	16788	154	56895	351	-0.42
China	0.76	0.41	0.96	147	78124	11949	187000	147	-0.93
Colombia	0.24	0.04	0.59	129	4554	285	13488	243	-0.61
Czech Republic	0.31	0.00	0.71	135	6225	2079	16002	135	0.67
Egypt	0.23	0.05	0.40	97	5142	1220	14443	111	-0.57
Greece	0.09	0.00	0.38	149	10480	245	92542	305	-0.56
Hungary	0.13	0.00	0.54	147	6832	390	24172	147	-0.79
India	0.67	0.33	0.79	147	30295	527	126270	351	-0.38
Indonesia	0.31	0.00	0.74	174	17282	2254	58262	183	0.17
Israel	0.01	0.00	0.06	99	26141	12609	48360	99	0.02
Jordan	0.63	0.46	0.73	155	2361	487	7877	315	-0.06
Korea	0.43	0.02	0.92	158	61608	324	296770	351	-0.49
Malaysia	0.14	0.03	0.35	195	57078	6811	183290	243	0.04
Mexico	0.13	0.00	0.89	195	40179	608	154140	351	-0.54
Morocco	0.17	0.04	0.36	97	6053	2995	10425	111	-0.32
Pakistan	0.37	0.11	0.84	127	3276	495	9389	243	0.00
Peru	0.12	0.02	0.27	147	5856	1462	10483	147	-0.55
Philippines	0.51	0.39	0.65	195	14236	200	53235	243	-0.14
Poland	0.01	0.00	0.04	147	7649	188	26898	147	0.40
Portugal	0.26	0.03	0.47	124	10294	138	39018	159	-0.51
Russia	0.32	0.21	0.44	97	46452	4192	140240	111	0.80
Slovakia	0.12	0.04	0.22	57	605	143	1585	106	0.75
South Africa	0.00	0.00	0.04	147	93986	46895	162460	147	0.17
Sri Lanka	0.64	0.34	0.76	107	1049	392	2333	147	-0.32
Taiwan	0.66	0.11	0.96	170	121309	2566	275720	243	-0.80
Thailand	0.58	0.34	0.78	195	19486	207	104390	351	0.34
Turkey	0.02	0.00	0.67	187	16846	377	64568	219	-0.26
Venezuela	0.29	0.00	0.67	142	3356	516	10714	243	0.03
Zimbabwe	0.74	0.58	0.88	101	937	33	10649	351	-0.09

Table 2: Market Size Effects - Time Series Regressions - Emerging Markets

This table reports the sign and significance on the existence of country size effects based on the regression of domestic (monthly) excess returns on the (excess) returns on the World Market Index and ‘size’ factor:

$$r_d - r_f = \alpha + \beta(r_w - r_f) + \gamma f(size) + \varepsilon, \quad (7)$$

where α and ε are respectively the intercept and the disturbance term. The size effects are represented by the coefficient $\hat{\gamma}$. $f(size)$ is a function (logarithm) of the country’s market capitalization. Significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Investables		Non-Investables		Global	
Sign (-)	Sign(+)	Sign (-)	Sign(+)	Sign (-)	Sign(+)
COMP*	EMEA	COMP	EMEA	COMP	EMEA
LATA***	MEAF***	LATA	EEUR	LATA	MEAF***
ASIA*		ASIA	MEAF**	ASIA	
EURO***		EURO		EURO***	
EEUR				EEUR	
ARGE**	CHIN	ARGE	GREE**	ARGE**	GREE
BRAZ**	PORT	BRAZ	HUNG	BAHR	HUNG
CHIL***		CHIL**	POLA	BRAZ	JORD
COLO**		CHIN	PORT	CHIL	SAUD***
CZEC***		COLO		CHIN	
EGYP		CZEC		COLO	
GREE		EGYP		CZEC**	
HUNG		INDI		EGYP	
INDI		INDO		INDI	
INDO**		ISRA		INDO**	
ISRA		JORD**		ISRA	
JORD		KORE		KORE	
KORE		MALA**		MALA	
MALA**		MEXI**		MEXI	
MEXI***		MORO***		MORO***	
MORO*		PAKI***		PAKI	
PAKI***		PERU***		PERU**	
PERU*		PHIL**		PHIL***	
PHIL**		RUSS		POLA*	
POLA		SLVK***		PORT***	
RUSS		SOAF		RUSS**	
SLVK**		SRIL*		SLVK**	
SOAF		TAIW*		SOAF	
SRIL*		THAI***		SRIL***	
TAIW		TURK		TAIW*	
THAI***		VENE***		THAI	
TURK		ZIMB		TURK	
VENE***				VENE*	
ZIMB				ZIMB	

Table 3: Market Size Effects - Time Series Regressions - Developed Markets

This table reports the sign and significance on the existence of country size effects based on the regression of domestic (monthly) excess returns on the (excess) returns on the World Market Index and ‘size’ factor:

$$r_d - r_f = \alpha + \beta(r_w - r_f) + \gamma f(size) + \varepsilon, \quad (8)$$

