

Size Matters: The Impact of Financial Liberalization on Individual Firms

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Abstract: We attempt to answer the following questions: What are the revaluation effects and the impact on performance, volatility, and return correlation from stock market liberalization in emerging markets? These questions have been studied extensively at the market-level but not at the firm level. Our results show significantly different impact of stock market liberalization across firms. Large firms tend to exhibit large revaluation effects, insignificant change in performance, large declines in volatility, and insignificant change in correlation from liberalization. Small firms show small revaluation effects, improved performance, smaller decline in volatility and decreases in correlation after liberalization. These results hold after controlling for movements in World stock returns, concurrent economic reforms and macroeconomic fundamentals. They are also robust to the length of the liberalization window. Our results have important implications for international investors seeking to manage their global exposure as well as for policy makers considering capital market liberalization.

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1. Introduction

Since the 1980s, we have witnessed a number of financial liberalizations in emerging markets (EMs). Such liberalizations are initiated by an official decree opening the market to foreign portfolio investments or the introductions of country funds and American Depositary receipts (ADRs) on developed markets. These are major policy initiatives with potentially significant impact on the domestic market and foreign investors. Although it is generally accepted that the resulting capital flows should internationalize the domestic capital markets with improved risk sharing a number of issues remain unresolved. Many recent studies have investigated the impact of market liberalizations – see for example, Bekaert and Harvey (2000), Henry (2000a), and Kim and Singal (2000).¹ These studies are very useful in assessing the average effect of liberalization on a country's securities and suggest that the cost of capital declines following liberalization. However, from a broad policy perspective, it is equally important to know whether the benefits accrue to the few large and well-known firms preferred by foreign investors² or they trickle down to the smaller firms that face the highest capital constraints. From the perspective of the foreign investor, it is also important to learn about the behavior of smaller firms that constitute future diversification opportunities.³

Thus, it is important to investigate the impact of stock market liberalization at a more disaggregated firm level. Using market-level results as benchmarks, we analyze firm-level data to investigate the impact of stock market liberalization with respect to revaluation effect, changes in performance, stock market volatility and correlation with World market return. Specifically, we assess the extent to which these effects are a function of firm size. We use panel regressions with weighted least squares (WLS) estimation and control for movements in World market, concurrent economic reforms and macroeconomic fundamentals as in Henry (2000a). We also check the robustness of our results to the choice of event window length.

An alternative approach used by Errunza and Miller (2000) focuses on cost of capital impact of the introduction of American Depositary Receipts (ADRs). In this case, the primary

¹ At the macroeconomic level, see Henry (2000b), Errunza (2001) and Bekaert, Harvey and Lundblad (2002) for the impact on growth following stock market liberalizations.

² For example, Kang and Stulz (1997), Choe, Kho and Stulz (1999) and Dahlquist, Pinkowitz, Stulz and Williamson (2003) show that foreign investors are more likely to invest in large firms.

³ The market-level International Finance Corporation (IFC) indices used in these studies may not represent the real portfolio holdings of investors and hence could under(over) estimate the impact depending on foreign demand for a security. The use of market-level indices to investigate the impact of market liberalization may also not take into account firm level asymmetries embedded in investment decisions since different firms from a liberalized market may provide different diversification opportunities to the foreign investor.

impact is on the firm that undertakes the program. They show that the decline in expected returns is driven by the diversification potential that the firm offers to foreign investors. Very recently, Chari and Henry (2004) investigate the stock price revaluation effect of liberalizations and show that the firm-specific revaluations are directly proportional to the firm-specific changes in systematic risk. Patro and Wald (2003) also study the impact of liberalization on return behavior of EM firms and relate it to firm characteristics.

Our main contributions are as follows: First, by investigating firm level data, we further our understanding of the economic benefits that accrue from liberalizations. Although the sample sizes at the individual country level are not sufficiently large to allow for sector level conclusions, the results can serve as a useful starting point for future investigations. Second, it allows us to investigate the cross-sectional differences among individual firms driven by foreign investors' demand using firm size as a proxy. The rationale for using firm size as a proxy is based on the importance of information availability. For example, in the IAPMs of Stulz (1981), and Errunza and Losq (1985), the informational barrier can render cross-border investments costly, or prohibit such investments in the limit. The "home bias" literature emphasizes the importance of information asymmetry to explain the predominance of home assets in international portfolios.⁴ In her survey of market experts and participants, Chuhan (1994) also reports limited information as one of the major impediments to investing in emerging markets. Firm size has also been used in many studies as a proxy for information richness and found to be a good indicator of information availability.⁵ Hence, it is reasonable to assume that foreign investors, who generally have limited information, prefer information-rich, large firms to information-poor, small firms in international investment decisions, especially in emerging markets.⁶

Third, we significantly enhance the power of the hypothesis tests by having more observations compared to studies that use market-level observations. Finally, since we deal with individual firms, we do not face the problem of including firms to test market liberalization impact

⁴ See for example, French and Poterba (1991), Cooper and Kaplanis (1994) and Lewis (1999).

⁵ See Bailey and Jagtiani (1994), Kang and Stulz (1997) and Bailey, Chung and Kang (1999) among others.

⁶ It is plausible that the cost of information on small-size firms is too high for foreign investors in relation to the potential diversification benefit. Hence, foreign investors may not invest in small firms. These small firms become non-traded in the vein of Stulz (1981) who shows that there could exist non-traded assets that do not provide sufficient benefits to overcome the cost of existing barriers. Along the same line, Merton (1987) also argues that investors invest only in securities they know about. He emphasizes the importance of information asymmetry in investment by noting that (p. 488) "*concern about asymmetric information among investors could be an important reason why some institutional and individual investors do not invest at all in certain securities, such as shares in relatively small firms with few stockholders.*" Note that this phenomenon will be much more severe in an international investment context.

even though they were not in IFC dataset before or during market liberalization. Our sample of firms does not change throughout the study period whereas the IFC index composition changes over time. This will contribute to some difference in results based on indices versus individual firms.

Our benchmark results using *market-level* data show statistically and economically significant revaluation effects and improved performance in the post liberalization period. However, neither the emerging stock market volatility nor its correlation with World market return changes after stock market liberalization. More importantly, at the firm level, large firms tend to exhibit large revaluation effects, insignificant change in performance, large declines in volatility, and insignificant change in correlation from liberalization. Small firms show small revaluation effects, improved performance, smaller decline in volatility and decreases in correlation after liberalization. These results hold after controlling for movements in World stock returns, concurrent economic reforms and macroeconomic fundamentals. They are also robust to the length of the liberalization window.

The remainder of the paper is organized as follows. In section 2, we briefly outline the implications of liberalization. We discuss stock market liberalization dates, IFCG indices and firm-level data in section 3. In section 4, we discuss methodological issues. Section 5 presents our empirical results. Conclusions follow.

2. The Impact of Financial Liberalization

We define financial liberalization as any action such as a government decree, introduction of CFs or ADRs that open domestic market to foreign portfolio investments.⁷ Assuming that foreign portfolio flows materialize, the degree of integration of the domestic market with the World market should rise over time. Of course, integration is a gradual, complex process and does not increase monotonically. For example, reversals in the degree of integration have been reported by both Bekaert and Harvey (1995) as well as Carrieri, Errunza and Hogan (2002). One must also not equate liberalization with integration. Indeed, Bekaert, Harvey and Lumsdaine (2002b) report that the endogenous dates of integration occur later than the exogenous break dates. Nonetheless, the standard International Asset Pricing Models (IAPMs) and the available evidence suggest that we would expect a decline in the cost of capital and an increase in the stock price upon the liberalization announcement. The actual price increase would depend on the credibility of the announcement as

⁷ This is a narrower definition than that used in the development economics literature which may include market and general economic reforms. We use the terms financial and stock market liberalization interchangeably.

well as the diversification potential of the market.⁸ In the months preceding and on the liberalization date, there will be further price increases due to the resolution of the residual uncertainty. These increases will be followed by normal equilibrium expected returns post liberalization. It is important to note that the lowering in the cost of capital is premised on the assumption that EM firms will be priced in the global context. Since the available evidence suggests that the foreigners prefer large firms, we would expect greater revaluation of larger firms.⁹ Indeed, Chari and Henry (2004) report a firm-specific revaluation of 6.8 percent for investible firms as opposed to no firm-specific revaluation for non-investible firms.¹⁰

There is also a recent literature on the relation between capital flows and returns. The stock returns may change across the liberalization period simply from price pressures arising from new World demand. When a country liberalizes, foreigners are now allowed to invest in stocks listed on the local exchange and some of these stocks will get included in country and emerging market indices. The mere inclusion of a stock in an index may well increase the price of that stock due to a jump in demand from index funds and other investors.¹¹

On liberalization, the increase in stock prices from capital flows may be temporary (price pressure) or permanent (lowering of cost of capital). Bohn and Tesar (1996) uncover evidence of a delayed response of U.S. net portfolio flows to returns. Choe, Kho, and Stulz (1999) examine the case study of Korea during the Asian crisis period of 1997 and again confirmed the positive feedback effect among foreign investors. Using custodian data on daily international portfolio flows, Froot, O'Connell and Seasholes (2001) find that flows lagging returns account for 80% of the total variation in returns, while contemporaneous and flows leading returns capture 4% and 16%, respectively. Bekaert, Harvey and Lumsdaine (2002a) find that the return effect is not a pure price pressure effect because it is partially permanent.¹² On the other hand, using firm level data, Chari

⁸ See, for example, Stulz (1999), Errunza and Miller (2000), Bekaert and Harvey (2003) and Chari and Henry (2003). Similarly, Bailey and Jagitiani (1994) and Bailey, Chung and Kang (1999) explain the revaluation effect on the basis of increased foreign portfolio investor demand for domestic securities.

