The Asian Bet*

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INTRODUCTION

The recent financial crisis in Asia has dramatically changed the world's perception of this region. Asian economies have gone from "miraculous" to "problematic". As the wealth and relative incomes of these economies have diminished, many observers have concluded that international and Asian capital markets have failed.

How else can we justify the violent swings observed in Asian equity prices and exchange rates? If a well functioning capital market serves to allocate scarce capital efficiently from lenders to users, then the exodus of international private capital from Asia may be interpreted as the failure of international capital markets to expedite the flow of funds from lenders to borrowers. However, the sudden withdrawal of funds from Asia need not be interpreted as a signal of financial market failure. Moreover, if the risk of investing in Asian markets has increased dramatically, capital flight by risk averse investors is exactly what one would expect as portfolios are rebalanced.

Participants in international capital markets and local Asian capital markets were also accused of ignoring risks inherent in investments in the region. The critics argue that market participants ignored the deteriorating fundamentals of Asia's corporate sector and thus failed to take into account the growing risk of the region. They interpret the sudden collapse in equity prices following the devaluation of the Thai Baht in July 1997 as the bursting of Asia's asset price bubble. It is also possible to make the case that investors reacted rationally to a critical piece of new information. In effect, market discipline reasserted itself.

In this paper we assess the claim that capital markets failed to perform their primary duties during the 1990s. Our assessment is grounded in a quantitative and qualitative analysis of local Asian capital markets and the interaction of Asian corporations with international capital markets. Where possible we compare the capital market performance and corporate performance within East Asia to that of Latin America.

Our results indicate that a significant proportion of the growth in market capitalization of Asian markets during the 1990s resulted from the mobilization of new capital. Asian capital markets and international capital markets provided the funds required to sustain the high investment rates that characterized the region. Furthermore, Asian capital markets provided investors with the liquidity commonly associated with developed capital markets.

During the 1990s, Asian capital markets also attempted to integrate themselves further into international capital markets. Financial market integration is arguably the most challenging issue that emerging markets face as they evolve into developed capital markets. We find that Asian governments pursued similar policies of gradual capital market reform including capital market liberalization during the 1990s. As a result of this process, foreign investors were able to participate directly in local equity markets. We show that foreign investors had a negligible impact on local stock market returns and volatility.

Despite their significant growth, new capital mobilization, and attempts at financial market liberalization, Asian stock markets remained heavily concentrated in terms of market capitalization of individual firms and industry base. Financial firms and manufacturing firms dominated market indexes accounting for a minimum of 60% of each index's market capitalization.[1] This lack of industrial diversification made Asian equity markets vulnerable to common industry based shocks. Moreover, the high degree of concentration in terms of the market capitalization of individual firms

[1] The only exception being Malaysia.

contributed to a lack of cross sectional variation in returns across firms in any given country. In general, individual corporations listed on Asian exchanges tended to move together to a much larger extent than would be expected in more diversified countries.

We argue that the overall returns of equity investments in Asia were not impressive relative to alternative investments in various other markets. Even dynamic trading strategies designed to capture price appreciation in these recently integrated markets failed to reward investors with returns that outperformed less risky investments. This analysis does not include the significant decline in share prices between January 1997 and the present.

We provide a micro-level analysis of participants in Asian financial markets by systematically evaluating the performance and financial risk of Asian corporations. We find that Asian corporate managers increasingly leveraged their companies despite their declining profitability. We also examine the characteristics of the debt. Here we study the cross sectional characteristics of Eurobonds issued by Asian corporations. We find evidence suggesting that the typical Asian non-financial corporation that issued foreign denominated debt experienced higher profitability than the average Asian firm. However, the typical Asian Eurobond issuer was much more highly leveraged than the average Asian non-financial corporation.

We refer to the higher leverage at a time of declining profitability, as a "bet." The stakes were raised by managers tapping into foreign debt markets in an effort to bet that the exchange rate would remain stable. History proves that they lost both of these bets. We argue that the Asian crisis was greatly exacerbated by these bets. We also argue that corporate governance failed to control and manage risk.

The paper is organized as follows. The first section sets the stage and tone for our discussion. We summarize some of the more pertinent findings of the burgeoning literature on the Asian financial crisis, and we highlight key issues that have yet to be resolved. The second section documents the growth in Asian capital markets and attempts to determine how much of this growth constituted new capital mobilization. The third section summarizes Asia's attempts to integrate its local capital markets into world capital markets and the impact of this integration on Asian capital markets. The fourth section examines the degree of concentration in Asian equity markets. The fifth section records the performance of investments in the region. The sixth section details the performance of Asian corporations and presents an analysis of the increasing financial risk of corporations in the region. The seventh section explores common cross sectional characteristics of Asian Eurobond issuers and offers an overview of forthcoming research. The final section offers some concluding remarks.

I. STYLIZED FACTS DESCRIBING EAST ASIAN COUNTRIES

Consider the following set of stylized facts that describe the Asian economic and financial experience in the 1990s. During most of the past two decades, Asia enjoyed consistently high economic growth, implemented gradual financial market liberalization, and maintained effectively pegged nominal exchange rates. These three forces encouraged high levels of private capital inflows that in turn supported increasing levels of investment. Although most of these private capital inflows resulted from long term foreign direct investment, a non-trivial amount was portfolio inflows.

East Asia's large inflows of private capital brought about the appreciation of real exchange rates. This appreciation eventually affected the competitiveness of Asian exports. Export growth slowed in most countries and profit margins tightened. Towards the end of the 1990s indicators of corporate performance worsened as investment returns failed to achieve the cost of capital in some cases.[2] Eventually, firms experienced cash flow shortages and were forced to reconsider their debt servicing obligations. Following the defaults on foreign loans by several Korean chaebols in early 1997, international investors refocused their attention on the region's fundamentals.

The speculative pressure placed on the Thai Baht and its subsequent devaluation in July 1997 served as an announcement that investors had re-evaluated the growth prospects of Asian corporations and decided that the expectations of the past needed to be revised given the current conditions. The subsequent exodus of private foreign capital and attempts by monetary officials to restrain this capital flight placed Asia in a liquidity crisis of unprecedented size. Firms were unable to receive the funding they needed to service existing debts and in some cases to maintain operations and fill pre-existing orders.[3]

Many authors blame the international financial community. Some researchers have gone so far as to argue that the crisis could have been avoided if the financial community had not over-reacted. Radelet and Sachs champion this view: "While there were significant underlying problems and weak fundamentals besetting the Asian economies . . . the imbalances were not severe enough to warrant a financial crisis of the magnitude that took place in the latter half of 1997. . . The worst of the crisis could have been largely avoided with relatively moderate adjustments and appropriate policy changes" by the international community.[4]

Radelet and Sachs' condemnation of the international financial system is unequivocal. They argue that market participants ignored flaws in these economies and discounted the possibility of a regional crisis. These two criticisms suggest market failure. They also argue that these economies were prone to financial panic due to the lack of a lender of last resort and weak bankruptcy laws. They contend that individual investors fled the region leaving viable investment opportunities behind and thus failed to expedite scarce capital from borrowers to lenders. This kind of investor herd mentality underestimates the rationality of investors. It is not clear that investors left valuable investments on the table in an attempt to withdraw their funds from the region. Provided that the risks of investment in the region had changed dramatically, it seems likely that investors should rationally rebalance their portfolios.