where α and ε are respectively the intercept and the disturbance term. The size effects are represented by the coefficient $\hat{\gamma}$. $f(size)$ is a function of the country’s market capitalization: logarithm and respectively the rank in the sample of all countries. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Data	DATASTREAM			
Period	1973-2006			
f(size)	Logarithm		Sample Rank	
	Sign (-)	Sign(+)	Sign (-)	Sign(+)
AUSTRALIA	AUSTRALIA	AUSTRIA	CZECH REP.	AUSTRALIA
CZECH REP.	CZECH REP.	BELGIUM	FRANCE	AUSTRIA
FRANCE	FRANCE	CANADA	GREECE	BELGIUM
GERMANY	GERMANY	DENMARK	HUNGARY	CANADA
HUNGARY	HUNGARY	FINLAND	IRELAND	DENMARK
ITALY	ITALY	GREECE	ITALY	FINLAND
JAPAN	JAPAN	IRELAND	JAPAN*	GERMANY
KOREA	KOREA	NETHERLAND	LUXEMBOURG*	KOREA
LUXEMBURG	LUXEMBURG	NORWAY	MEXICO	NORWAY
MEXICO***	MEXICO***	POLAND	NETHERLAND	POLAND
NEW ZEALAND	NEW ZEALAND	PORTUGAL	NEW ZEALAND	PORTUGAL
SWEDEN	SWEDEN	SLOVAKIA	SWEDEN	SLOVAKIA
TURKEY	TURKEY	SPAIN	TURKEY**	SPAIN
UK	UK	SWITZERLAND	UK	SWITZERLAND
US	US		US	

Table 4: Market Size Effects - Panel Data Regressions - Developed and Emerging Markets

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index and a 'size' factor:

$$r_{d_{it}} - r_{f_t} = \alpha_i + \beta(r_{wt} - r_{f_t}) + \gamma f(size_{it}) + \varepsilon_{it}, \quad (9)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. The size effects are represented by the coefficient $\hat{\gamma}$. $f(size)$ is a function of the country's market capitalization: logarithm and respectively the rank in the sample of all countries. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Dep. Var.	Return Indices			Investables			Non-Investables			Global Indices		
	DATASTREAM	OECD	EMDB	Emerging Mkts	EMDB	Emerging Mkts	EMDB	Emerging Mkts	EMDB	Emerging Mkts	EMDB	Emerging Mkts
Group	1973-2006	1973-2006	1989-2005	1989-2005	1989-2005	1989-2005	1989-2005	1989-2005	1975-2005	1975-2005	1975-2005	1975-2005
f(size)	Log	Rank	Log	Rank	Log	Rank	Log	Rank	Log	Rank	Log	Rank
No. cr.sect.	29	29	31	31	31	31	31	31	35	35	35	35
No. obs.	8747	8747	4312	4312	4312	4312	4312	4312	7445	7445	7445	7445
Intercept	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-				
(T-stat)	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-	-n.r.-
World Mkt	0.69***	0.77***	0.87***	0.86***	0.66***	0.65***	0.60***	0.61***				
(T-stat)	(34.42)	(28.13)	(16.17)	(15.58)	(11.50)	(11.23)	(14.23)	(14.36)				
Size	-0.05	-2.66	-3.01***	-11.88***	-2.17***	-10.53***	-0.77***	-0.74***				
(T-stat)	(-0.91)	(-1.07)	(-7.04)	(-5.55)	(-4.45)	(-4.44)	(-5.11)	(-5.08)				
R-sq	0.20	0.20	0.11	0.09	0.05	0.04	0.05	0.04				

Table 5: Market Size Effects - Panel Data Regressions - Developed Markets, 5-year subperiods

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index and a 'size' factor:

$$r_{d_{it}} - r_{f_t} = \alpha_i + \beta(r_{wt} - r_{f_t}) + \gamma f(\text{size}_{it}) + \varepsilon_{it}, \quad (10)$$

where α_i and ε_{it} are respectively the fixed effects and the disturbance term. The size effects are represented by the coefficient $\hat{\gamma}$. $f(\text{size})$ is a function of the country's market capitalization: logarithm and respectively the rank in the sample of all countries. The sample is reduced to 5-year subperiods. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Group	OECD											
Period	1975-1980		1980-1985		1985-1990		1990-1995		1995-2000		2000-2005	
f(size)	Log	Rank	Log	Rank	Log	Rank	Log	Rank	Log	Rank	Log	Rank
No. cr.sect.	14	14	16	16	22	22	28	28	29	29	29	29
No. obs.	840	840	952	952	1084	1084	1543	1543	1734	1734	1740	1740
World Mkt	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-
(T-stat)	0.39***	0.39***	0.53***	0.53***	0.63***	0.64***	0.73***	0.73***	0.78***	0.78***	0.79***	0.81***
Size	(9.79)	(10.03)	(12.65)	(12.81)	(10.99)	(10.66)	(12.22)	(12.36)	(16.55)	(16.75)	(21.66)	(21.70)
(T-stat)	-1.50	-4.21**	-0.78	3.07	-0.54	-2.65	-0.41	-23.45***	0.21	3.23	-2.00***	-6.40*
(T-stat)	(-1.56)	(-2.18)	(-1.12)	(1.32)	(-0.57)	(-1.20)	(-0.69)	(-3.82)	(0.48)	(0.58)	(-2.89)	(-1.90)
R-sq	0.13	0.13	0.19	0.19	0.21	0.21	0.10	0.11	0.19	0.19	0.38	0.37

Table 6: Market Size Effects - Panel Data Regressions - Emerging Markets, 5-year subperiods