⁹ The decline in expected returns would also be driven by the diversification potential the firm offers to foreign investors. In Errunza and Losq (1985), an EM firm that can be duplicated by globally available securities will be priced as though the market is fully integrated even under barriers to portfolio flows i.e. prior to liberalization. Errunza and Miller (2000) show that firms with highest diversification potential experience the largest decrease in their cost of capital. Further, their largest firms provide diversification benefit during the period preceding the ADR announcement.

¹⁰ Under simplifying assumptions on risk aversion, Chari and Henry (2003) show that the expected returns will fall for firms whose exposure to systematic risk decreases and rise for those whose exposure increases.

¹¹ Empirical evidence of price pressures, or equivalently, downward sloping demand curves, can be found even in developed markets. Harris and Guerel (1986) and Shleifer (1986) investigate the price effect of a stock's inclusion in the S&P500 index, and Warther (1995) considers the effect of U.S. mutual fund flows on returns.

¹² See Karolyi and Stulz (2002) and Bekaert, and Harvey (2003) for a full discussion and references.

and Henry (2004) assess the evidence of price pressure by comparing the behavior of investible versus non-investible stocks. They find little evidence of price pressure driven by index inclusion. Given the mixed evidence, the issue needs further study. If the price pressures are operative following liberalization, we would expect the larger investible firms to be more affected. In assessing the post liberalization performance, we omit an 8-month window including the liberalization month. This is partly intended to filter out price pressures, but nevertheless, price pressures could persist longer, an issue we leave for future research.

Theory does not provide any firm guidance as to the expected post liberalization performance. We do know that the large EM firms typically have preferred access to resources in a developing economy. If financial liberalization is part of a broad reform policy that liberates labor markets, provides a more competitive environment for (import of) technology and raw materials, and reduces the cronyism/government role in allocation of projects/resources, then we would expect smaller firms to better be able to realize their growth potential. Over time, the process of integration and investibility would also extend to smaller firms through spill-over and growth. These expectations would be reflected in the post liberalization returns of smaller firms.

There is also no established theory regarding the impact on volatility following liberalization. In a largely segmented market, volatility may be high if prices deviate a lot from fundamental values or if the price process is very erratic from thin trading. On the other hand, if liberalization leads to greater efficiency so that new information is quickly reflected in asset prices, we may observe higher volatility. Further, it has been suggested that foreign portfolio investments increase volatility, especially the short term flows. Overall, as EMs develop, the increased depth and breadth should lead to a lower volatility resembling today's developed markets. The empirical evidence based on index level data seems neutral. For example, Tesar and Werner (1995) find no relationship between the volume of U.S. transactions in foreign equity and the volatility of stock returns. Errunza (2001) reports decrease in unconditional volatility in the post liberalization period. Bekaert and Harvey (2000) control for various financial and macroeconomic development indicators and conclude that the impact of market liberalization on return volatility is economically and statistically insignificant.¹³

With respect to the relationship between liberalization and correlations, the gradual removal of barriers to international investment could lead to a progressive increase in the international

¹³ Also see, De Santis and Imrohorglu (1997) and Kim and Singal (2000).

correlation of financial markets due to the globalization of the discount rate or increased cash flow correlation. However, the available index level evidence suggests no meaningful change. For example, Errunza (2001) reports no appreciable change in unconditional correlations. However, his results do not take into account other events that might affect correlations. Bekaert and Harvey (2000) control for other factors and conclude that while correlations with World markets increase after liberalization, economically, the increase is too small to diminish diversification benefits. Similarly, Carrieri, Errunza and Hogan (2002) show that the conditional correlations have not changed substantially in the 1990s in spite of increasing opportunities for international investors to access emerging markets.

3. Stock Market Liberalization and Data

3.1 Market Liberalization Dates

The official government announcement date is often used as a proxy for the stock market liberalization date. However, the mere governmental announcement of market opening may not induce foreign investment. On the other hand, stock market restrictions may not have been binding and other avenues for foreign investment, most notably country funds, may have preceded the official opening. Hence, it is very difficult to pinpoint the exact market liberalization date. Therefore, several additional proxies for dating stock market liberalization are used in empirical studies.¹⁴ Henry (2000a) constructs a set of liberalization dates based mainly on the official policy decree and country fund introductions. We use Henry's (2000a) market liberalization dates since our data set of 12 emerging markets matches his, and the dates in column (2) of his Table I represent the earliest verifiable liberalization implementation dates.¹⁵ Further, his liberalization dates put relatively more weight on the introduction of country funds (for eight of the twelve countries), which is consistent with the empirical evidence of Errunza, Hogan and Hung (1999) that suggest the importance of these indirect vehicles to obtain exposure to otherwise closed markets. Since these are implementation and not announcement dates we estimate the revaluation effect over a generous window preceding the liberalizations as is done in past studies.

¹⁴ For example, Bekaert and Harvey (2000) use four liberalization dates based on the official announcement, country fund and ADR introduction and capital flows.

¹⁵ Table II of Henry (2000a) compares his liberalization dates with those of Bekaert and Harvey (2000), Kim and Singal (2000) and Buckberg (1995). In only three out of twelve cases, Henry's dates were preceded by those proposed by the other authors. Unfortunately, Henry could not verify their accuracy.

3.2 Data

We use both market-level and firm-level data from the Standard & Poor's (S&P) IFC Emerging Market Data Base (EMDB). The Morgan Stanley Capital International (MSCI) World market index from Datastream is used as a proxy for World market return and the S&P 500 return series from CRSP represents U.S. returns. All returns are logarithmic and in US\$.¹⁶

IFC uses size, liquidity and industry as criteria in selecting stocks to include in a country index which results in the inclusion of the largest and the most actively traded stocks on the major exchange of each market. These selected firms are representative of the industrial classification of the market with a target coverage of 60% of the total market capitalization at the end of each year and 60% of total value of shares traded during each year.¹⁷

We use the value-weighted global indices (IFCG) for 12 markets. Monthly return data were available from January 1976 to October 1999 for seven countries (Argentina, Brazil, Chile, India, Korea, Mexico and Thailand) and from January 1985 to October 1999 for five countries (Colombia, Malaysia, Philippines, Taiwan and Venezuela). These 12 emerging markets are also used in Henry (2000a).¹⁸

Our individual firm data are also from the EMDB for the same 12 emerging markets. The number of companies in each country index (IFCG) as of their respective liberalization date is presented in Table 1. Thailand has the smallest number of firms (10) and Mexico has the largest number of firms (52). The IFCG country indices consist of 28 firms on average across the 12 emerging markets. There are a total of 332 firms in the 12 emerging markets as of the market liberalization date. Market capitalization is reported as the average value for the 8 months leading up to and including the stock market liberalization date. We define this period as the *DurLib* period.

The number of firms under the All Firms in Individual Firm Data in Table 1 should be identical to the number of firms under IFCG Index. However, there is a discrepancy (332 vs. 305) because we exclude firms which do not exist for the entire 8-month *DurLib* period. Most of the countries have the same number of firms, but in particular India shows a discrepancy of 22 firms which were in the index but which did not exist throughout the liberalization period.

¹⁶ We also carried out the analysis on real and excess returns and found no qualitative differences.

¹⁷ See International Finance Corporation (1999) for more detailed information about the IFC indices.

¹⁸ We do not report descriptive statistics for the market indices here, as they are similar to those reported in the past literature.

The last five columns in Table 1 show the extent to which large firms dominate the country indices. The values for market capitalization are based on the average value in the 8-month *DurLib* period. The first four columns present how much the IFCG index is dominated by either the top 10 largest or the top 5 largest firms in each country. The dominance ratio for the largest 10 firms ranges from 54% for Mexico to 99.6% for Thailand and the average dominance ratio across all markets is 78.5%. With the top 5 firms in each market the dominance ratio decreases somewhat. For example, the dominance ratio ranges from 34.4% for Mexico to 83.2% for Thailand and the average dominance ratio decreases to 56.6%. These dominance measures are in absolute terms in the sense that they do not consider the total number of firms in the index (market).

In the last column, the Concentration Ratio (CNR) presents a modified Herfindahl index of concentration, previously applied by Roll (1992) and Bekaert and Harvey (1997, 2000). It complements the absolute dominance measures by taking the number of firms in the market (index) into account. If one stock dominates, then CNR approaches one. If every stock has equal market capitalization, then CNR equals zero. We take the CNR of S&P500 as our benchmark, which was 0.10 as of 7 Dec. 2000. Compared to this benchmark value, the relative concentration degree in emerging markets is higher, ranging from 0.15 to 0.31. The average CNR across all the emerging markets is 0.23, which is twice the benchmark value of the S&P 500.

Since we use firm size, represented by its market capitalization, as a proxy for foreign investor demand it plays an important role in our study. Table 2 presents the descriptive statistics of size measures for individual firms in 12 emerging markets. All the figures are based on the average value of the eight-month *DurLib* period. In the case of all countries, firm sizes vary widely ranging from 0.69 to 2,197.36 million US dollars. This wide dispersion of firm size is evident within each country as well. Having taken an initial look at the data, we now turn to a discussion of the empirical methodology to be employed below.