Another school of thought criticizes international financial investors for their lack of discipline prior to the financial crisis. Krugman and Corsetti, Pesenti, and Roubini assert that international investors

[2] Corsetti, Giancarlo, Paolo Pesenti, and Nouriel Roubini. "Paper Tigers? A Model of the Asian Crisis," Working Paper, 1998.
[3] *Ibid.*
[4] *Ibid.*

placed too much emphasis on government guarantees. Implicit and explicit government subsidization of private investment created large incentives for moral hazard. Excessive lending by local institutions in risky investment projects led to asset price inflation that in turn attracted foreign capital inflows. Corsetti, Pesenti, and Roubini summarize this vicious cycle, "the Asian tigers collapsed under the excessive weight of the paper liabilities which had financed projects of doubtful profitability, covered losses, and led to unsustainable external imbalances."[5]

Krugman argues that these financial intermediaries were not solely responsible for the ills of Asia's asset price bubble. "After all, private individuals and foreign institutional investors did buy stocks and even real estate in all the economies now in crisis. This suggests other kinds of market failure, notably "herding" by investors."[6]

Placing the blame for the crisis squarely on the shoulders of the financial community may be warranted. It appears on the surface as though most financial market participants largely ignored the possibility of a regional crisis. Examples of this ignorance are presented in Cline and Barnes, Radelet and Sachs, and Corsetti, Pesenti, and Roubini. These authors present evidence of declining bond spreads, high sovereign credit ratings, and optimistic risk assessments by private corporations like Euromoney.

Some of this ignorance was to be expected given that the traditional signs of a currency crisis were not present in East Asia. By and large, East Asian governments followed strict fiscal discipline. They actively pursued policies of outward oriented trade and financial market liberalization. Finally, the levels of government official debt did not appear to be unsustainable. In light of these revelations, financial markets, and in particular, foreign investors, are easy scapegoats. However, there are other possible reasons for the regional collapse.

Although we have learned much from the research, the arguments rely on highly aggregated evidence. If we are to believe their assertions of capital market failure, we must believe either that self-interested investors withdrew their support from viable economic investments or that moral hazard provided risk taking incentives for local Asian corporate managers that foreign investors willingly ignored.

Unfortunately, this literature only alludes to the financial market's failure ex-post. Ideally we would like systematically to identify the sources of risk ex-ante and verify whether or not financial markets correctly accounted for these risk factors. Moreover, we would like to be able to describe the financial market's relative discipline at the country level vis-à-vis each country's exposures to common sources of risk. This sort of approach must be based on a micro level, firm by firm analysis.

Recently, several authors have attempted this sort of analysis. Pomerleano analyzes the performance of corporations across the region during the 1990s. He employs firm level data to construct indexes of corporate performance based on common accounting concepts like sales growth, profit margins, and real return on assets. He provides evidence that corporations sustained high investment rates through increased external financing. The study by Claessens, Djankov, and Lang is similar in spirit. It documents significant declines in corporate profitability ratios as well as increases in average corporate leverage ratios. In combination, both works provide new evidence suggesting that the causes of the Asian crisis may reside in firm based decisions. These corporate level decisions apparently placed the region in a very risky position.

[5] Corsetti, Giancarlo, Paolo Pesenti, and Nouriel Roubini. "Paper tigers? A model of the Asian crisis," New York University Working Paper, 1998, page 29.
[6] Krugman, Paul. "What Happened to Asia?" Unpublished Manuscript, 1998.

Our paper explores a new micro level analysis. First, we identify common sources of risk in terms of corporate performance, capital structure, and financial risk. This commonality helps to explain the high correlation between asset returns and corporate performance in East Asia. Second, we augment the analysis of Pomerleano and of Claessens, Djankov, and Lang by examining an additional common source of risk facing corporations, currency risk. We argue that deteriorating profit margins and high leverage ratios alone may not account for the magnitude of the crisis. Rather, the major factor contributing to the Asian crisis was the growing amount of US dollar denominated debt accruing to Asian corporations.

II. NEW CAPITAL MOBILIZATION IN EAST ASIA

East Asian capital markets experienced dramatic changes during the 1990s. Throughout the region, local equity and bond markets increased their market capitalization. In this section, we provide a quantitative review of the new capital mobilization within Asia during the 1990s. We also present evidence suggesting that the liquidity offered to investors in Asia rivaled that of any developed market in the world. In fact, in some cases Asian markets led the world in total value traded.

In addition to raising large amounts of new capital in their local capital markets, the region also tapped into international equity and bond markets. We examine two major sources of external finance available to Asian corporations, international equity offerings or depository receipts and international bond placements. Where possible, we comment on the extent to which Asia relied on internal versus external sources of funds.

II.A New Capital Mobilization within Domestic Markets

According to the International Finance Corporation's *Emerging Stock Market's Factbook 1998*, the total US dollar market capitalization across the major Asian stock market exchanges in China, Indonesia, Korea, the Philippines, Malaysia, Taiwan (China), and Thailand increased more than threefold from roughly $297 billion to $1.105 trillion between 1990 and 1996. Much of the growth in market capitalization in the region can be attributed to the outstanding growth on the Shanghai Stock Exchange and the Shenzhen Stock Exchange in China. Between 1991 and 1996 the combined US dollar market capitalization of these two exchanges increased by a factor of 55. In fact, China's stock market growth was the largest of any emerging market. Only 4 other countries managed this caliber of quadruple digit growth rates, all of which were emerging stock markets.[7] If we exclude China from our calculation, Asian stock markets doubled in size between 1990 and 1996. Although this figure seems impressive it is substantially lower than the threefold increase mentioned previously.

Within each of the Asian countries we find a similar story for the growth in market capitalization of the local stock markets. Stock exchanges in Indonesia, Malaysia, the Philippines, Taiwan, and Thailand increased their market capitalization by factors of 10, 5, 12, 2, and 3 respectively. Korea was the only East Asian country that failed to double its stock market capitalization during the period. In fact, the Korean Stock Exchange recorded a gain in market capitalization of little more than 25% between 1990 and 1996. With the exception of Taiwan and Korea, the growth of market capitalization of Asian stock markets exceeded the 270% growth rate that emerging markets as a group posted during the same period. Moreover, all Asian stock markets with the exception of Korea experienced growth rates of market capitalization in excess of the 170% increase in market capitalization posted by US stock markets between 1990 and 1996. Overall, local Asian stock markets increased their market capitalization at a faster pace than most developed markets.

The growth rates of market capitalization that characterized the region allowed East Asian stock exchanges to remain the largest emerging stock markets in the world. As a region, the combined market capitalization of Asian equity markets accounted for 48 percent of the stock market capitalization in emerging markets in 1990. Asian equity markets maintained this market share up until 1996. As of 1990 Asian stock markets were roughly four times as large as the combined stock markets in Latin America. In fact, the market capitalization of both the Korean Stock Exchange and the Taiwan Stock Exchange were larger than the entire market capitalization across all Latin American stock exchanges in 1990.

[7] Argentina, Brazil, Malaysia, and the Philippines.

However, Latin American stock markets grew much faster than stock markets in Asia. By 1996 the total stock market capitalization of Latin American stood at $444 billion and was more than five times as large as its level in 1990. As a result of their rapid growth, Latin American stock markets made progress in closing the size gap in market capitalization between the two regions. As of the end of 1996 Asian stock markets as a group were only twice as large as their Latin American counterpart. Were Latin American stock markets more efficient at rolling out new market capitalization or were the phenomenal growth rates in market capitalization driven by share price appreciation?