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index and two size-related factors:

$$r_{dit} - r_{ft} = \alpha_i + \beta(r_{wt} - r_{ft}) + \gamma f(size_{it}) + \delta f(size_{it}) * Q_{it} + \varepsilon_{it}, \quad (11)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. The size effects are represented by the coefficient $\hat{\gamma} + \hat{\delta}Q$. $f(size)$ is a function of the country's market capitalization: logarithm and respectively the rank in the sample of all countries and Q is the intensity of capital controls. The sample is reduced to 5-year subperiods. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

f(size)	Investables		Non-Investables		Global Indices	
	Log	Rank	Log	Rank	Log	Rank
Period	1990-1995	1990-1995	1990-1995	1990-1995	1990-1995	1990-1995
No. cr.sect.	25	25	25	25	26	26
No. obs.	1118	1118	1118	1118	1157	1157
	-1-	-2-	-3-	-4-	-5-	-6-
World Mkt	0.60***	0.59***	0.52***	0.51***	0.62***	0.61***
(T-stat)	(5.60)	(5.40)	(5.07)	(4.88)	(6.32)	(6.05)
Size	-4.17***	-17.14***	-2.80***	-9.39	-4.38***	-15.05***
(T-stat)	(-5.20)	(-3.02)	(-3.20)	(-1.53)	(-5.20)	(-2.67)
Size*Q	0.56	7.66	-0.54	-3.18	-0.23	5.22
(T-stat)	(0.81)	(0.69)	(-0.72)	(-0.26)	(-0.32)	(0.46)
R-sq	0.06	0.04	0.03	0.03	0.07	0.04
Period	1995-2000	1995-2000	1995-2000	1995-2000	1995-2000	1995-2000
No. cr.sect.	31	31	31	31	31	31
No. obs.	1615	1615	1615	1615	1727	1727
World Mkt	1.09***	1.10***	0.83***	0.83***	1.03***	1.04***
(T-stat)	(11.11)	(11.09)	(7.64)	(7.62)	(10.79)	(10.78)
Size	-3.27***	-7.50*	-1.43***	0.33	-3.33***	-7.51*
(T-stat)	(-4.43)	(-1.84)	(-1.34)	(0.05)	(-4.68)	(-1.96)
Size*Q	-0.48**	-14.74**	-0.62**	-23.33***	-0.48*	-15.23**
(T-stat)	(-1.97)	(-2.41)	(-1.98)	(-3.10)	(-1.93)	(-2.46)
R-sq	0.15	0.14	0.07	0.07	0.14	0.13
Period	2000-2005	2000-2005	2000-2005	2000-2005	2000-2005	2000-2005
No. cr.sect.	29	29	29	29	30	30
No. obs.	1423	1423	1423	1423	1489	1489
World Mkt	0.96***	0.96***	0.75***	0.74***	0.90***	0.89***
(T-stat)	(15.26)	(14.83)	(9.38)	(9.29)	(14.99)	(14.63)
Size	-5.19***	-12.38***	-4.37***	-8.93***	-4.80***	-12.44***
(T-stat)	(-6.49)	(-3.60)	(-3.57)	(-1.85)	(-6.38)	(-3.63)
Size*Q	-0.08	-14.42	-1.59***	-26.89***	-0.31	-16.43*
(T-stat)	(-0.24)	(-1.60)	(-3.17)	(-2.61)	(-0.90)	(-1.89)
R-sq	0.20	0.20	0.09	0.09	0.22	0.19

Table 7: **Size and Segmentation Effects, controlling for Global Risk Factors**

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index and size effects:

$$r_{d_{it}} - r_{f_t} = \alpha_i + \beta(r_{w_t} - r_{f_t}) + \gamma f(size_{it}) + \delta X_t + \varepsilon_{it}, \quad (12)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. $f(size)$ is a function of the country's market capitalization: logarithm and respectively the rank in the sample of all countries, and X_t is a set of global risk variables common both to developed and emerging markets: FX , a price-adjusted index of the foreign exchange value of the dollar against a broad basket of currencies, $G7INFL$, the monthly change in the CPI of the G7 countries (Canada, France, Germany, Italy, Japan, UK and US), $G7IR$, a weighted average of short term interests rates in G7 countries (with weights given by their shares in the G7 GDP), $CRRISK$, the difference between the 3-month Eurodollar rate and the 3-month US Treasury Bill yield, $G7PROD$ is the change in the monthly PPI for the manufacturing sector and $OIL\&GAS$, the change in the monthly World Price Index for Oil and Gas. For emerging markets the set of variables is extended to include Q , the intensity of capital controls, a interaction term between $f(size)$ and Q and a measure of $COMPOSITE$ (economic, political and financial) risk. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Dep. Var.	Return Indices		Investables		Non-Investables		Global Indices	
Group	OECD		Emerging Markets		Emerging Markets		Emerging Markets	
Period	1973-2006		1989-2005		1989-2005		1989-2005	
f(size)	Log	Rank	Log	Rank	Log	Rank	Log	Rank
No. cr.sect.	29	29	30	30	30	30	30	30
No. obs.	7186	7186	4142	4142	4142	4142	4407	4407
	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
World Mkt	0.65***	0.66***	0.69***	0.69***	0.49***	0.49***	0.66***	0.66***
(T-stat)	(24.13)	(24.57)	(10.13)	(9.92)	(6.35)	(6.23)	(10.24)	(10.05)
Size	-0.61***	-1.51	-2.31***	-4.03*	-1.48**	-5.10*	-2.66***	-6.02***
(T-stat)	(-2.92)	(-1.10)	(-4.21)	(-1.71)	(-2.05)	(-1.76)	(-4.58)	(-2.61)
Q			20.51**	4.88***	18.35*	3.03*	10.77	3.09*
(T-stat)			(2.30)	(3.23)	(1.80)	(1.69)	(1.17)	(2.11)
Size*Q			-1.92**	-16.40***	-1.79*	-14.44***	-1.06	-13.53***
(T-stat)			(-2.21)	(-3.31)	(-1.83)	(-2.57)	(-1.19)	(-2.75)
COMPOSITE			-0.08*	-0.21***	-0.11*	-0.18***	-0.08*	-0.21***
(T-stat)			(-1.73)	(-4.21)	(-1.83)	(-3.40)	(-1.78)	(-4.39)
FX	0.35***	0.31***	-0.68***	-0.76***	-0.70***	-0.75***	-0.63***	-0.72***
(T-stat)	(5.37)	(4.80)	(-3.29)	(-3.64)	(-3.27)	(-3.46)	(-3.26)	(-3.68)
G7 INFL	-1.15**	-0.95**	1.80	2.42*	1.16	1.49	2.22*	2.84**
(T-stat)	(-2.52)	(-2.06)	(1.30)	(1.70)	(0.80)	(1.01)	(2.72)	(2.16)
G7 IR	-0.25***	0.02	-0.53***	-0.51***	-0.57***	-0.57***	-0.54***	-0.49***
(T-stat)	(-3.24)	(0.57)	(-3.65)	(-3.58)	(-3.46)	(-3.43)	(-3.77)	(-3.52)
CR RISK	-0.01***	-0.01***	0.00	0.00	-0.00	-0.00	0.00	0.00
(T-stat)	(3.63)	(4.01)	(0.01)	(0.11)	(-0.80)	(-0.75)	(0.57)	(-0.61)
G7 PROD	-0.12	-0.14	-1.59*	-1.82**	-1.97**	-2.02**	-1.66**	-1.86**
(T-stat)	(-0.42)	(-0.48)	(-1.93)	(-2.17)	(-2.41)	(-2.43)	(-2.20)	(-2.42)
OIL&GAS	0.16***	0.15***	0.19***	0.19***	0.16**	0.16**	0.18***	0.17***
(T-stat)	(7.18)	(7.09)	(3.33)	(3.31)	(2.50)	(2.54)	(3.38)	(3.33)
R-sq	0.22	0.22	0.12	0.11	0.06	0.06	0.12	0.11