4. Methodology

4.1 Econometric Analysis

The general econometric framework is as follows:

$$DV_{sit} = \alpha_{si} + \gamma Lib_{it} + \delta f(size_{si}) Lib_{it} + \lambda CV_{it} + \varepsilon_{sit}$$

where DV_{sit} is our variable of interest for firm s in country i at time t , α_{si} is a firm-specific fixed effect, $f(size_{si})$ is a function of firm size, CV_{it} is a controlling variable, and ε_{sit} is the error term. We

are typically interested in the parameters γ and δ being significantly different from zero during a certain period either around or after the liberalization date, which is captured by the dummy variable Lib_{it} . Panel regressions with weighted least squares (WLS) estimation are run and statistical inference is based on heteroskedasticity-consistent (White) standard errors.

4.2 The Revaluation Effect

In order to compare firm-specific estimates of the revaluation effect with the existing literature based on country indices, we first estimate the standard equation using the IFCG indices, which serves as the benchmark:

$$R_{it} = \alpha_i + \gamma DurLib_{it} + \varepsilon_{it} \quad (1)$$

where R_{it} is the monthly US dollar log-return on the IFCG index in country i at time t . The liberalization dummy here takes the value one in the eight-month $DurLib$ period, and zero in the earlier months.¹⁹ The normal level of return is calculated on the basis of estimation window ranging from the earliest data available to the 7th month before stock market liberalization. The coefficient γ measures the monthly abnormal return during liberalization. We do not include sample points after the liberalization month since the expected post-liberalization decrease in the cost-of-capital may tend to overestimate the revaluation effect.²⁰

We compare this country-panel with a firm-specific unconditional estimate, which should yield an estimate of the revaluation effect similar to the one obtained using the IFCG indices. The firm-specific but unconditional regression is

$$R_{sit} = \alpha_{si} + \gamma DurLib_{it} + \varepsilon_{sit} \quad (2)$$

Note that the revaluation effects from the IFCG and the unconditional firm-specific regressions are not expected to be identical, since not all firms in the index are represented in our sample, the index

¹⁹ Since market liberalization is not a one-shot event, but rather a gradual process, it's not an easy task to pin down the exact liberalization date. The announcement is typically made before the actual market opening and the stock markets are likely to react to the announcement and its anticipation. In addition to the gap between announcement and implementation date, as Errunza and Miller (2000) argue, in practice there is likely to be information dissemination (leakage) prior to any official announcement. This 8-month window, also used by Henry (2000a), will potentially mitigate problems stemming from errors in the dating of the liberalization. For the same reason, Errunza and Miller (2000) use a 6-month period preceding the announcement and Bekaert and Harvey (2000) use 6 months prior to the liberalization month as an event window.

²⁰ In our result below we do indeed get a slightly lower revaluation effect than does Henry (2000a), who includes post-liberalization months in his sample. For example, while he reports a 37.6% increase in the stock price before controlling for any confounding effects, we obtain a 34.7% increase. Note that Henry (2000a) uses real returns whereas our returns are nominal US\$ returns.

is value-weighted, and since we use firm-specific fixed effects. More interestingly, we subsequently report additional conditional estimates.

A key contribution of this study is to assess the extent to which the revaluation effect is a function of firm size. Due to the extreme cross-sectional variation in firm size, we use a rank-based measure of size. Rank-based size is calculated in one of two ways. First, we measure the rank of a firm in relation to all firms in the World (305 firms in the 12 emerging markets) on a scale from 0 to 1, with 1 corresponding to the largest firm in the sample based on market capitalization and $1/305$ corresponding to the smallest firm in the World. This variable is denoted, $WRank(size_{si})$. We also calculate a country-by-country, or domestic rank size measure in a similar fashion, and denote it $DRank(size_{si})$. Size itself is measured as the average market capitalization of each firm during the 8-month $DurLib$ period.

We can then estimate the conditional revaluation effect based on the World rank size measure using the regression,

$$R_{sit} = \alpha_{si} + \gamma DurLib_{it} + \delta WRank(size_{si}) DurLib_{it} + \varepsilon_{sit} \quad (3)$$

and the conditional revaluation effect based on domestic rank size measure using the regression,

$$R_{sit} = \alpha_{si} + \gamma DurLib_{it} + \delta DRank(size_{si}) DurLib_{it} + \varepsilon_{sit} \quad (4)$$

Notice that the revaluation effects (RE) in these cases are not simply γ , but rather

$$RE_{si} = \gamma + \delta WRank(size_{si})$$

in the case of World rank size measure, and

$$RE_{si} = \gamma + \delta DRank(size_{si})$$

in the case of domestic rank size measure, both of which will be (nonlinear) functions of the nominal firm size.

The standard International Asset Pricing Models suggest a revaluation effect from market liberalization assuming that everything else is held constant. Thus, the event must be isolated from all other effects that might bear on the estimation. Hence, we re-estimate all the revaluation regressions after controlling for movements in World market returns and concurrent economic reforms. Further, in view of Henry's finding that policymakers time market openings, we also control for macroeconomic fundamentals.²¹

²¹ We use Henry's (2000a) variables for the concurrent economic reforms and macroeconomic fundamentals. The concurrent economic reforms variable is constructed using Henry's Table IV, which include events related to privatization, macroeconomic stabilization, exchange control easing and trade opening.

4.3 Post Liberalization Performance

The effect of market liberalization on performance is analyzed in a framework similar to the one used for the revaluation effect. One key difference is that the liberalization dummy now takes the value one in each of the 36 months following the liberalization month and zeros elsewhere. The sample ends 36 months after the liberalization month. We define the 36 months preceding and following *DurLib* period as *PreLib* and *PostLib* period respectively. The 8-month *DurLib* period is excluded from the analysis. The 36-month *PreLib* period is used as a control period to assess the change in performance from liberalizing capital markets.

We estimate the following regressions to investigate whether the performance changes after liberalization, and whether there are any cross-sectional differences depending on the size of the firm

$$R_{it} = \alpha_i + \gamma PostLib_{it} + \varepsilon_{it} \quad (5)$$

$$R_{sit} = \alpha_{si} + \gamma PostLib_{it} + \varepsilon_{sit} \quad (6)$$

$$R_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta WRank(size_{si}) PostLib_{it} + \varepsilon_{sit} \quad (7)$$

$$R_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta DRank(size_{si}) PostLib_{it} + \varepsilon_{sit} \quad (8)$$

We use realized returns to measure performance. As in the case of the revaluation effect, we re-estimate all the regressions after controlling for movements in World market returns, concurrent economic reforms and macroeconomic fundamentals, and check the robustness of our results to the choice of window length.

4.4 Volatility and Correlation

We again estimate the four regression models, now with volatility or correlation as the dependent variable.

$$V_{it}(CR_{it}) = \alpha_i + \gamma PostLib_{it} + \varepsilon_{it} \quad (9)$$

$$V_{sit}(CR_{sit}) = \alpha_{si} + \gamma PostLib_{it} + \varepsilon_{sit} \quad (10)$$

$$V_{sit}(CR_{sit}) = \alpha_{si} + \gamma PostLib_{it} + \delta WRank(size_{si}) PostLib_{it} + \varepsilon_{sit} \quad (11)$$

$$V_{sit}(CR_{sit}) = \alpha_{si} + \gamma PostLib_{it} + \delta DRank(size_{si}) PostLib_{it} + \varepsilon_{sit} \quad (12)$$

where $V(CR)$ denotes volatility (correlation). The windows for the performance test are applied here again, but now with 2-year window lengths.²²

Volatility itself is the log of realized standard deviation, using the sum of squares of monthly returns to construct an annual variance. We thus follow the approach of French, Schwert and Stambaugh (1987) and Schwert (1989), who use sum of daily squared observations to construct monthly, realized stock volatilities. This is a model-free estimation in the sense that we do not impose any parametric model to estimate variances. The annual realized correlation with World market return is similarly calculated from cross-products of monthly returns in the usual fashion. In order to control for effects arising from changes in World market volatility, we re-estimate the volatility and correlation regressions including realized World market volatility on the right hand side. As our volatility and correlation tests are done with annual data, we do not have enough cross-country variation to estimate the changes in volatility and correlation controlling for changes in the macroeconomic conditions. However, we perform a series of robustness tests in order to assess the sensitivity of our results to varying the test window lengths.

5. Empirical Results

We now report the empirical results from estimations of revaluation effect, performance, stock market volatility and correlation with World market return. The results are reported in Tables 3-10. For completeness, each table contains results with and without controlling variables. The two sets of results are very similar, and for the sake of brevity we will only discuss the results including the controlling variables.

5.1 Revaluation Effects

Table 3 provides the empirical results from testing the revaluation effect. After controlling for World market return, on average, the emerging stock market is revalued by 31.8% points (3.97% per month for eight months) over the *DurLib* period. On average, the emerging market firm is revalued by 26.5% points (3.31% per month for eight months). Since the benchmark estimate, using

²² The choice of window length attempts to balance the desire of getting a low-variance estimate of change (suggesting a long window), while avoiding confounding effects biasing the estimate of change (suggesting a short window). In the above analysis on performance, we apply 3-year windows surrounding the liberalization period as this is standard in the literature. When estimating changes in volatility and correlation, arguments can be made for a shorter window, as the volatility of returns, compared to the mean of return, is more easily estimated using a short span of data. We therefore use 2-year windows. Evidence on the robustness of the results to the choice of window length is presented below.

value-weighted IFCG indices, has a higher revaluation effect than the firm-specific unconditional estimate, we expect larger firms to display a higher revaluation effect than smaller ones. As the IFCG indices are value-weighted, more weight is given to larger firms whereas no explicit weight is given in the estimation using firm level data.