Although these growth rates may seem impressive, they do not necessarily indicate the mobilization of new equity within these local stock markets. The total market capitalization of any individual stock exchange may increase as a result of either share price appreciation or new capital mobilization. To identify how much of the growth in Asia's market capitalization resulted from new capital mobilization we examine the number of companies listed on each of the exchanges in Asia and the value of new shares issued by existing firms. We interpret an increase in the number of companies listed on each exchange as a proxy for the number of initial public offerings (IPOs) within the country.

The total number of listed companies on the exchanges in China, Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand increased from 1,642 to 3,766. The addition of more than 2,100 listed companies constituted a significant amount of new capital mobilization. Moreover, this figure may be a conservative estimate of the IPOs given that some new companies were listed and subsequently de-listed between 1990 and 1996. Nevertheless, the number of IPOs introduced on Asian exchanges made up almost one third of all IPOs in emerging markets.

The growth in the number of firms listed on Asian stock exchanges was influenced to a large extent by the introduction of the Shanghai Stock Exchange in December of 1990. Between the 1991 and 1996 at least 540 firms successfully issued initial public equity offerings on the Shanghai and Shenzhen exchanges. In fact, the new equity offerings in China accounted for roughly a quarter of the new equity offerings throughout Asia.

Notwithstanding China's tremendous success, the other stock exchanges in Asia also added new firms during the 1990s. For example, the Kuala Lumpur Stock Exchange in Malaysia listed at least 339 new firms between 1990 and 1996. Indonesia, Korea, the Philippines, Taiwan and Thailand also managed to incorporate new companies on their local exchanges. Each of the local equity markets in these countries listed 128, 91, 62, 240, and 183 new firms respectively over the same period.

In contrast, only 108 IPOs found their way onto the Latin American exchanges between 1990 and 1996. In fact, the Santiago Stock Exchange and the Bolsa de Valores in Caracas were the only exchanges in Latin America that listed more firms on their exchanges in 1996 than in 1990. All other exchanges in the region experienced a decline in the number of firms listed during the same period. While 108 new firms began trading on organized exchanges in Latin America between 1990 and 1996 not all of these firms survived. In fact the total number of firms listed across all Latin American exchanges increased by 11 between 1990 and 1996. In light of this evidence, we can safely conclude that the increase in market capitalization on the Latin American stock exchanges resulted primarily from share price appreciation. Asian exchanges, in contrast, increased their market capitalization in large part by floating new equity offerings.

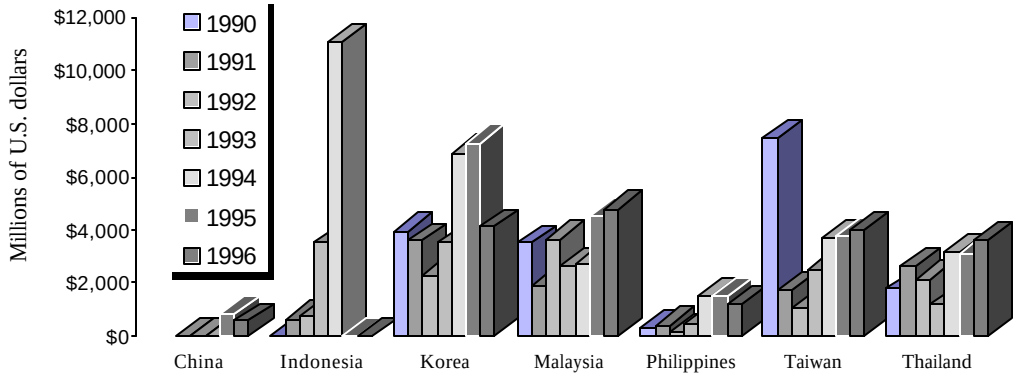
Unfortunately, the IFC (International Finance Corporation) data do not allow us to study the size of the IPOs. However, we can study seasoned equity offerings for the subset of firms that make up the IFCs emerging market indexes using the Emerging Markets Database. Although these indexes do not provide comprehensive coverage of a country's entire stock market, the firms selected encompass at least 60 percent of the market capitalization of the entire stock market at any given

point in time. We must bear in mind, however, that the figures provided by the IFC on new share issuance serve as a conservative estimate of the total amount of new equity floated within the domestic stock market in any given year. In the section to follow we use seasoned equity offerings and new share offerings interchangeably.

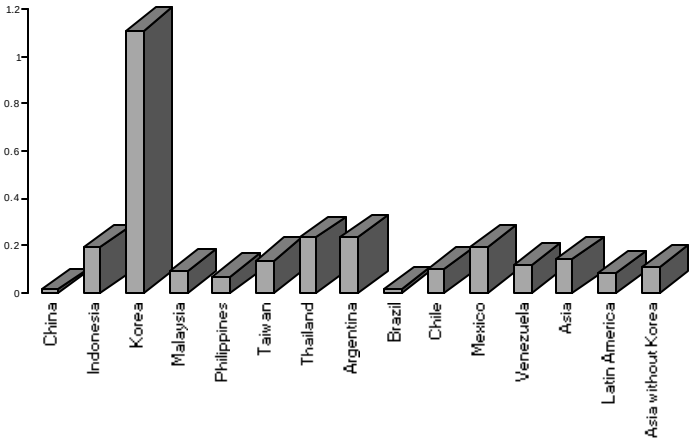
The total US dollar value of public share issuance for IFC constituent firms is presented in Panel A of Figure 1. Over two thirds of the total value of new share issuance in China, Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand resulted from the issuance record of just three countries; Korea, Malaysia, and Taiwan. In fact Korea alone accounted for just over one quarter of the total value of new shares issued by these countries between 1990 and 1996. We should expect the total value of shares issued in Korea, Malaysia, and Taiwan to exceed other countries in the region given that these markets are extremely large relative to the rest of the region.

Figure 1: Equity Issuance in East Asian Stock Markets

Panel A: Total MCAP of New Equity Issuance



Panel B: New Equity Issuance as Percent of Change in Total Market Capitalization



In order to get a better sense of which markets issued the most shares relative to their size, we examine the ratio of total value of new shares to market capitalization. Between 1990 and 1996, the total value of new shares issued in Korea, Malaysia, and Taiwan averaged 3% of the existing market capitalization of these countries. The ratio of the total value of new shares to market capitalization in Thailand, on the other hand, averaged 3.9% during the same period. In Indonesia, this average was 7%. Based upon the subset of firms available in the IFC EMDB, it appears that equity markets in Indonesia and Thailand were more aggressive in issuing seasoned offerings relative to the larger markets in East Asia.

Compared to Latin America, we find that Asia issued more than three times as much seasoned equity over the period. The total value of seasoned equity offerings by IFC constituents in Asia between 1990 and 1996 was roughly $120 billion dollars while in Latin American the total issuance amounted to just over $32 billion. Of course, we documented previously the fact that Asian equity markets are almost 4 times as large as the equity markets in Latin America. Thus we should expect that within Asia new equity issues could be absorbed more easily into the relatively deeper equity markets. However, controlling for the size of these markets we find that Asian equity markets dominated Latin America not only in the total amount of new equity issuance, but also in the ratio of total value of new equity issuance to market capitalization. In Latin America, the ratio of total value of new equity to market capitalization averages 1.41% between 1990 and 1996. In Asia, on the other hand, the ratio averaged 2.89% during the same period.