Table 8: Size and Segmentation Effects, with country specific World Market Betas and Global Risk Factors

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index and size effects:

$$r_{d_{it}} - r_{f_t} = \alpha_i + \beta_i (r_{w_t} - r_{f_t}) + \gamma f(size_{it}) + \delta X_t + \varepsilon_{it}, \quad (13)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. $f(size)$ is a function of the country's market capitalization: logarithm and respectively the rank in the sample of all countries, and X_t is a set of global risk variables common both to developed and emerging markets: FX , a price-adjusted index of the foreign exchange value of the dollar against a broad basket of currencies, $G7INFL$, the monthly change in the CPI of the G7 countries (Canada, France, Germany, Italy, Japan, UK and US), $G7IR$, a weighted average of short term interests rates in G7 countries (with weights given by their shares in the G7 GDP), $CRRISK$, the difference between the 3-month Eurodollar rate and the 3-month US Treasury Bill yield, $G7PROD$ is the change in the monthly PPI for the manufacturing sector and $OIL\&GAS$, the change in the monthly World Price Index for Oil and Gas. For emerging markets the set of variables is extended to include Q , the intensity of capital controls, a interaction term between $f(size)$ and Q and a measure of $COMPOSITE$ (economic, political and financial) risk. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Dep. Var.	Return Indices		Investables		Non-Investables		Global Indices	
Group	OECD		Emerging Mkts		Emerging Mkts		Emerging Mkts	
Period	1973-2006		1989-2005		1989-2005		1989-2005	
f(size)	Log	Rank	Log	Rank	Log	Rank	Log	Rank
No. cr.sect.	29	29	30	30	30	30	30	30
No. obs.	7186	7186	4142	4142	4142	4142	4360	4360
	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Size	-0.58***	-1.70	-2.17***	-3.89*	-1.34*	-4.91*	-2.54***	-5.95***
(T-stat)	(-2.80)	(-1.22)	(-4.08)	(-1.72)	(-1.93)	(-1.77)	(-4.57)	(-2.68)
Q			21.86**	4.74***	20.28**	3.02*	12.47	3.12*
(T-stat)			(2.55)	(3.19)	(2.09)	(1.72)	(1.42)	(2.18)
Size*Q			-2.08**	-17.65***	-2.00**	-16.53***	-1.25	-15.46***
(T-stat)			(-2.49)	(-3.58)	(-2.14)	(-2.99)	(-1.46)	(-3.20)
COMPOSITE			-0.08*	-0.20***	-0.11*	-0.18***	-0.08*	-0.20***
(T-stat)			(-1.68)	(-4.18)	(-1.88)	(-3.40)	(-1.76)	(-4.37)
FX	0.35***	0.31***	-0.69***	-0.76***	-0.70***	-0.75***	-0.63***	-0.72***
(T-stat)	(5.39)	(4.85)	(-3.37)	(-3.70)	(-3.34)	(-3.53)	(-3.33)	(-3.75)
G7 INFL	-1.14**	-0.95**	1.80	2.37*	1.23	1.51	2.21*	2.77**
(T-stat)	(-2.50)	(-2.05)	(1.34)	(1.74)	(0.87)	(1.05)	(1.77)	(2.18)
G7 IR	-0.24***	-0.02	-0.54***	-0.48***	-0.54***	-0.54***	-0.52***	-0.48***
(T-stat)	(-3.12)	(-0.57)	(-3.41)	(-3.35)	(-3.25)	(-3.25)	(-3.61)	(-3.39)
CR RISK	-0.01***	-0.01***	0.00	0.00	-0.00	-0.00	0.00	0.00
(T-stat)	(-3.80)	(-4.16)	(0.02)	(0.12)	(-0.73)	(-0.67)	(0.56)	(-0.60)
G7 PROD	-0.10	-0.12	-1.44*	-1.64**	-1.83**	-1.84**	-1.54**	-1.71**
(T-stat)	(-0.45)	(-0.42)	(-1.75)	(-1.97)	(-2.25)	(-2.23)	(-2.06)	(-2.26)
OIL&GAS	0.15***	0.15***	0.19***	0.19***	0.16**	0.17***	0.18***	0.17***
(T-stat)	(7.12)	(7.23)	(3.37)	(3.36)	(2.59)	(2.64)	(3.35)	(3.33)
R-sq	0.23	0.23	0.14	0.13	0.08	0.08	0.14	0.13