The firm-specific conditional estimates of γ and δ are significant in both regressions. The revaluation effect for the smallest firm using the World rank size measure is approximately 11.8% points and for the largest firm it is 37.4% points. Using instead the domestic rank size measure, the revaluation effect ranges from 10.9% to 37.7% points. Regardless of the size measure used, the results show that large firms experience higher revaluation effects than small firms.²³

Stock market liberalization usually coincides with concurrent changes in economic policy. We use four variables, namely macroeconomic stabilization, trade liberalization, privatization and the easing of exchange controls from Henry (2000a) to control for the effect of concurrent economic reforms (CER).²⁴ After controlling for these variables, the results reported in Table 4 are the same as before. The results for market indices and the firm-specific unconditional model show significant revaluation effects and there is a cross-sectional difference in the revaluation effect depending on the firm size. Large firms show a higher revaluation effect than small firms. The coefficient on the privatization variable is positive and significant as in Henry (2000a). However, the stabilization variable is unexpectedly negative and highly significant. The exchange rate coefficient is negative as in Henry (2000a) but in our case it is also significant.

Following Henry (2000a) the stabilization dummy is constructed from events which include IMF programs. Although we use the same concurrent economic reforms as Henry, our differences may result from discrepancies in event classifications, the use of firm level data in this study and the differences in sample periods. Notice also however that Henry (2002) finds that when IMF programs are announced in the midst of inflation that is less than 40 percent per year, there is a negative effect on the stock market during the pre-stabilization announcement window. As our sample includes a number of countries which had inflation rates below 40 percent this could explain the negative coefficient we find on the stabilization variable.

Finally, we control for four macroeconomic fundamental (MF) variables to account for the possibility of a revaluation from macroeconomic shocks. As in Henry (2000a), we use the

²³ Patro and Wald (2003) report an unconditional average increase in returns across countries of 3.16 percent per month and 1.5 percent per month across equally weighted firms. Surprisingly, they obtain a greater revaluation impact for smaller firms.

continuously compounded growth rates of domestic industrial production, domestic inflation, the 3-month US T-bill rate and the real exchange rate. The basic results do not change and are not reported in order to conserve space. However, it is important to note that the decline in revaluation effect at the market and average firm level from the no-control benchmark estimates to the estimates with World market return, CER and MF controls are of the same order as those reported by Henry (2000a).

In summary, our results are consistent with the expectation of a decline in the cost of capital and the foreigners' preference for large firms. Further, our analysis suggests that large firms are driving the revaluation effect. This is reasonable as domestic investors could be anticipating foreign investors' demand for equity in large firms, thus driving up the valuations even before the market liberalization takes place. Alternatively, if de facto liberalization has already taken place before the liberalization dates used here then foreign investors themselves could be driving up the valuations.

5.2 Post Liberalization Performance

Table 5 provides empirical results from testing the effect of market liberalization on performance. After controlling for changes in World market return, the benchmark coefficient γ of 0.0114 is statistically significant which indicates that the performance increases by 13.7% points per annum on average after stock market liberalization. The firm-specific unconditional estimate is also significant and suggests that the performance increases by 10.7% points per annum for the average firm.

The results for the firm-specific conditional estimation suggest a change in the performance for the World's smallest firm of approximately 26.7% points per year and for the World's largest firm -0.8% points per year. Similarly, the change in the performance for the smallest firm using the domestic rank size measure is approximately 26.1% points and that for the largest firm it is 0.4% points per year. Thus, while small firms show positive changes, the change in the performance for large size firms are close to zero.²⁵ As in the case of the revaluation effect, we re-estimated our results after controlling for concurrent economic reforms. The results are detailed in Table 6. Again, the firm size is negatively related to performance changes. Small firms show improved performance, whereas large firms show insignificant changes in performance. As in the case of revaluation effect, the coefficient for the privatization variable is positive and significant whereas the exchange rate

²⁴ See Henry (2000a) for an excellent discussion of the need to control for CER and macroeconomic fundamentals.

variable is significantly negative. After controlling for macroeconomic fundamentals, the basic results do not change and are again not reported in order to conserve space.

We also checked the robustness of our results based on *PreLib* and *PostLib* windows with symmetric 2 to 5-year lengths. We find that our results are robust. Small firms show improved performance whereas large firms show only small changes in performance. Overall, our results are consistent with relaxation of resource constraints and as a result, improved growth opportunities for smaller firms post liberalization. Over time, the process of integration and investibility would be expected to extend to smaller firms through spill-overs and growth, expectations that would be reflected in the post liberalization returns of smaller firms.

In the above regressions, we omit an 8-month window including the liberalization month. This is partly intended to filter out price pressures, but nevertheless, price pressures could persist longer. In this case, our finding of increases in returns post liberalization could be evidence of price pressures. The fact that the post liberalization returns are relatively high for small firms suggests that price pressures may be at play.

5.3 Changes in Volatility

Table 7 presents the empirical results from testing changes in stock market volatility. As the market volatility changes could easily be affected by changes in World market volatility, the second set of columns in Table 7 report the results after controlling for this. The benchmark estimate suggests that the annualized emerging stock market volatility increases by 26.2%, whereas the firm-specific unconditional estimate implies an average increase in firm-level volatility by only 4.8%.²⁶

The conditional estimates suggest that the change in the annualized volatility for the World's smallest firm is approximately 9.5%, and that for the World's largest firm it is 0.7%. Using domestic ranks, the change in volatility for the smallest firm is approximately 6.6%, and for the largest firm it is 3.4%.²⁷

²⁵ Patro and Wald (2003) also report higher returns for small firms in their post liberalization period.

²⁶ Since we use the log of realized volatility, our results can loosely be interpreted as percentage changes, unlike the changes in percentage *points* in the previous sections on revaluation effect and performance. The difference in logarithm is of course a poor approximation to the percentage change when the log difference is large.

²⁷ In terms of robustness of our results based on *PreLib* and *PostLib* windows with symmetric 2 to 5-year lengths, large firms show much lower increases in volatility than small firms after stock market liberalization, but the differences are not statistically significant.

While the evidence of previous studies based on market indices is neutral, we find that volatility increases significantly after market liberalization—in particular for small firms.²⁸ We also find that the increases in market-level volatility are quite dramatic when compared to the firm-level increases. This finding deserves further scrutiny. Since we use annualized data, we are not able to control for concurrent economic reforms. Table 8 reports results with macroeconomic fundamentals as control variables. Now, the country index level results show negative but insignificant changes in volatility consistent with the findings of Bekaert and Harvey (2000) who report that annualized volatility slightly decreases (by one basis point). Our results at the index level are also consistent with their finding that both the financial and macroeconomic development indicators suggest a considerable decrease in volatility offset by an increase in volatility attributed to financial liberalization. At the firm level, we find the effect to be very significant. Whereas the large firms exhibit large declines in volatility, the decline for small firms is less pronounced.

5.4 Changes in Correlation with the World Market Return

Table 9 presents the empirical results for changes in correlation of stock returns with World market returns. Recent studies have shown that correlations of international equity returns move together with World market volatility. This phenomenon becomes apparent during an extremely volatile period when correlations increase markedly. (see Solnik et. al. (1996), De Santis and Gerard (1997) and Longin and Solnik (1995, 2001) among others). Since our sample period includes very volatile periods such as the 1987 crash, our results could be affected by changes in World market volatility. Hence, the second set of columns in Table 9 shows the results after controlling for changes in the World market volatility measured by the annualized realized volatility of MSCI World returns. The result for the benchmark model suggests no change in correlation after stock market liberalization. The firm-specific unconditional estimate is statistically significant, implying that the correlation with World market return decreases slightly.

The firm-specific conditional estimate using the World rank size-measures suggests that firm size matters for the correlation changes from stock market liberalization. The change in correlation for the World's smallest firm is -0.1053 and that for the World's largest firm is 0.0589 .²⁹ Using

²⁸ Recall that previous studies typically estimate volatility using mean-reverting GARCH-type models. Instead, we take a model-free approach.

²⁹ We checked the robustness of our results based on *PreLib* and *PostLib* windows with symmetric 2 to 5-year lengths. Large firms consistently show significant increases whereas small firms show decreases in the correlation with the world market.

instead domestic ranks, γ and δ become insignificant. These results are consistent with those of Bekaert and Harvey (2000) who report a small but economically insignificant increase in index level correlations between emerging markets and the World market return. Our findings are again consistent with foreign investors demanding equity in large and well-known firms.

Table 10 reports results with macroeconomic fundamentals as control variables. Again, the market level results show insignificant changes in correlation. With individual firm data, the correlations on average decrease with large firms showing insignificant changes and small firms exhibiting significant declines based on both the World and the domestic size rank.

6. Conclusion and Discussions for Future Work

We attempt to answer the following key questions: What are the revaluation effects and the impact on performance, volatility, and correlation from stock market liberalization in emerging markets? These questions have been studied extensively at the market-level, using for example, IFC country indices, but not at the firm level. From the perspective of the host economy, it is important to know whether the benefits accrue to the few large firms or they trickle down to the smaller firms. Further, given the foreign investor preference for large firms, the opening of capital markets should have a differential impact across securities. It is also important for foreign investors to learn about the behavior of smaller firms that constitute future diversification opportunities. Hence, we use individual firm data to assess the extent to which these effects are a function of firm size.