We can also use the data from the IFC's EMDB to help decompose the growth in market capitalization into appreciation and new capital mobilization. In order to examine these two effects, we form the ratio of total value of shares issued to the total change in market capitalization. Panel B of Figure 1 presents the cross section of this statistic for various countries in Asia and Latin America. For the Asian countries presented in this figure, new share issuance accounts for 15% of the change in market capitalization of the region between 1990 and 1996.

In Korea, the total value of new share issuance between 1990 and 1996 exceeded the total change in market capitalization. During this same period the Korean IFC price index lost 50% of its value in US dollar terms. This dramatic share price decline reduces the overall market capitalization and thus the ratio reported in Figure 1 is greater than one. Leaving out Korea from our average ratio across Asia, we find that seasoned equity offerings by IFC constituents accounted for 11% of the total change in market capitalization between 1990 and 1996.

Comparing Latin America to Asia we find that within Asia new capital mobilization plays a larger role in explaining the growth in market capitalization. Only 8% of the growth in the market capitalization of Latin American stock markets could be attributed to new capital mobilization. In Asia, depending on which set of countries one chooses to include, we find that new capital mobilization accounted for between 11% and 15% of the growth in market capitalization of the regions equity markets.

Equity offerings on the local stock markets in East Asia were not the only means by which local companies could raise the capital. Certain firms were able to tap into the local bond markets to raise capital. According to the International Federation of Stock Exchanges (FIBV), the total market value of bonds listed on the exchanges in Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand exceeded $105.8 billion dollars in 1992. By the end of 1996 this figure had more than doubled to $208.2 billion dollars. We make no attempt to ascertain how much of this increase in market value resulted from changes in interest rates. Furthermore, we only examine bonds that are listed on the major stock exchanges in each country.

The market value of bonds listed on major exchanges was not evenly distributed among the Asian countries. In fact, the market capitalization of bonds listed on the Korean Stock exchange accounted for roughly three fourths of the total market capitalization of bonds listed on exchanges throughout the region. The Taiwan Stock Exchange had the second largest market capitalization of bonds listed in all of East Asia. Between 1992 and 1996 the market value of bonds listed on the Taiwan exchange increased from $20.8 to $36.7 billion dollars. Combined, bonds listed in Korea and Taiwan accounted for over 95% of the total value of bonds listed on the major East Asian stock exchanges.

The rest of East Asia appears to have developed less mature local bond markets. Excluding Korea, the total value of bonds listed on the local exchanges in East Asia in any given year in the 1990s was less than the amount listed on the Buenos Aires Stock Exchange. In fact, excluding Korea, the total value of bonds listed on the Latin American exchanges averaged roughly twice the value of bonds listed in East Asian throughout the 1990s. So while East Asian equity markets are roughly 4 times the size of those in Latin America, the combined local equity and debt markets in East Asia are only twice the size of those in Latin America.

As a fraction of total liabilities, Asian corporations appear to have relied less heavily on bond financing than on equity financing during the early 1990s compared to other countries. In fact, the ratio of the market capitalization of bonds to equity in Asia was 28% in 1991 whereas in the United States the ratio was 54%. For the sake of additional comparison, the ratio of the market capitalization of bonds to equity was just over 25% in Latin America in 1991. Of course, one major source of financing that is conspicuously missing is the total amount of bank loans to Asian corporations. As such, our relative comparisons across regions consider only the ratio of bond finance to equity finance and not the ratio of debt finance to equity finance.

A closer examination reveals that Korea's extensive use of bond financing throughout the 1990s drove up the ratio of bond market capitalization to equity market capitalization for the region as a whole. In fact, Korea's average ratio of total market capitalization of bonds to total market capitalization of equity was roughly 90% between 1990 and 1996. At the end of 1996, Korean equity was highly leveraged with domestic bond issues alone! Excluding Korea from our calculation of the ratio of market capitalization of bonds to equity in Asia drops from 28% to 8%. Thus, the ratio for Asia, excluding Korea was roughly one third of that for Latin America and one fifth of that of the United States.

Comparing Asian bond markets to their Latin American counterparts, we find that, in general, the total market value of Latin American bonds was more evenly distributed across the region. Argentine bonds listed in Buenos Aires commanded the greatest share of the total market value of bonds listed on Latin exchanges. Between 1992 and 1996, the market value of Argentine bonds made up roughly 50% of the entire market value of Latin bonds. Interestingly enough, Mexican debt originally accounted for 55% of the Latin total in 1992. However, between 1992 and 1994 the market value of bonds listed on the Bolsa de Valores in Mexico fell by 50%. During the same period, the market value of bonds listed in Buenos Aires increased by almost 300%. Despite the wide swings in the relative market valuations of bonds across countries, in general, the market capitalization of traded debt was more evenly distributed across Latin American markets than it was in Asia.

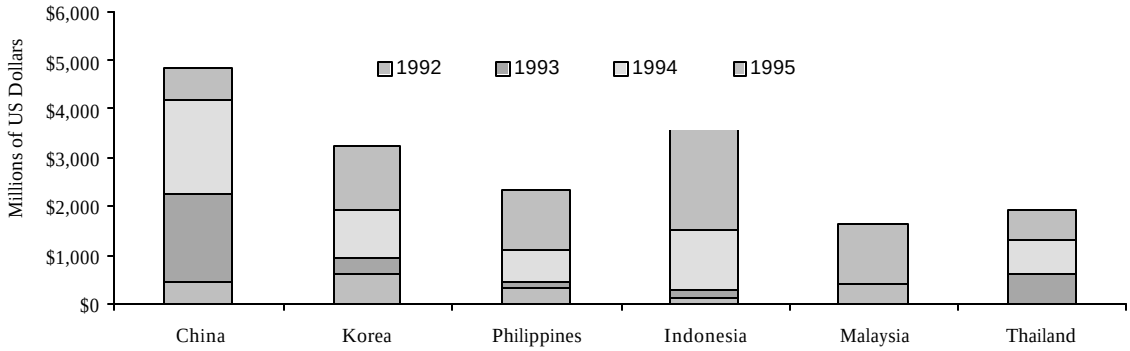
II.B New Capital Mobilization Outside Domestic Markets

While the two previous sections documented the amount of new capital mobilization occurring within local Asian equity and debt markets, the story is incomplete unless we examine Asia's use of external financing. In fact, throughout the 1990s, Asian corporations were extremely successful at raising capital in international equity and debt markets.