Table 9: **Size and Segmentation Effects, with country specific and time-varying World Market Betas and Global Risk Factors**

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index allowing for additional factors:

$$r_{d_{it}} - r_{f_t} = \alpha_i + (\beta_0 + \beta_1 * Q_{it}) (r_{w_t} - r_{f_t}) + \gamma Size_{it} + \delta Q + \phi Q * Size_{it} + \theta X_t + \varepsilon_{it}, \quad (14)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. *Size* is the rank function based on the market capitalization. The additional factors include *Q*, the intensity of capital controls, a interaction term between *Size* and *Q* and a measure of *COMPOSITE* (economic, political and financial) risk as well as a set of global risk variables, X_t : *FX*, a price-adjusted index of the foreign exchange value of the dollar against a broad basket of currencies, *G7INFL*, the monthly change in the CPI of the G7 countries (Canada, France, Germany, Italy, Japan, UK and US), *G7IR*, a weighted average of short term interests rates in G7 countries (with weights given by their shares in the G7 GDP), *CRRISK*, the difference between the 3-month Eurodollar rate and the 3-month US Treasury Bill yield, *G7PROD* is the change in the monthly PPI for the manufacturing sector and *OIL&GAS*, the change in the monthly World Price Index for Oil and Gas. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Dep. Var.	Investables	Non-Investables	Global Indices
Group	Emerging Mkts	Emerging Mkts	Emerging Mkts
Period	1989-2005	1989-2005	1989-2005
No. cr. sect.	30	30	30
No. obs.	4142	4142	4360
	-1-	-2-	-3-
Intercept	-n.r.-	-n.r.-	-n.r.-
(T-stat)	-n.r.-	-n.r.-	-n.r.-
World Mkt	0.88***	0.61***	0.89***
(T-stat)	(9.43)	(5.47)	(10.31)
World Mkt*Q	-0.61***	-0.39***	-0.77***
(T-stat)	(-3.42)	(-1.99)	(-4.67)
Size	-4.22**	-5.23*	-6.21***
(T-stat)	(-2.01)	(-1.80)	(-2.72)
Q	5.12***	3.18*	3.45**
(T-stat)	(3.39)	(1.77)	(2.36)
Size*Q	-16.59***	-14.56***	-13.86***
(T-stat)	(-3.37)	(-2.61)	(-2.86)
COMPOSITE	-0.20***	-0.18***	-0.20***
(T-stat)	(-4.09)	(-3.33)	(-4.26)
FX	-0.76***	-0.75***	-0.72***
(T-stat)	(-3.64)	(-3.46)	(-3.68)
G7 INFL	2.15	1.33	2.49*
(T-stat)	(1.52)	(0.89)	(1.88)
G7 IR	-0.49***	-0.55***	-0.47***
(T-stat)	(-3.47)	(-3.37)	(-3.41)
CR RISK	0.00	-0.00	0.00
(T-stat)	(0.22)	(-0.70)	(0.71)
G7 PROD	-1.63*	-1.90**	-1.65**
(T-stat)	(-1.93)	(-2.27)	(-2.13)
OIL&GAS	0.19***	0.16***	0.18***
(T-stat)	(3.39)	(2.58)	(3.42)
R-sq	0.12	0.06	0.12

Table 10: **Size and Segmentation Effects, with time-varying World Market Betas and Global Risk Factors**

This table reports the results of fixed effects panel regressions of domestic (monthly) excess returns on the (excess) returns on the World Market Index allowing for additional factors:

$$r_{d_{it}} - r_{f_t} = \alpha_i + (\beta_0 + \beta_1 * Q_{it} + \beta_2 * Size_{it}) (r_{w_t} - r_{f_t}) + \gamma Size_{it} + \delta Q + \phi Q * Size_{it} + \theta X_t + \varepsilon_{it}, \quad (15)$$

where α_i and ε_t are respectively the fixed effects and the disturbance term. *Size* is the rank function based on the market capitalization. The additional factors include *Q*, the intensity of capital controls, a interaction term between *Size* and *Q* and a measure of *COMPOSITE* (economic, political and financial) risk as well as a set of global risk variables, X_t : *FX*, a price-adjusted index of the foreign exchange value of the dollar against a broad basket of currencies, *G7INFL*, the monthly change in the CPI of the G7 countries (Canada, France, Germany, Italy, Japan, UK and US), *G7IR*, a weighted average of short term interests rates in G7 countries (with weights given by their shares in the G7 GDP), *CRRISK*, the difference between the 3-month Eurodollar rate and the 3-month US Treasury Bill yield, *G7PROD* is the change in the monthly PPI for the manufacturing sector and *OIL&GAS*, the change in the monthly World Price Index for Oil and Gas. Statistical inference is based on Newey-West standard errors and significance is denoted by *** (at 1%), ** (at 5%) and * (at 10%).