Our test results using country indices show statistically and economically significant revaluation effects, and improved performance. However, neither the emerging stock market volatility nor its correlation with World market return change after stock market liberalization. More importantly, we report significantly different impacts of stock market liberalization based on firm size. Large firms tend to exhibit large revaluation effects, insignificant change in performance, large declines in volatility, and insignificant change in correlation from liberalization. Small firms show small revaluation effects, improved performance, smaller declines in volatility and decreases in correlation after liberalization. Thus, we find that there are significant cross-sectional differences in the impact of stock market liberalization on firms depending on their size. These results hold after controlling for movements in World stock returns, concurrent economic reforms and macroeconomic fundamentals. They are also robust to the length of the liberalization window.

In this study, we adopt only one firm-specific characteristic, namely firm size, using it as a proxy for the foreign investors' demand. Illiquidity is also considered to be a critical impediment to investing in emerging markets. Hence, liquidity measures can be used as conditioning factors to investigate the impact of stock market liberalization. We leave this important issue for further study pending the availability of reliable data.

References

- Bailey, Warren and Julapa Jagtiani, 1994. Foreign ownership restrictions and stock prices in the Thai capital market, *Journal of Financial Economics* 36, 57-87.
- Bailey, Warren, Peter Chung and Jun-Koo Kang, 1999. Foreign ownership restrictions and equity price premiums: what drives the demand for cross-border investments? *Journal of Financial and Quantitative Analysis* 34, 489-511.
- Bekaert, Geert and Campbell Harvey, 1995. Time Varying World Market Integration, *Journal of Finance* 50, 403-444.
- Bekaert, Geert and Campbell Harvey, 1997. Emerging equity market volatility, *Journal of Financial Economics* 43, 29-77.
- Bekaert, Geert and Campbell Harvey, 2000. Foreign speculators and emerging equity markets, *Journal of Finance* 55, 565-613.
- Bekaert, Geert, Campbell Harvey, and Robin Lumsdaine, 2002a. The dynamics of emerging market equity flows, *Journal of International Money and Finance* 21, 295–350.
- Bekaert, Geert, Campbell Harvey, and Robin Lumsdaine, 2002b. Dating the Integration of World Equity Markets, *Journal of Financial Economics* 65, 203-247.
- Bekaert, Geert, Campbell Harvey and Christian Lundblad, 2002. Does Financial liberalization spur growth? *Journal of Development Economics*, Forthcoming.
- Bekaert, Geert and Campbell Harvey, 2003. Emerging Markets Finance, *Journal of Empirical Finance* 10, 3-55.
- Bohn Henning and Linda Tesar, 1996. U.S. Equity Investment in Foreign Markets: Portfolio Rebalancing or Return Chasing? *American Economic Review: Papers and Proceedings*, May, 77-81.
- Buckberg, Elaine, 1995. Emerging stock markets and international asset pricing, *World Bank Economic Review* 9, 51-74.
- Carrieri, Francesca, Vihang Errunza and Ked Hogan, 2002. Characterizing world market integration through time, Working paper, McGill University.
- Chari Anusha and Peter Blair Henry, 2004. Risk Sharing and Asset Prices: Evidence From a Natural Experiment, *Journal of Finance*, Forthcoming.
- Choe, Hyuk, Bong-Chan Kho and Rene Stulz, 1999. Do foreign investors destabilize stock markets? The Korean experience in 1997, *Journal of Financial Economics* 54, 227-264.
- Chuhan, Punam, 1994. Are institutional investors an important source of portfolio investment in emerging markets? Policy Research working paper 1243, World Bank.

- Cooper, Ian and Evi Kaplanis, 1994. Home bias in equity portfolios, inflation hedging and international capital market equilibrium, *Review of Financial Studies* 7, 45-60.
- Dahlquist Magnus, Lee Pinkowitz, René M. Stulz, and Rohan Williamson, 2003. Corporate Governance and the Home Bias, *Journal of Financial and Quantitative Analysis* 38, 87-110.
- De Santis, Giorgio and Bruno Gerard, 1997. International asset pricing and portfolio diversification with time-varying risk, *Journal of Finance*, 52, 1881-1912.
- De Santis, Giorgio and Selahattin Imrohorglu, 1997. Stock returns and volatility in emerging financial markets, *Journal of International Money and Finance* 16, 561-579.
- Errunza, Vihang, and Etienne Losq, 1985. International asset pricing under mild segmentation: theory and test, *Journal of Finance* 40, 105-124.
- Errunza, Vihang, Ked Hogan and Mao-Wei Hung, 1999. Can the gains from international diversification be achieved without trading abroad, *Journal of Finance* 54, 2075-2107.
- Errunza, Vihang and Darius Miller, 2000. Market segmentation and the cost of capital in international equity markets, *Journal of Financial and Quantitative Analysis* 35, 577-600.
- Errunza, Vihang, 2001. Foreign Portfolio Equity Investments, Financial Liberalization and Economic Development, Special issue of *Review of International Economics*, International Financial Liberalization, Capital Flows and Exchange Rate Regimes: Essays in Honor of Robert A. Mundell. Volume 9, 703-726.
- French, Kenneth and James Poterba, 1991. International diversification and international equity markets, *American Economic Review* 81, 222-226.
- French, Kenneth, Willam Schwert and Robert Stambaugh, 1987. Expected stock returns and volatility, *Journal of Financial Economics* 19, 3-29.
- Froot, Kenneth, A., Paul G. J. O'Connell, and Mark S. Seasholes, 2001. The portfolio flows of international investors, *Journal of Financial Economics* 59, 151-194.
- Harris, Lawrence and Eitan Guerel, 1986. Price and volume effects associated with the new S&P500 list: New evidence for the existence of price pressures, *Journal of Finance* 41, 815-829.
- Henry, Peter Blair, 2000a. Stock market liberalization, economic reform, and emerging market equity prices, *Journal of Finance* 55, 529-564.
- Henry, Peter Blair, 2000b. Do Stock market liberalizations cause investment booms? *Journal of Financial Economics* 58, 301-334.
- Henry, Peter Blair, 2002. Is Disinflation Good for the Stock Market? *Journal of Finance* 57, 1617-1648

- International Finance Corporation, 1999. IFC Indices: methodology, definitions and practices, IFC World Bank, Washington, D.C.
- Kang, Jun-Koo and Rene M. Stulz, 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan, *Journal of Financial Economics* 46, 2-28.
- Karolyi, G. Andrew, and Rene M. Stulz, 2002. Are financial assets priced locally or globally? NBER Working Paper 8994.
- Kim, E. Han and Vijay Singal, 2000. Stock market opening: Experience of emerging economies, *Journal of Business* 73, 25-66.
- Lewis, Karen K., 1999. Trying to explain home bias in equities and consumption, *Journal of Economic Literature* 37, 571-608.
- Longin, Francois and Bruno Solnik, 1995. Is the correlation in international equity returns constant: 1960-1990? *Journal of International Money and Finance* 14, 3-26.
- Longin, Francois and Bruno Solnik, 2001. Extreme correlation of international equity markets, *Journal of Finance*, 56, 649-676.
- Merton, Robert C., 1987. A simple model of capital market equilibrium with incomplete information, *Journal of Finance* 42, 483-510.
- Patro, Dilip, and John Wald, 2003. Firm Characteristics and the Impact of Emerging Market Liberalizations, Manuscript, Department of Finance and Economics, Rutgers Business School.
- Roll, Richard, 1992. Industrial structure and the comparative behavior of international stock market indexes, *Journal of Finance* 47, 3-42.
- Schwert, William, 1989. Why does stock market volatility change over time? *Journal of Finance* 44, 1115-1154.
- Shleifer, Andrei, 1986. Do demand curves for stocks slope down? *Journal of Finance* 41, 579-590.
- Solnik, Bruno, Cyril Boucrelle and Yann Le Fur, 1996. International market correlation and volatility, *Financial Analysts Journal* 52, 17-34.
- Stulz, Rene M., 1981. On the effects of barriers to international investment, *Journal of Finance* 36, 923-934.
- Stulz, Rene M., 1999. Globalization of equity markets and the cost of capital, *Journal of Applied Corporate Finance*, Fall, 8-25.

Tesar, Linda and Ingrid Werner, 1995. U.S. equity investment in emerging stock markets, *World Bank Economic Review* 9, 109-130.

Warther, V.A., 1995. Aggregate mutual fund flows and security returns, *Journal of Financial Economics* 39, 209–235.

Table 1: Individual Firm Data

No. of Stocks is the number of companies as of the market liberalization date. Market Cap. is the average value of 8-month *DurLib* period. For example, Top 10(5) firms are chosen on the basis of firm size calculated as average market capitalization for 8-month *DurLib* period and its Market Cap. is the sum of these largest 10 (5) firms' average market capitalization for the same period. No. of Stocks under Individual Firm Data count the number of firms, which exist during the entire 8-month *DurLib* period.