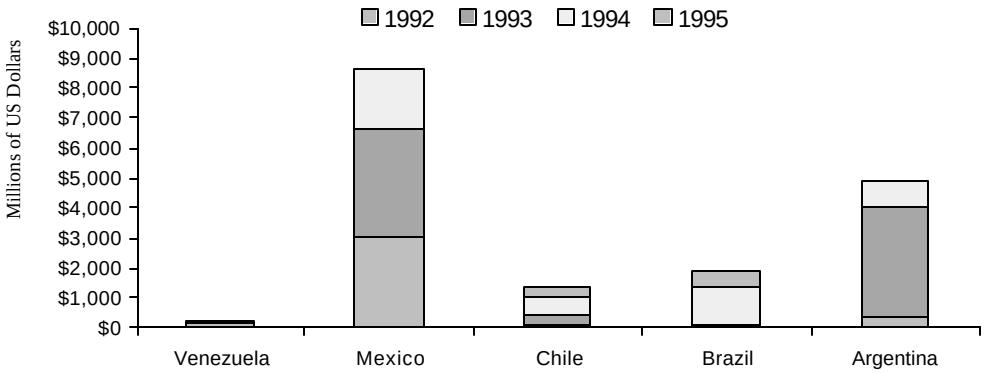
Throughout the 1990s, Asian corporations made extensive use of international equity markets to raise capital. Figure 2 provides a snap shot of the amount of international equity floated by East Asian countries during the early 1990s. Between 1992 and 1995 China, Indonesia, Korea, Malaysia, the Philippines, and Thailand raised over $17.7 billion dollars in equity in international capital markets. Over the same period, the IFCs EMBD reported a total share issuance by IFC constituents of $62.7 billion dollars. For every $3 dollars raised in local equity markets, Asian firms raised approximately $1 dollar in international equity markets.

Figure 2: International Equity Offerings 1992-1995

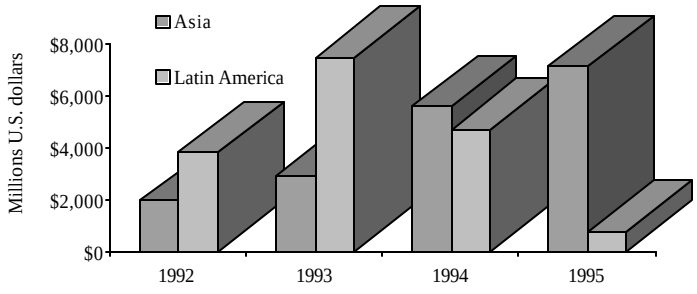
Panel A: East Asia



Panel B: Latin America



Panel C: Regional Totals



Source: World Bank

The pace of international equity issuance by Asian countries increased throughout the 1990s. In 1992, 25 Asian firms raised a total of $1.9 billion dollars in international equity markets. By 1995, the number of firms issuing international equity had increased to 70 and the total amount issued rose to $7.2 billion. Moreover, the average amount each firm issued increased throughout the 1990s. In 1992, Asian firms raised $76 million dollars in each international equity issue. By 1995, this figure increased to $104 million. Asian equity appeared to be received well by international investors.

The issuance record varies across Asian countries. Chinese firms were the most successful at raising funds in international equity markets. Between 1992 and 1995, 76 separate international equity issues by Chinese firms totaled $4.9 billion dollars. In fact, over one quarter of the total international equity issued in Asia came from Chinese equity issues. During the same period, only 25 Indonesian equity placements were recorded in the international markets. Nevertheless, over $3.6 billion dollars of Indonesia equity found its way into the international market. Korean firms were also successful in their placements in international equity markets. Overall, 43 placements were made between 1992 and 1995 bringing in a total of $3.2 billion dollars. Malaysia, on the other hand, had only 7 successful floats between 1992 and 1995. Combined these international equity placements raised a total of just over $1.6 billion dollars, roughly one half the amount raised by Korea.

Comparing the international equity issuance record of Asia to that of Latin America, we find little difference at the aggregate level. Between 1992 and 1995, 209 Asian and 180 Latin American equity placements were made in international equity markets. The total value of international equity placements during the same time period was $17.6 billion for Asian and $16.9 billion for Latin America. The average international equity placement raised $84 million in Asia and $93 million in Latin America. On the surface these two regions appear to have very similar issuance records.

However, at least one subtle but very important distinction should be mentioned. Latin American firms tended to prefer publicly issued international equity to private placements. Of the 180 equity placements made by Latin American countries, 138 were public issues. Roughly three quarters of the international equity issues were sold to the general public. In Asia, on the other hand, only 79 of the 209 international equity placements were public issue. Roughly two thirds of the placements made by Asian companies were sold privately.

Unfortunately, the World Bank data does not allow us to distinguish between the various forms of international equity placement used by Asian firms. The Bank of New York's Depository Receipts Database provides more detailed information on the classification of each of Asia's international equity offerings. Depository receipts allowed Asian firms to attract a broader investor base as well as increase their overseas name recognition. These receipts are negotiable certificates that usually represent a company's publicly traded equity or debt. They are created when a broker purchases the company's shares on the home stock market and delivers the shares to the depositary's local custodian bank, which then instructs the depositary bank to issue depositary receipts.

Two common forms of depository receipts are American Depository Receipts (ADR) and Global Depository Receipts (GDR). Both ADRs and GDRs are public issues. They are issued either as a sponsored Level I, i.e. over the counter (OTC), or as a sponsored Level II, which allows the depository receipt to be traded on an exchange. In order to achieve Level II status, the issuing firm must comply with GAAP accounting principals and register with the U.S. Securities Exchange Commission (SEC). Firms issuing under Level I status avoid having to comply with GAAP accounting principals. Asian firms also participated in private placements under rule 144a. Rule 144a allows these firms to place depository receipts with large international institutional investors while

avoiding both SEC registration and GAAP accounting regulations. Finally, depository receipts can be issued to non-U.S. institutional investors under Regulation "S".

The first Asian countries to tap into foreign markets using depository receipts were Hong Kong and Singapore. Both Neptune Orient Lines LTD, Singapore, and Applied International Holding Limited, Hong Kong, issued over the counter (OTC) ADRs in January 1989. Following these international offerings, companies from the Philippines and Korea decided to issue depository receipts in June 1990 and December 1990 respectively. The Korean ADR issue in 1990, Samsung Company Limited, was the first Asian depository receipt to be filed under Rule 144a. The success of these four firms appeared to set a precedent.

Companies from Hong Kong enjoyed tremendous success in ADR issuance. Between 1990 and 1997, 101 firms based in Hong Kong issued depository receipts to international investors. This issuance record constitutes over 37% of the total number of depository receipts issued from all of Asia. Nevertheless, the rest of Asia also enjoyed increasing success at depository receipt issuance throughout the 1990s. Several companies from China, Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand also managed to attract foreign investors by issuing ADRs and GDRs. We will examine the record of each country in turn.

Between 1990 and 1997, 49 companies headquartered in Taiwan issued ADRs and GDRs to U.S. and international investors. Roughly 60% of these companies decided to issue under Rule 144a. This decision allowed companies to ignore SEC registration. Eleven of the remaining 20 companies issued under Regulation "S". The bulk of these companies issued depository receipts between 1995 and 1997. Of the 49 companies that raised capital through depository receipts, only one, Taiwan Manufacturing Semiconductor, issued ADRs under Level II. More interestingly, this issue was placed on the NYSE in October 1997, three months after the onset of the Asian crisis. Overall, it appears as though Taiwanese companies preferred to avoid SEC registration in their bids for international capital.

Korean firms also enjoyed success in the depository receipts market. Twenty-six of the 29 Korean firms that tapped into this market did so under Rule 144a. The remaining three firms issued Level II public ADRs on the NYSE in 1994 and 1995.