Dep. Var.	Investables	Non-Investables	Global Indices
Group	Emerging Mkts	Emerging Mkts	Emerging Mkts
Period	1989-2005	1989-2005	1989-2005
No. cr. sect.	30	30	30
No. obs.	4142	4142	4360
	-1-	-2-	-3-
Intercept	-n.r.-	-n.r.-	-n.r.-
(T-stat)	-n.r.-	-n.r.-	-n.r.-
World Mkt	0.75***	0.49***	0.79***
(T-stat)	(7.46)	(4.14)	(8.13)
World Mkt*Size	1.21***	1.16***	0.97***
(T-stat)	(4.54)	(3.92)	(3.95)
World Mkt*Q	-0.64***	-0.41***	-0.78***
(T-stat)	(-3.58)	(-2.10)	(-4.73)
Size	-4.65**	-5.64*	-6.57***
(T-stat)	(-2.01)	(-1.96)	(-2.93)
Q	5.05***	3.11*	3.39**
(T-stat)	(3.57)	(1.74)	(2.33)
Size*Q	-17.13***	-14.77***	-14.00***
(T-stat)	(-3.35)	(-2.64)	(-2.90)
COMPOSITE	-0.20***	-0.18***	-0.20***
(T-stat)	(-4.07)	(-3.32)	(-4.26)
FX	-0.75***	-0.74***	-0.71***
(T-stat)	(-3.58)	(-3.42)	(-3.65)
G7 INFL	1.88	1.06	2.28*
(T-stat)	(1.33)	(0.71)	(1.72)
G7 IR	-0.48***	-0.54***	-0.47***
(T-stat)	(-3.34)	(-3.28)	(-3.33)
CR RISK	0.00	-0.00	0.00
(T-stat)	(0.02)	(-0.84)	(0.57)
G7 PROD	-1.49*	-1.77**	-1.54**
(T-stat)	(-1.76)	(-2.10)	(-2.00)
OIL&GAS	0.18***	0.16**	0.17***
(T-stat)	(3.27)	(2.49)	(3.32)
R-sq	0.12	0.06	0.12