Markets	IFCG Index		Individual Firm Data							CNR ²
	No. of Stocks	Market Cap. ¹	All Firms			Top 10 firms		Top 5 firms		
			No. of Stocks	Market Cap.	% in IFCG	Market Cap.	% in IFCG	Market Cap.	% in IFCG	
Argentina	24	2,824	24	2,823	99.9	2,310	81.8	1,663	58.9	0.26
Brazil	30	5,433	28	5,208	95.8	4,176	76.9	2,967	54.6	0.22
Chile	25	2,070	25	2,070	100	1,602	77.4	1,166	56.4	0.24
Colombia	20	1,934	20	1,934	100	1,603	82.9	1,037	53.6	0.19
India	47	5,570	25	4,485	80.5	3,475	62.4	2,762	49.6	0.31
Korea	23	5,893	21	4,903	83.2	4,156	70.5	2,716	46.1	0.20
Malaysia	40	11,499	40	11,499	100	8,767	76.2	5,775	50.2	0.24
Mexico	52	9,172	52	9,172	100	4,957	54.0	3,154	34.4	0.15
Philippines	18	346	18	346	100	314	90.7	246	71.0	0.26
Taiwan	30	4,111	29	4,088	99.5	2,977	72.4	2,228	54.2	0.22
Thailand	10	2,916	10	2,905	99.6	2,905	99.6	2,425	83.2	0.25
Venezuela	13	784	13	784	100	758	96.8	527	67.3	0.20
Total	332	52,557	305	50,222		38,004		26,670		
Average	28	4,379	25	4,185	96.6	3,167	78.5	2,222	56.6	0.23

1. Market capitalization in millions of US\$
2. Concentration Ratio (CNR): The Absolute Concentration measure using the largest firms (Top 10 or Top 5) does not consider the total number of companies in the market. A modified Herfindahl index of concentration below is used to complement the absolute concentration measure.

$$CNR_{i,t} = \sqrt{\frac{N_{i,t}}{N_{i,t} - 1} \sum_{j=1}^{N_{i,t}} \left(w_{ji,t} - \frac{1}{N_{i,t}} \right)^2}$$

where $N_{i,t}$ is the number of companies in the country i at time t and $w_{ji,t}$ is the share of market capitalization of stock j in the country i at time t . If one stock dominates, then CNR approaches one. If every stock has equal market capitalization, then CNR equals zero.

Table 2: Descriptive Statistics on Firm size (Market Capitalization)

Firm size is based on the average market capitalization value in the 8-month *DurLib* period. All figures are in millions of US\$. The emerging markets data are from Emerging Market Database of the International Financial Corporation. EMs include Argentina(ARG), Brazil(BRA), Chile(CHI), Colombia(COL), India(IND), Korea(KOR), Malaysia(MAL), Mexico(MEX), the Philippines(PHI), Taiwan(TAI), Thailand(THA) and Venezuela(VEN).

	Mean	Median	Standard Deviation	Kurtosis	Skewness	Minimum	Maximum	Count
All countries	164.66	80.27	235.65	20.46	3.58	0.69	2197.36	305
<u>Individual Country</u>								
ARG	117.62	76.54	149.26	6.49	2.44	0.69	634.00	24
BRA	186.01	126.17	216.08	0.83	1.37	10.29	749.86	28
CHI	82.81	49.66	98.27	5.99	2.41	7.08	412.85	25
COL	96.75	75.36	82.35	0.65	0.98	6.13	307.36	20
IND	179.42	102.68	279.96	11.56	3.36	7.97	1292.73	25
KOR	233.51	158.69	214.67	0.48	1.02	9.53	777.99	21
MAL	287.49	75.97	428.48	9.29	2.67	6.68	2197.36	40
MEX	176.40	104.60	185.93	4.01	1.99	9.43	817.50	52
PHI	19.26	7.74	21.14	0.77	1.30	0.78	72.42	18
TAI	140.99	83.20	165.62	4.21	2.23	10.87	643.40	29
THA	290.52	232.86	232.24	-1.41	0.45	20.85	635.12	10
VEN	60.32	63.61	43.10	-1.53	0.13	6.22	119.02	13

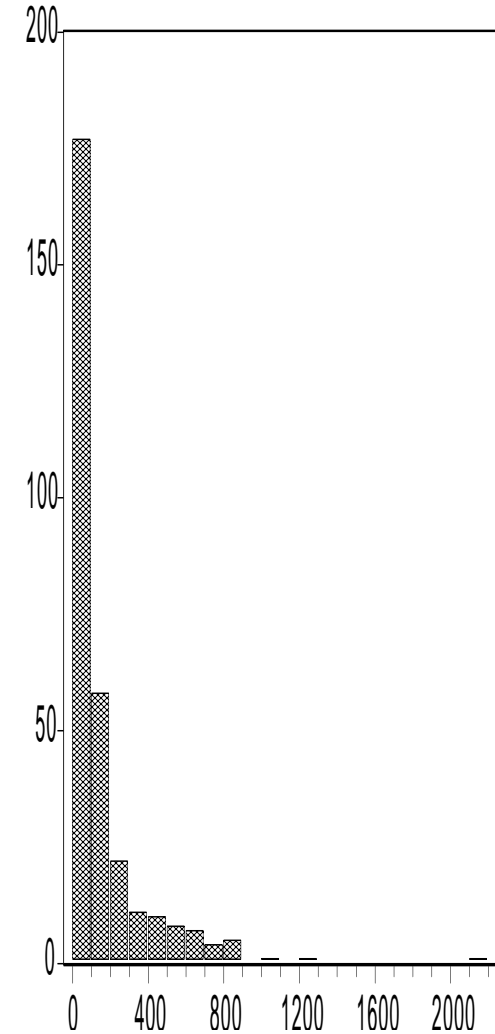


Table 3: Revaluation Effects

$$\begin{aligned}
 M1 \text{ (IFCG indices): } R_{it} &= \alpha_i + \gamma \text{DurLib}_{it} + [\lambda WRet_t] + \varepsilon_{it} \\
 M2 \text{ (Individual Firms): } R_{sit} &= \alpha_{si} + \gamma \text{DurLib}_{it} + [\lambda WRet_t] + \varepsilon_{sit} \\
 M3 \text{ (World Rank in Size): } R_{sit} &= \alpha_{si} + \gamma \text{DurLib}_{it} + \delta (WRank(size_{si}) * \text{DurLib}_{it}) + [\lambda WRet_t] + \varepsilon_{sit} \\
 M4 \text{ (Domestic Rank in Size): } R_{sit} &= \alpha_{si} + \gamma \text{DurLib}_{it} + \delta (DRank(size_{si}) * \text{DurLib}_{it}) + [\lambda WRet_t] + \varepsilon_{sit}
 \end{aligned}$$

The panel regressions are performed using monthly logarithmic returns of both IFCG indices and individual firms in 12 emerging markets. Data covers Jan. 1976 to the market liberalization date month in each country. For example, Argentina has data from Jan. 1976 to Nov. 1989. $R_{(s)it}$ is the logarithmic return for country i (for asset s in country i) at time t . DurLib_{it} is a dummy variable that takes on the value one in each of the 8 month DurLib period in country i . $\alpha_{(s)i}$ measures the average monthly return for country i (for firm s in country i) before market liberalization and γ measures the average monthly abnormal return after liberalization across all the countries (all the firms). $WRet_t$ is the logarithmic World market return (MSCI World Index). $WRank(size_{si})$ is a worldwide rank measure in firm size $\{=(\text{firm's rank in the World}/\text{total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market $i \{=(\text{firm's rank in the country}/\text{total number of firms in that market})\}$. The revaluation effect for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	Before Controlling for World Market Return				After Controlling for World Market Return			
	IFCG Indices	Firm: Average	Firm: World Rank	Firm: Domestic Rank	IFCG Indices	Firm: Average	Firm: World Rank	Firm: Domestic Rank
γ	0.0434 (5.11)	0.0371 (16.12)	0.0202 (3.32)	0.0176 (2.94)	0.0397 (4.65)	0.0331 (14.23)	0.0146 (2.39)	0.0128 (2.13)
δ			0.0292 (3.32)	0.0329 (3.85)			0.0321 (3.65)	0.0343 (4.00)
λ					0.2659 (4.15)	0.2720 (14.74)	0.2737 (14.82)	0.2727 (14.78)
No of cross sections	12	305	305	305	12	305	305	305
No of observations	1229	20687	20687	20687	1229	20687	20687	20687

**Table 4: Revaluation Effects
after Controlling for Concurrent Economic Reforms**

$$M1 \text{ (IFCG indices): } R_{it} = \alpha_i + \gamma DurLib_{it} + \lambda WRet_t + \phi CER + \varepsilon_{it}$$

$$M2 \text{ (Individual Firms): } R_{sit} = \alpha_{si} + \gamma DurLib_{it} + \lambda WRet_t + \phi CER + \varepsilon_{sit}$$

$$M3 \text{ (World Rank in Size): } R_{sit} = \alpha_{si} + \gamma DurLib_{it} + \delta WRank(size_{si}) * DurLib_{it} + \lambda WRet_t + \phi CER + \varepsilon_{sit}$$

$$M4 \text{ (Domestic Rank in Size): } R_{sit} = \alpha_{si} + \gamma DurLib_{it} + \delta DRank(size_{si}) * DurLib_{it} + \lambda WRet_t + \phi CER + \varepsilon_{sit}$$