China holds the record for having the largest number of firms to issue Level II public ADRs on the NYSE. Between 1990 and 1997, 10 Chinese firms tapped into the U.S. market using this form of depository receipt. Moreover, the Chinese firm, Shanghai Petrochemical, has the distinction of being the first firm in Asia excluding Japan to be listed on the NYSE under Level II rules. As early as July 1993, U.S. and international investors could trade ADR shares of Shanghai Petrochemical listed on the NYSE through its custodial broker, the Bank of New York. Moreover, Shanghai Petrochemical was the first Chinese firm to issue depository receipts of any kind. It is interesting to note that while China waited until July 1993 to issue its first depository receipt, 28 firms managed to issue depository receipts by 1997, just one shy of the number of firms from Korea, whose first issue occurred in 1990. Clearly, Chinese firms drew considerable interest from international and U.S. capital markets.

Companies from the Philippines and Thailand experienced limited success in the depository receipts market. Between 1990 and 1997 only 19 firms from the Philippines and 11 firms from Thailand tapped into the international investor base through ADRs and GDRs. Just over half of these firms issued OTC Level I depository receipts. One third issued ADRs under Rule 144a. Finally, one firm from the Philippines, the Philippine Long Distance Telephone Company, issued ADRs under Level II on the NYSE.

Indonesian and Malaysian companies issued the smallest number of ADRs and GDRs. Only 10 firms from Indonesia and 8 firms from Malaysia issued depository receipts between 1990 and 1997. Of these 18 firms, only 3 from Indonesia issued under Level II on the NYSE. The remaining 15 firms issued either OTC under Level I or under Rule 144a.

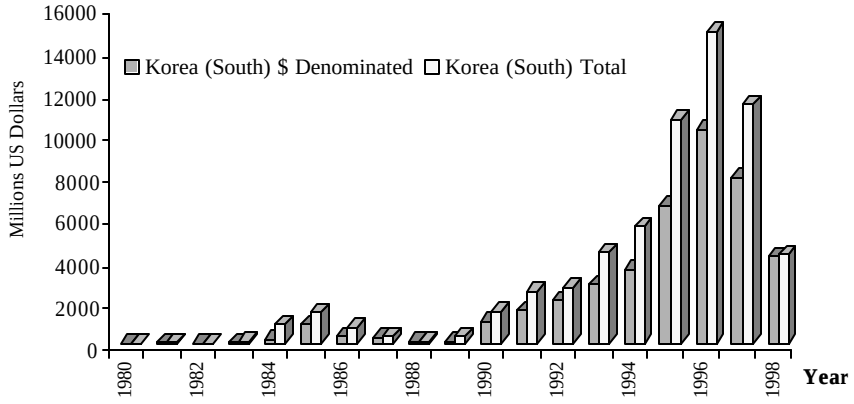
While ADRs and GDRs provided Asian firms with an attractive means of raising international capital, it was not the only way these firms could tap into international capital markets. Throughout the 1990s, the international bond market served as an alternative source of foreign capital for Asian corporations. Between 1990 and 1997, East Asian firms managed to float over $120 billion dollars in the international bond market.[8] Almost three quarters of this amount, roughly $90 billion, was denominated in dollars. While we do not have data on the total amount of Asian international equity placements for this entire period, some comparison can be made. Recall, that between 1992 and 1995, Asian corporations placed roughly $18 billion dollars in international equity markets. Comparing this figure to the amount placed in the international bond markets, we find that for every $1 Asian corporations raised in international equity, they raised $2.5 dollars in international bond offerings.

Korean and Chinese firms led in terms of the total market capitalization of international bond floats. Combined, these two countries accounted for 65% of the total market capitalization of international bonds floated by East Asian issuers. Indonesia, Malaysia, the Philippines, and Thailand each managed to float between $9 billion and $11 billion over the same time period. Taiwanese companies only managed to float just over $5 billion on the international bonds market during the 1990s.

Korean firms led East Asia in terms of total market capitalization of international bonds issuance. In Figure 5, we see that between 1990 and 1997, Korean firms managed to borrow $53.6 billion from the international bond markets. 65% of this total amount was denominated in U.S. dollars. Like many other Asian countries, Korean firms tapped into the international bonds market in increasing quantities through the 1990s. In 1990, the total Korean float amounted to roughly $1.5 billion. By 1993 the total float had increased to almost $4.3 billion. In 1997, Korean firms borrowed just over $11.4 billion from international investors in the international bonds market. We will see that this pattern of increased participation was common among East Asian corporations.

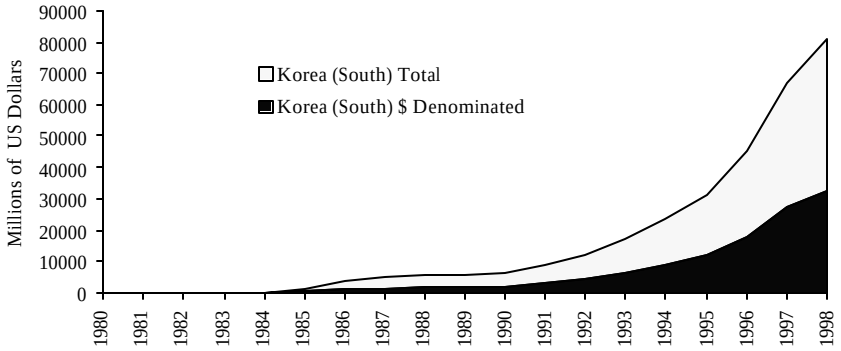
Figure 3: Korean International Bonds

Panel A: International Bond Floats



[8] All international bond data comes from Capital Data's Bondware Database.

Panel B: International Bonds Outstanding



Source: Capital Data Bondware

As Korean firms continued to issue debt in the international bonds market, the total debt outstanding for the country increased. Ignoring the prepayment of loans, we find that the total of international bonds outstanding increased dramatically during the 1990s. In 1990 the total amount of Korean issued international bonds outstanding was $3.9 billion. As of 1993, this figure had increased to $10.3 billion. By 1996, the total amount of Korean issued international bonds outstanding stood at $27.2 billion. More importantly, about 66% was dollar denominated.

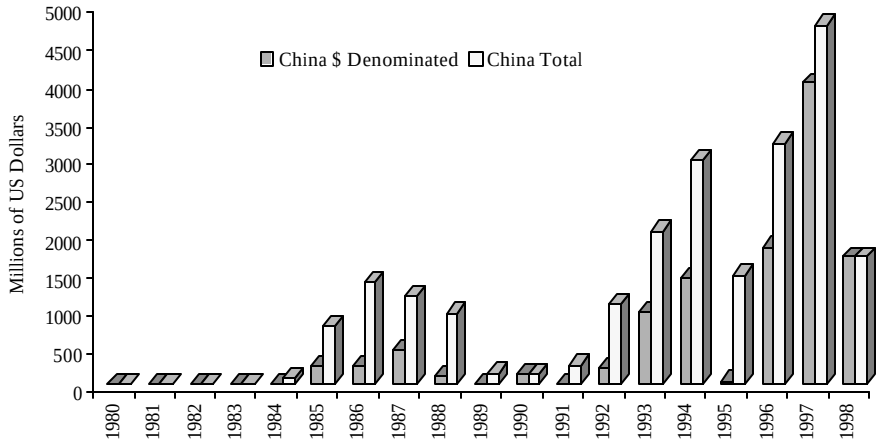
In order to appreciate the magnitude of this debt, we have constructed country level leverage ratios. A firm's leverage ratio can be interpreted as providing some evidence of the financial risk borne by the equity holders of the firm. Our country level leverage ratios provide some indication of the financial risk to investors interested in the country as a whole. We calculate country level international bond leverage ratios for a given year as the total amount of international bond outstanding at the year's end divided by the market capitalization of the country's stock market. This ratio is only a proxy for a leverage ratio. First, the international bond issuing firms may or may not belong to the constituents of the national stock market. Secondly, East Asian governments implicitly or explicitly guaranteed many of these international bonds. Government backing may or may not remove the financial risk of highly levered firms. Nevertheless, our leverage ratios may be interpreted as providing a very "conservative" estimate of financial risk given that the total amount of international bond financing was conducted by a small subset of the firms represented in by the market capitalization of the entire national stock market.