Figure 1: Intensity of Capital Controls

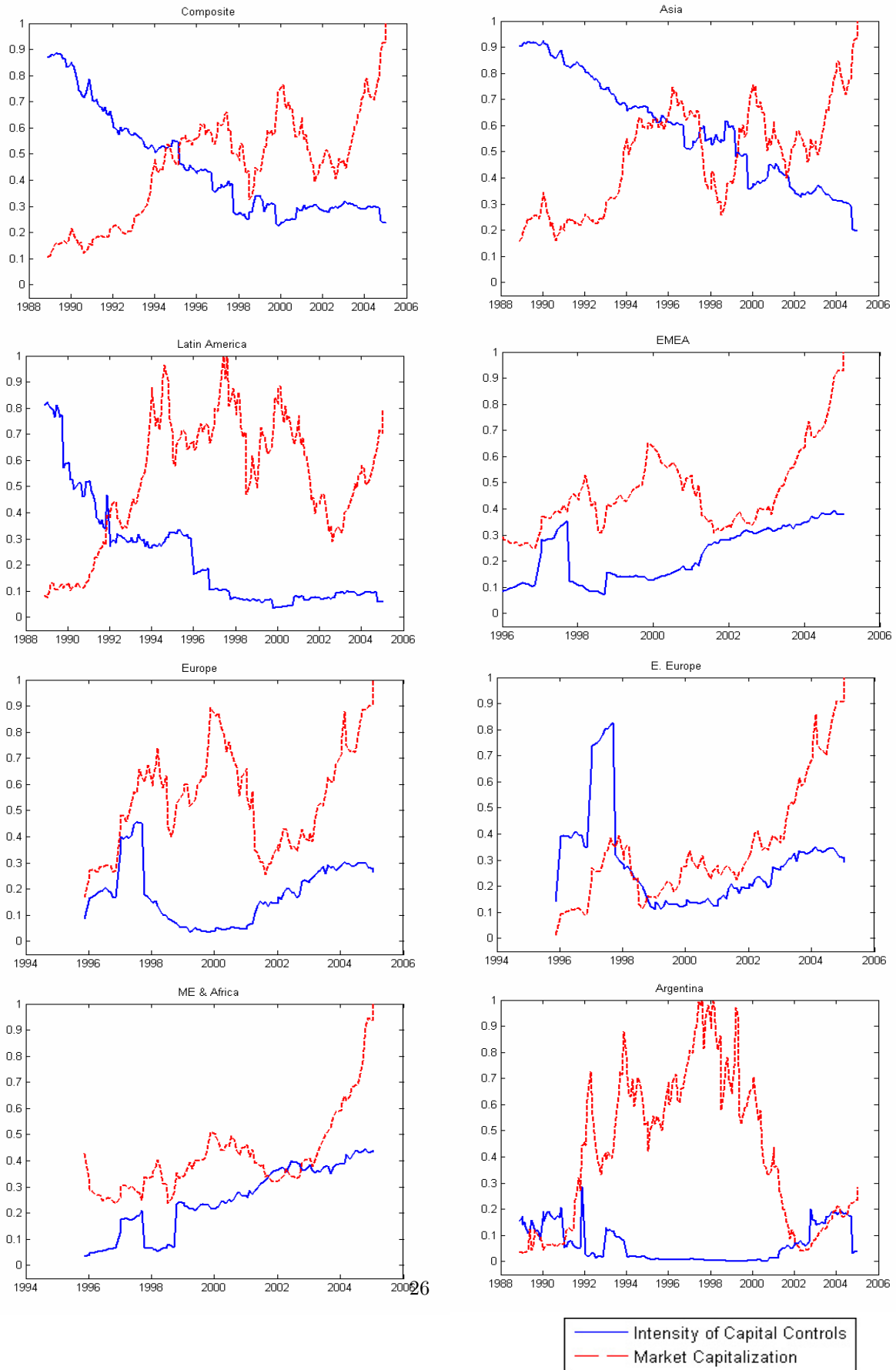


Figure 2: Intensity of Capital Controls

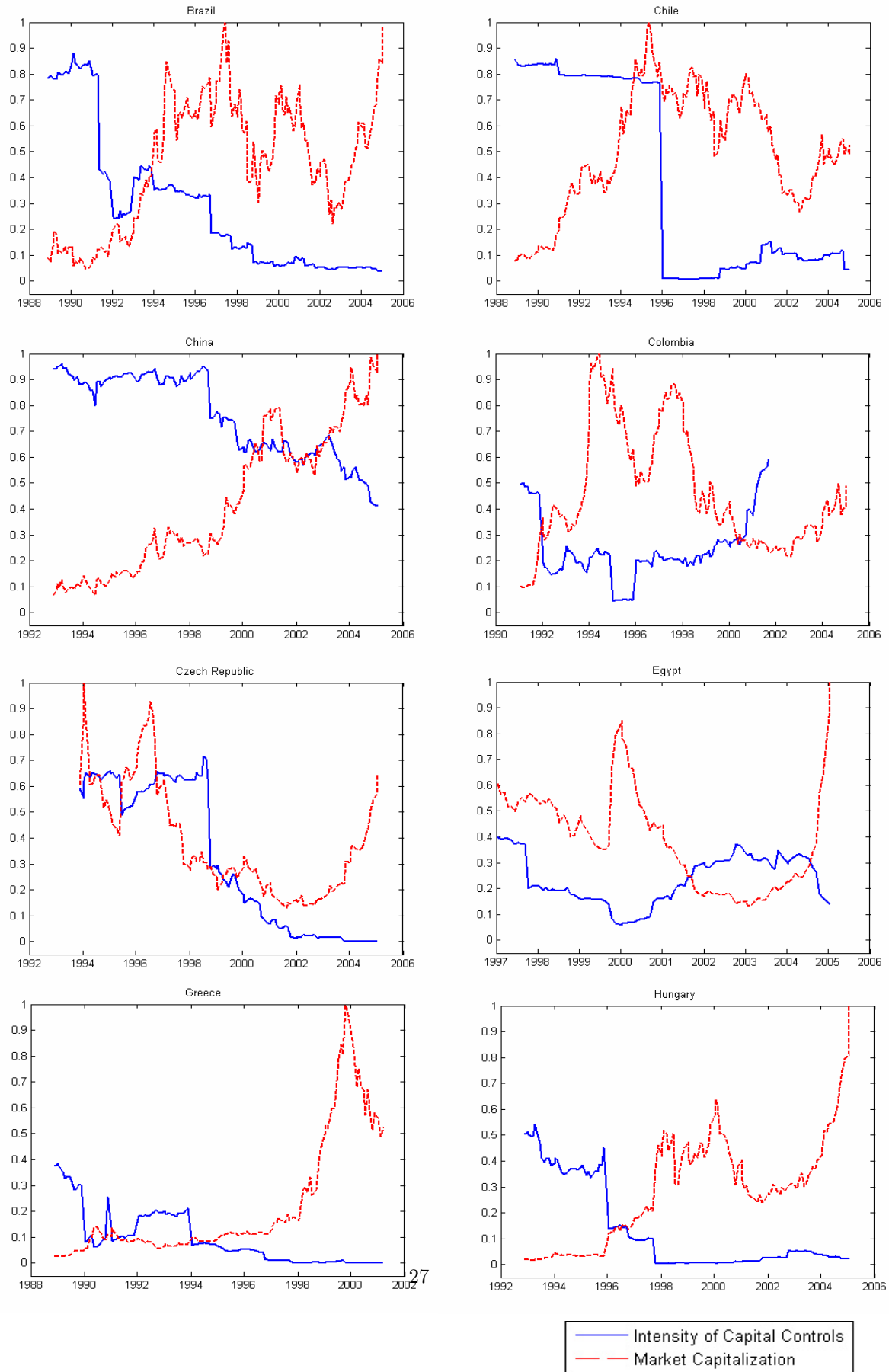