The panel regressions are performed using monthly logarithmic returns of both IFCG indices and individual firms in 12 emerging markets. Data covers Jan. 1976 to the market liberalization date month in each country. For example, Argentina has data from Jan. 1976 to Nov. 1989. R_{sit} is the logarithmic return for country i (for asset s in country i) at time t . $DurLib_{it}$ is a dummy variable that takes on the value one in each of the 8 month $DurLib$ period in country i . $\alpha_{(s)i}$ measures the average monthly return for country i (for firm s in country i) before market liberalization and γ measures the average monthly abnormal return after liberalization across all the countries (all the firms). $WRet_t$ is the logarithmic World market return (MSCI World Index). Four dummy variables are used to control for the effect of the concurrent economic reforms (CER): Stabilization, Trade, Privatization and the easing of exchange control. $WRank(size_{si})$ is a worldwide rank measure in firm size $\{= (\text{firm's rank in the World}/\text{total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market $i \{= (\text{firm's rank in the country}/\text{total number of firms in that market})\}$. The revaluation effect for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	0.0273 (2.30)	0.0241 (7.90)	0.0072 (1.15)	0.0066 (1.08)
δ			0.0294 (3.39)	0.0304 (3.55)
λ	0.2627 (4.27)	0.2745 (14.93)	0.2762 (15.01)	0.2752 (14.97)
Stabilization	-0.0268 (-1.63)	-0.0210 (-5.15)	-0.0205 (-5.03)	-0.0206 (-5.05)
Trade	0.0076 (0.71)	0.0051 (1.54)	0.0049 (1.47)	0.0043 (1.31)
Privatization	0.0687 (4.16)	0.0538 (12.26)	0.0537 (12.23)	0.0533 (12.12)
Exchange rate	-0.0264 (-1.82)	-0.0194 (-4.18)	-0.0190 (-4.10)	-0.0193 (-4.16)
No of obs.	1229	20687	20687	20687

Table 5: Post Liberalization Performance

$$M1 \text{ (IFCG indices): } R_{it} = \alpha_i + \gamma PostLib_{it} + [\lambda WRet_t] + \varepsilon_{it}$$

$$M2 \text{ (Individual Firms): } R_{sit} = \alpha_{si} + \gamma PostLib_{it} + [\lambda WRet_t] + \varepsilon_{sit}$$

$$M3 \text{ (World Rank in Size): } R_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta(WRank(size_{si}) * PostLib_{it}) + [\lambda WRet_t] + \varepsilon_{sit}$$

$$M4 \text{ (Domestic Rank in Size): } R_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta(DRank(size_{si}) * PostLib_{it}) + [\lambda WRet_t] + \varepsilon_{sit}$$

The panel regressions are performed using monthly logarithmic returns of both IFCG indices and individual firms in 12 emerging markets. The data covers 36 months before and 36 months after market liberalization, excluding the 8-month *DurLib* period. $R_{(s)it}$ is the logarithmic return for country i (for asset s in country i) at time t . $PostLib_{it}$ is a dummy variable that takes on the value one in each of the 36 *PostLib* months in country i . $\alpha_{(s)i}$ measures the average monthly return for country i (for firm s in country i) before market liberalization and γ measures the average monthly abnormal return after liberalization across all the countries. $WRet_t$ is the logarithmic World market return (MSCI World Index). $WRank(size_{si})$ is a worldwide rank measure in firm size $\{=(\text{firm's rank in the World/total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market i $\{=(\text{firm's rank in the country/total number of firms in that market})\}$. The change in performance for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>Before Controlling for World Market Return</i>				<i>After Controlling for World Market Return</i>			
	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	0.0048 (0.98)	0.0023 (1.50)	0.0172 (4.22)	0.0156 (3.67)	0.0114 (2.41)	0.0089 (5.86)	0.0223 (5.52)	0.0223 (5.29)
δ			-0.0257 (-4.28)	-0.0219 (-3.63)			-0.0230 (-3.91)	-0.0220 (-3.69)
λ					0.4678 (6.19)	0.4493 (24.79)	0.4479 (24.70)	0.4492 (24.78)
No of cross sections	12	305	305	305	12	305	305	305
No of observations	795	17810	17810	17810	795	17810	17810	17810

**Table 6: Post Liberalization Performance
after Controlling for Concurrent Economic Reforms**

$$\begin{aligned}
 M1 \text{ (IFCG indices): } R_{it} &= \alpha_i + \gamma \text{PostLib}_{it} + \lambda WRet_t + \phi' \text{CER} + \varepsilon_{it} \\
 M2 \text{ (Individual Firms): } R_{sit} &= \alpha_{si} + \gamma \text{PostLib}_{it} + \lambda WRet_t + \phi' \text{CER} + \varepsilon_{sit} \\
 M3 \text{ (World Rank in Size): } R_{sit} &= \alpha_{si} + \gamma \text{PostLib}_{it} + \delta(WRank(size_{si}) * \text{PostLib}_{it}) + \lambda WRet_t + \phi' \text{CER} + \varepsilon_{sit} \\
 M4 \text{ (Domestic Rank in Size): } R_{sit} &= \alpha_{si} + \gamma \text{PostLib}_{it} + \delta(DRank(size_{si}) * \text{PostLib}_{it}) + \lambda WRet_t + \phi' \text{CER} + \varepsilon_{sit}
 \end{aligned}$$

The panel regressions are performed using monthly logarithmic returns of both IFCG indices and individual firms in 12 emerging markets. The data covers 36 months before and 36 months after market liberalization, excluding the 8-month *DurLib* period. $R_{(s)it}$ is the logarithmic return for country i (for asset s in country i) at time t . PostLib_{it} is a dummy variable that takes on the value one in each of the 36 *PostLib* months in country i . $\alpha_{(s)i}$ measures the average monthly return for country i (for firm s in country i) before market liberalization and γ measures the average monthly abnormal return after liberalization across all the countries. $WRet_t$ is the logarithmic World market return (MSCI World Index). Four dummy variables are used to control for the effect of the concurrent economic reforms (CER): Stabilization, Trade, Privatization and the easing of exchange control. Four macroeconomic fundamentals are also used: domestic industrial production, domestic inflation rate, 3 month US T-bill rate, and real exchange rate. $WRank(size_{si})$ is a worldwide rank measure in firm size $\{=(\text{firm's rank in the World}/\text{total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market i $\{=(\text{firm's rank in the country}/\text{total number of firms in that market})\}$. The change in performance for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	0.0093 (1.87)	0.0079 (4.86)	0.0206 (5.00)	0.0210 (4.93)
δ			-0.0215 (-3.65)	-0.0215 (-3.57)
λ	0.4688 (6.06)	0.4515 (24.57)	0.4498 (24.46)	0.4512 (24.56)
Stabilization	-0.0197 (-0.90)	0.0002 (0.00)	0.0005 (0.14)	-0.0003 (-0.07)
Trade	0.0076 (0.56)	-0.0027 (-0.66)	-0.0032 (-0.78)	-0.0027 (-0.65)
Privatization	0.0355 (1.22)	0.0131 (2.05)	0.0121 (1.89)	0.0132 (2.06)
Exchange rate	-0.0179 (-0.80)	-0.0228 (-3.89)	-0.0220 (-3.76)	-0.0224 (-3.83)
No of obs.	795	17810	17810	17810

Table 7: Changes in Volatility

$$M1 \text{ (IFCG indices): } V_{it} = \alpha_i + \gamma PostLib_{it} + [\lambda WVol_t] + \varepsilon_{it}$$

$$M2 \text{ (Individual Firms): } V_{sit} = \alpha_{si} + \gamma PostLib_{it} + [\lambda WVol_t] + \varepsilon_{sit}$$

$$M3 \text{ (World Rank in Size): } V_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta (WRank(size_{si}) * PostLib_{it}) + [\lambda WVol_t] + \varepsilon_{sit}$$

$$M4 \text{ (Domestic Rank in Size): } V_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta (DRank(size_{si}) * PostLib_{it}) + [\lambda WVol_t] + \varepsilon_{sit}$$

The panel regressions are performed using the log of annually realized volatility (standard deviation) of both IFCG indices and individual firms in 12 emerging markets. The data covers 24 months before and 24 months after market liberalization, excluding the 8-month *DurLib* period. $V_{(s)it}$ is the log of realized volatility for country i (for asset s in country i) at time t . $PostLib_{it}$ is a dummy variable that takes on the value one in each of the 24 *PostLib* months in country i . $\alpha_{(s)i}$ measures the average yearly volatility for country i (for firm s in country i) before market liberalization and γ measures the average change in the volatility after liberalization across all the countries for IFCG indices and across all the firms for individual firms data. $WVol_t$ is the log of realized volatility of World market return (MSCI World index) that is used to control for world market volatility. $WRank(size_{si})$ is a worldwide rank measure in firm size $\{=(\text{firm's rank}/\text{total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market $i \{=(\text{firm's rank}/\text{total number of firms in each market})\}$. The changes in the volatility for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>Before Controlling for World Market Volatility</i>				<i>After Controlling for World Market Volatility</i>			
	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	0.3521 (8.85)	0.1334 (29.96)	0.2235 (22.31)	0.0833 (9.50)	0.2621 (4.86)	0.0477 (5.77)	0.0949 (8.79)	0.0671 (5.30)
δ			-0.1397 (-6.34)	0.0946 (6.57)			-0.0880 (-3.74)	-0.0333 (-1.88)
λ					0.3522 (3.65)	0.2700 (33.11)	0.2917 (32.22)	0.2722 (32.38)
No of cross sections	12	305	305	305	12	305	305	305
No of observations	46	1096	1096	1096	46	1096	1096	1096