Between 1990 and 1997 Korea's repeated use of the international market added to its overall foreign debt outstanding and increased its country level leverage ratio. In 1990, Korea's country level international bond leverage ratio was 3.5%. By 1993 this figure had increased to 7%. At the end of 1996, the ratio of total international bonds outstanding to equity market capitalization stood at 20%. The leverage ratio for dollar-denominated international bonds had grown to 13% by 1996.

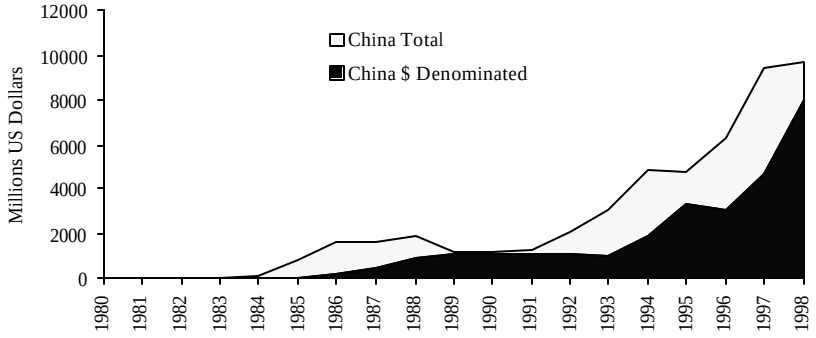
Chinese firms were also very successful in their efforts to raise capital in the international bond market. See Figure 4. Between 1990 and 1997, China floated $15.8 billion on the international bond market. In contrast to Korea, just over half of this total float was denominated in U.S. dollars. However, like Korea, China's involvement in the international bond market increased throughout the 1990s. Between 1990 and 1994, a span of 5 years, Chinese firms raised a total of $6.4 billion in the international bond market. In contrast, in the short span of two years between 1996 and 1997, Chinese firms raised over $8 billion.

Figure 4: Chinese International Bonds

Panel A: International Bonds Floated



Panel B: International Bonds Outstanding



Source: Capital Data Bondware

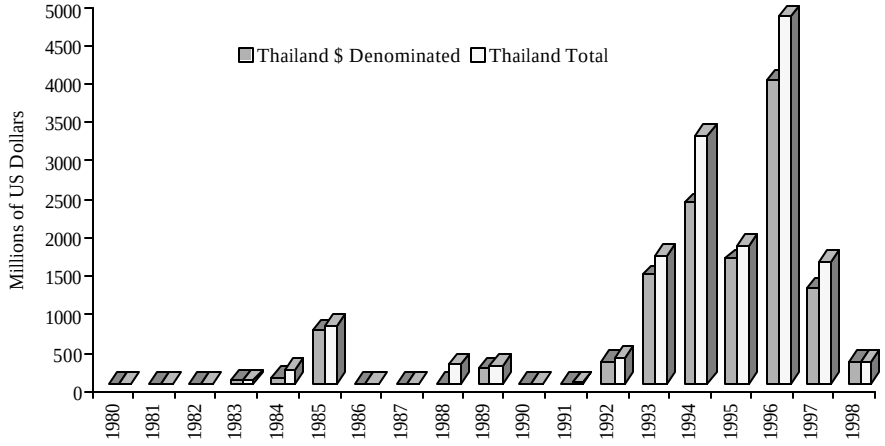
The rapid increase in international bond issuance by Chinese firms contributed to the 150% increase in international bonds outstanding between 1990 and 1997. Despite this increase, China's country level international bond leverage ratio was not significantly affected between 1992 and 1995. In fact, the leverage ratio actually decreased from its peak at 25% during 1992 to 8% in 1995. While the

decrease in the country level international bond leverage ratio can be interpreted as a reduction in the financial risk, the greatest reduction in Chinese financial risk stems from the implicit government guarantees on its private foreign corporate debt.

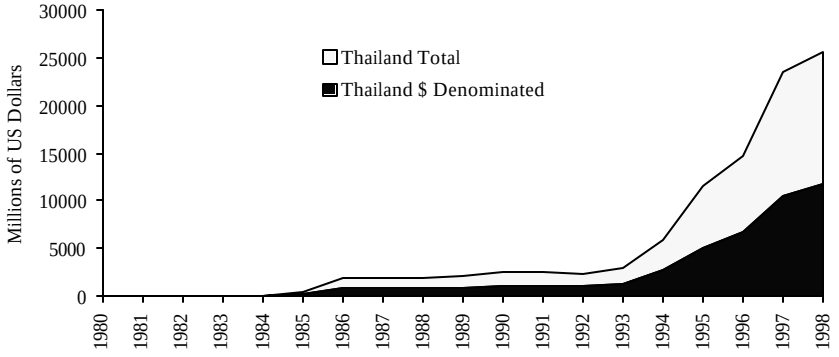
Thai companies issued the third largest amount of international bond debt of any East Asian nation during the period 1990 to 1997. See Figure 5. During this period, Thailand floated just over $10.8 billion on the international bond market. Over 80% of this debt was denominated in U.S. dollars. By the end of 1997, Thailand had accumulated $12.9 billion dollars foreign debt outstanding from its international bond market activity. Almost 85% of this debt outstanding was denominated in U.S. dollars. Almost one half of this debt came from international bond market activity in 1995 alone.

Figure 5: Thailand International Bonds

Panel A: International Bonds Floats



Panel B: International Bonds Outstanding



Source: Capital Data Bondware

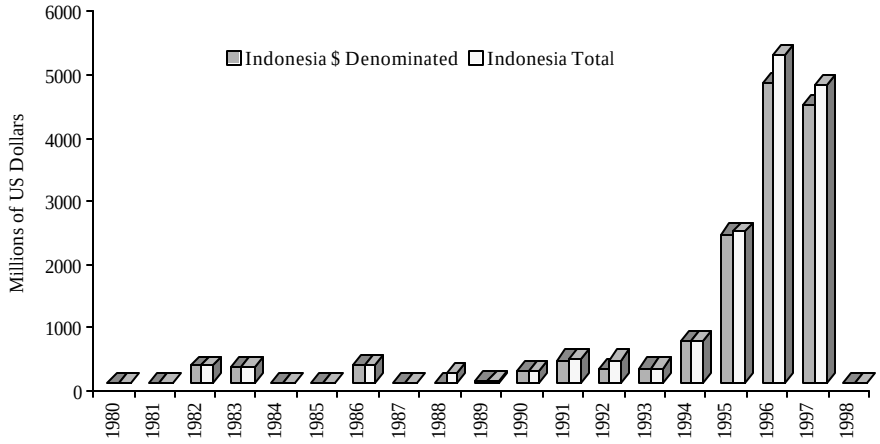
While Thailand's country level ratios were never as high as Korea's or China's, the ratio did increase dramatically over the course of the 1990s. Between 1993 and 1996 this leverage ratio more than

tripled from 1% to 7%. Clearly, Thailand activity in the international bond was a factor in this dramatic increase. Moreover, Thailand carried a higher percentage of dollar-denominated debt than either Korea or China.