Figure 3: Intensity of Capital Controls

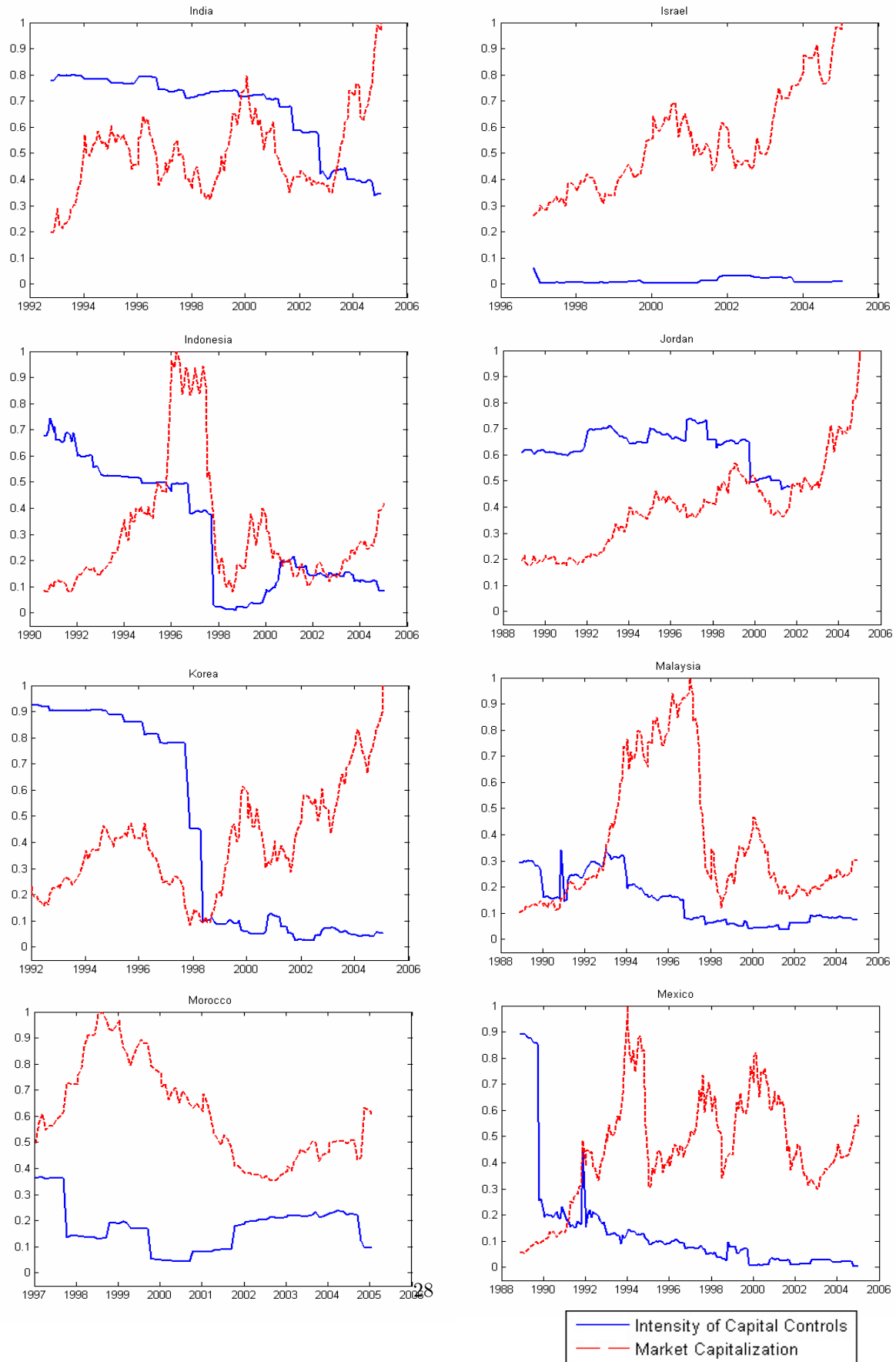


Figure 4: Intensity of Capital Controls

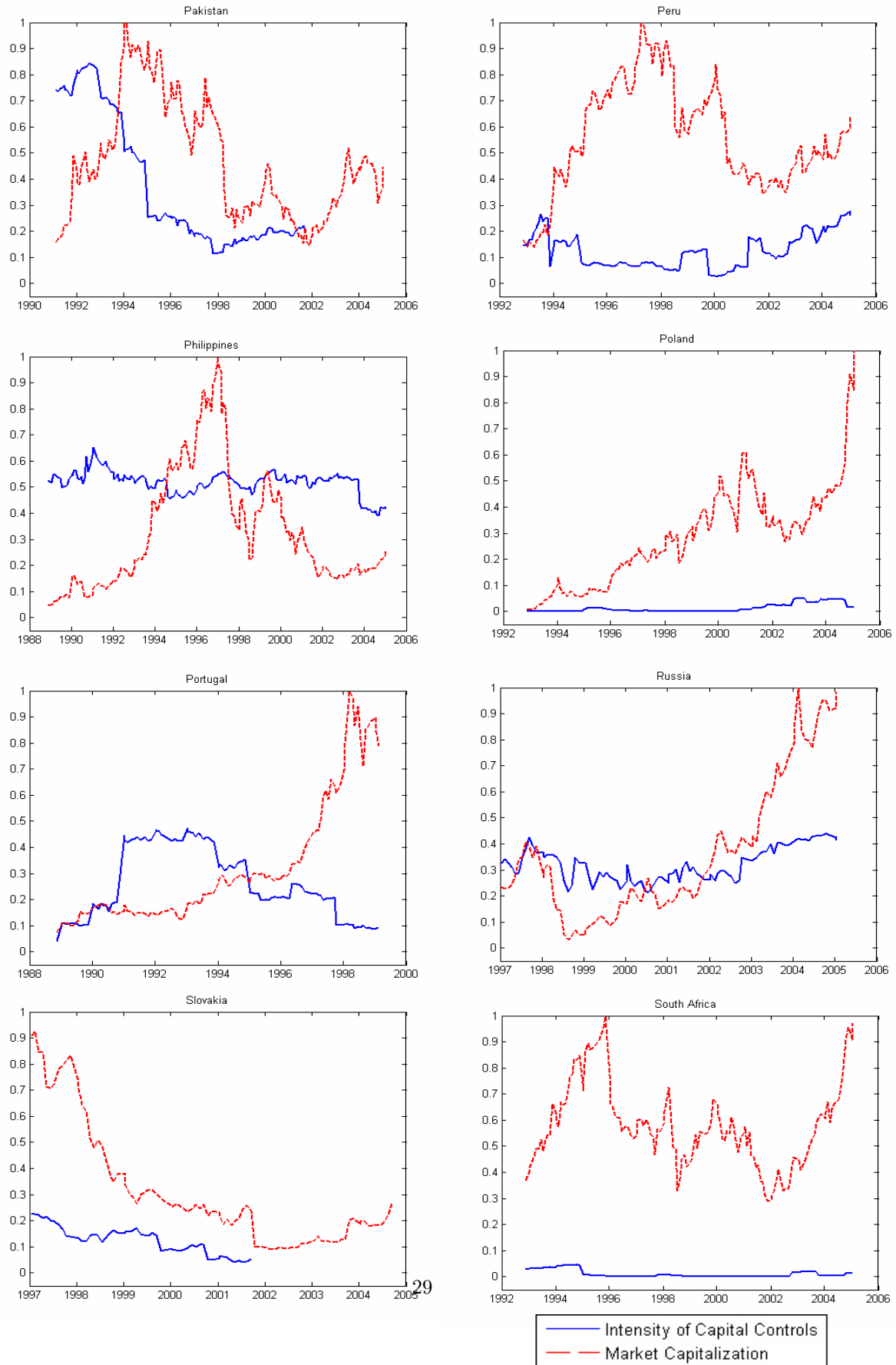


Figure 5: Intensity of Capital Controls