**Table 8 : Changes in Volatility
after Controlling for Macroeconomic Fundamentals**

$$\begin{aligned}
 M1 \text{ (IFCG indices): } & V_{it} = \alpha_i + \gamma \text{PostLib}_{it} + [\lambda \text{WVol}_i] + \Gamma \text{MF} + \varepsilon_{it} \\
 M2 \text{ (Individual Firms): } & V_{sit} = \alpha_{si} + \gamma \text{PostLib}_{it} + [\lambda \text{WVol}_i] + \Gamma \text{MF} + \varepsilon_{sit} \\
 M3 \text{ (World Rank in Size): } & V_{sit} = \alpha_{si} + \gamma \text{PostLib}_{it} + \delta (\text{WRank}(\text{size}_{si}) * \text{PostLib}_{it}) + [\lambda \text{WVol}_i] + \Gamma \text{MF} + \varepsilon_{sit} \\
 M4 \text{ (Domestic Rank in Size): } & V_{sit} = \alpha_{si} + \gamma \text{PostLib}_{it} + \delta (\text{DRank}(\text{size}_{si}) * \text{PostLib}_{it}) + [\lambda \text{WVol}_i] + \Gamma \text{MF} + \varepsilon_{sit}
 \end{aligned}$$

The panel regressions are performed using the log of annually realized volatility (standard deviation) of both IFCG indices and individual firms in 12 emerging markets. The data covers 24 months before and 24 months after market liberalization, excluding the 8-month *DurLib* period. V_{sit} is the log of realized volatility for country i (for asset s in country i) at time t . PostLib_{it} is a dummy variable that takes on the value one in each of the 24 *PostLib* months in country i . $\alpha_{(s)i}$ measures the average yearly volatility for country i (for firm s in country i) before market liberalization and γ measures the average change in the volatility after liberalization across all the countries for IFCG indices and across all the firms for individual firms data. Four macroeconomic fundamentals are also used: domestic industrial production, domestic inflation rate, 3 month US T-bill rate, and real exchange rate. WVol_i is the log of realized volatility of World market return (MSCI World index) that is used to control for world market volatility. $\text{WRank}(\text{size}_{si})$ is a worldwide rank measure in firm size $\{= (\text{firm's rank}/\text{total number of firms in 12 markets})\}$. $\text{DRank}(\text{size}_{si})$ is a firm's rank in the local market i $\{= (\text{firm's rank}/\text{total number of firms in each market})\}$. The changes in the volatility for M3 and M4 are measured by $\gamma + \delta \text{WRank}(\text{size}_{si})$ in the case of World rank size measure, and $\gamma + \delta \text{DRank}(\text{size}_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	-0.1255 (-1.59)	-0.1443 (-14.77)	-0.0922 (-6.05)	-0.1320 (-8.26)
δ			-0.0957 (-4.49)	-0.2128 (-0.91)
λ	0.7244 (5.50)	0.2395 (29.11)	0.2417 (27.59)	0.2399 (28.49)
Industrial Production	-0.5015 (-1.41)	0.2576 (8.56)	0.2563 (7.99)	0.2586 (8.39)
US T-bill rate	-0.2706 (-1.30)	-0.0638 (-4.87)	-0.0496 (-3.83)	-0.0601 (-4.55)
Domestic Inflation	0.3824 (4.64)	0.4014 (50.81)	0.3983 (49.58)	0.4004 (50.17)
Real Foreign Exchange	-0.3710 (-3.70)	-0.2519 (-24.23)	-0.2454 (-23.54)	-0.2498 (-23.92)
No of obs.	35	972	972	972

Table 9: Changes in the Correlation Coefficient with World Market Return

$$M1 \text{ (IFCG indices): } CR_{it} = \alpha_i + \gamma PostLib_{it} + [\lambda WVol_t] + \varepsilon_{it}$$

$$M2 \text{ (Individual Firms): } CR_{sit} = \alpha_{si} + \gamma PostLib_{it} + [\lambda WVol_t] + \varepsilon_{sit}$$

$$M3 \text{ (World Rank in Size): } CR_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta(WRank(size_{si}) * PostLib_{it}) + [\lambda WVol_t] + \varepsilon_{sit}$$

$$M4 \text{ (Domestic Rank in Size): } CR_{sit} = \alpha_{si} + \gamma PostLib_{it} + \delta(DRank(size_{si}) * PostLib_{it}) + [\lambda WVol_t] + \varepsilon_{sit}$$

The panel regressions are performed using the annually realized correlation coefficient of both IFCG indices and individual firms in 12 emerging markets. The data covers 24 months before and 24 months after market liberalization, excluding the 8-month *DurLib* period. $CR_{(s)it}$ is the correlation coefficient with World market (MSCI World index) return for country i (for asset s in country i) at time t . $PostLib_{it}$ is a dummy variable that takes on the value one in each of the 24 *PostLib* months in country i . $\alpha_{(s)i}$ measures the average yearly correlation with World market return for country i (for firm s in country i) before market liberalization and γ measures the average change in the correlation after liberalization across all the countries for IFCG indices and across all the firms for individual firms data. $WVol_t$ is the realized volatility of World market return (MSCI World index) that is used to control for World market volatility. $WRank(size_{si})$ is a worldwide rank measure in firm size $\{=(\text{firm's rank}/\text{total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market $i \{=(\text{firm's rank}/\text{total number of firms in each market})\}$. The change in the correlation coefficient for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>Before Controlling for World Market Volatility</i>				<i>After Controlling for World Market Volatility</i>			
	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	0.0157 (0.37)	0.0605 (9.40)	-0.0141 (-0.97)	0.0652 (4.40)	0.0039 (0.08)	-0.0223 (-3.62)	-0.1058 (-8.81)	-0.0120 (-0.86)
δ			0.1524 (5.68)	-0.0094 (-0.31)			0.1647 (7.33)	-0.0191 (-0.82)
λ					1.3001 (2.18)	2.2129 (35.54)	2.2361 (36.06)	2.2121 (35.50)
No of cross sections	12	305	305	305	12	305	305	305
No of observations	46	1096	1096	1096	46	1096	1096	1096

Table 10 : Changes in the Correlation Coefficient with World Market Return after Controlling for Macroeconomic Fundamentals

$$\begin{aligned}
 M1 \text{ (IFCG indices): } CR_{it} &= \alpha_i + \gamma PostLib_{it} + [\lambda WVVol_t] + \Gamma MF + \varepsilon_{it} \\
 M2 \text{ (Individual Firms): } CR_{sit} &= \alpha_{si} + \gamma PostLib_{it} + [\lambda WVVol_t] + \Gamma MF + \varepsilon_{sit} \\
 M3 \text{ (World Rank in Size): } CR_{sit} &= \alpha_{si} + \gamma PostLib_{it} + \delta(WRank(size_{si}) * PostLib_{it}) + [\lambda WVVol_t] + \Gamma MF + \varepsilon_{sit} \\
 M4 \text{ (Domestic Rank in Size): } CR_{sit} &= \alpha_{si} + \gamma PostLib_{it} + \delta(DRank(size_{si}) * PostLib_{it}) + [\lambda WVVol_t] + \Gamma MF + \varepsilon_{sit}
 \end{aligned}$$

The panel regressions are performed using the annually realized correlation coefficient of both IFCG indices and individual firms in 12 emerging markets. The data covers 24 months before and 24 months after market liberalization, excluding the 8-month *DurLib* period. $CR_{(s)it}$ is the correlation coefficient with World market (MSCI World index) return for country i (for asset s in country i) at time t . $PostLib_{it}$ is a dummy variable that takes on the value one in each of the 24 *PostLib* months in country i . $\alpha_{(s)i}$ measures the average yearly correlation with World market return for country i (for firm s in country i) before market liberalization and γ measures the average change in the correlation after liberalization across all the countries for IFCG indices and across all the firms for individual firms data. Four macroeconomic fundamentals are also used: domestic industrial production, domestic inflation rate, 3 month US T-bill rate, and real exchange rate. $WVol_t$ is the realized volatility of World market return (MSCI World index) that is used to control for World market volatility. $WRank(size_{si})$ is a worldwide rank measure in firm size $\{= (\text{firm's rank}/\text{total number of firms in 12 markets})\}$. $DRank(size_{si})$ is a firm's rank in the local market i $\{= (\text{firm's rank}/\text{total number of firms in each market})\}$. The change in the correlation coefficient for M3 and M4 are measured by $\gamma + \delta WRank(size_{si})$ in the case of World rank size measure, and $\gamma + \delta DRank(size_{si})$ in the case of domestic rank size measure. t-statistics based on heteroskedasticity-consistent (White) standard errors are reported in parentheses.

	<i>IFCG Indices</i>	<i>Firm: Average</i>	<i>Firm: World Rank</i>	<i>Firm: Domestic Rank</i>
γ	-0.0813 (-1.13)	-0.0466 (-7.68)	-0.1059 (-7.42)	-0.0895 (-6.76)
δ			0.1035 (4.41)	0.0731 (3.35)
λ	0.1875 (2.38)	1.9769 (73.19)	1.9702 (73.01)	1.9675 (73.48)
Industrial Production	-0.4508 (-1.55)	-0.2081 (-4.74)	-0.2250 (-5.03)	-0.2177 (-4.92)
US T-bill rate	-0.8661 (-8.69)	-0.0614 (-7.88)	-0.0665 (-7.73)	-0.0638 (-8.13)
Domestic Inflation	0.0171 (0.16)	0.0022 (0.26)	0.0086 (0.96)	0.0040 (0.47)
Real Foreign Exchange	-0.0777 (-0.62)	-0.0267 (-3.27)	-0.0261 (-3.09)	-0.0257 (-3.13)
No of obs	35	972	972	972