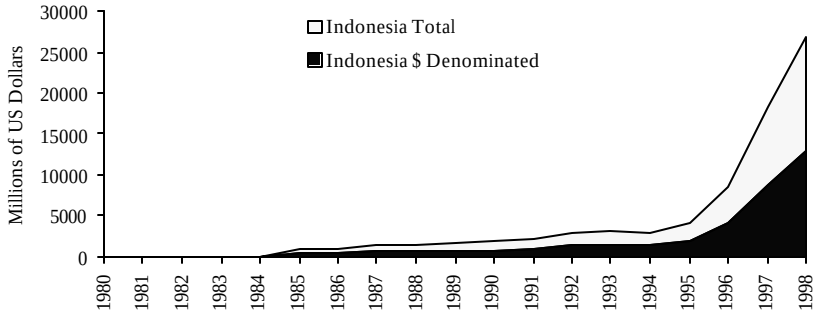
Indonesia, Malaysia, and the Philippines had similar experiences in the international bond markets. Each managed to float between $8.2 billion and $14.2 billion between 1990 and 1997. See Figures 6, 7, 8 and 9 .

Figure 6: Indonesian International Bonds

Panel A: International Bond Floats



Panel B: International Bonds Outstanding



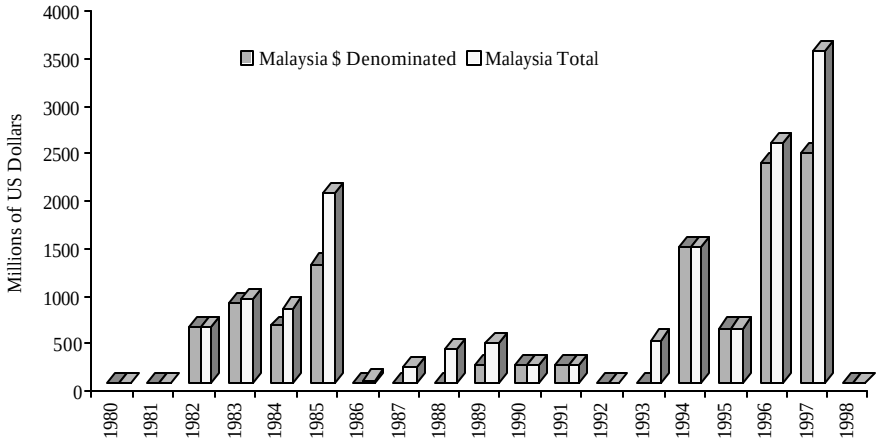
Source: Capital Data Bondware

All three of these countries experienced the greatest increases in their international bond floats between 1994 and 1996. Roughly 80% and 90% of both the Malaysian and the Philippine total floats were denominated in dollars. Dollar denominated floats in Indonesian contributed to 93% of the total amount. More interestingly, we find that in the case of Indonesia, the country level international bond leverage ratio declines significantly over the decade: from 13% in 1990 to 4.8% by the end of 1996. The reason for this decline is that the amount of Indonesian international bonds outstanding remains relatively small throughout the 1990s. In fact, between 1990 and 1997 the amount of

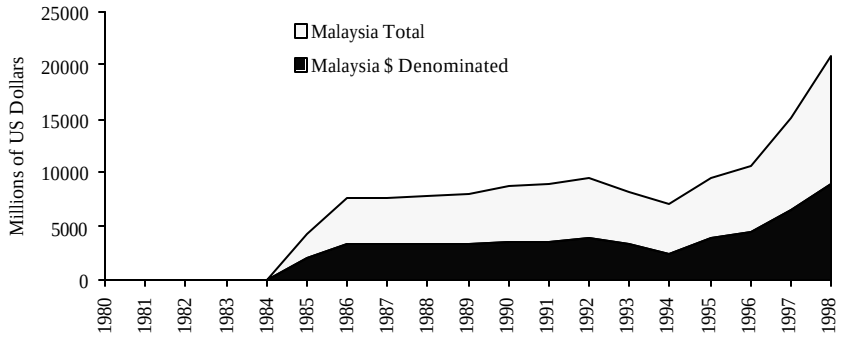
Indonesian international bonds outstanding stays below $10 billion. The Malaysian country level international bond leverage ratio also decreases over the same time period. In 1990 Malaysia's ratio 7%. By the end of 1996 the ratio dropped to 1.5%. The decline in the Malaysian leverage ratio can be understood in light of the outstanding performance of the Malaysian equity market during the 1990s. The buy and hold return on the IFC Malaysian Index between 1990 and 1996 exceeded all other East Asian countries.

Figure 7: Malaysian International Bonds

Panel A: International Bond Floats



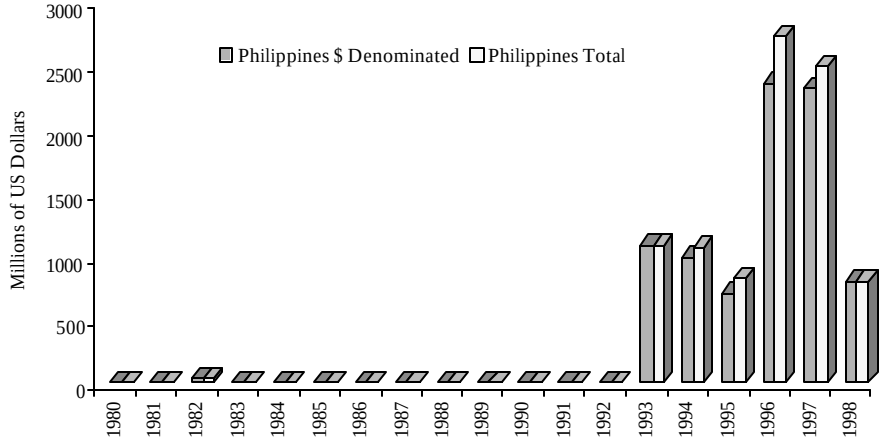
Panel B: International Bonds Outstanding



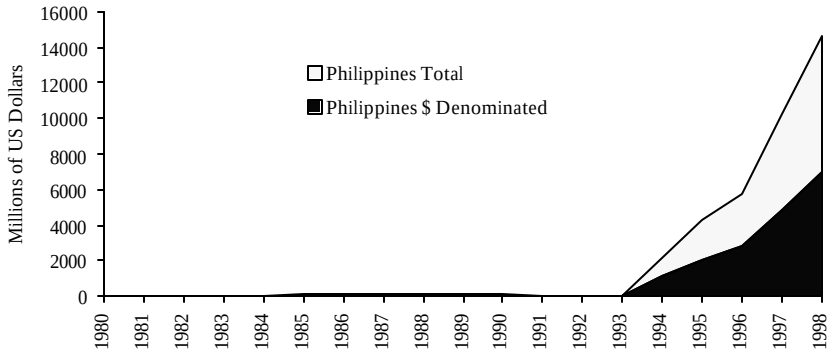
Source: Capital Data Bondware

Figure 8: Philippines International Bonds

Panel A: International Bond Floats



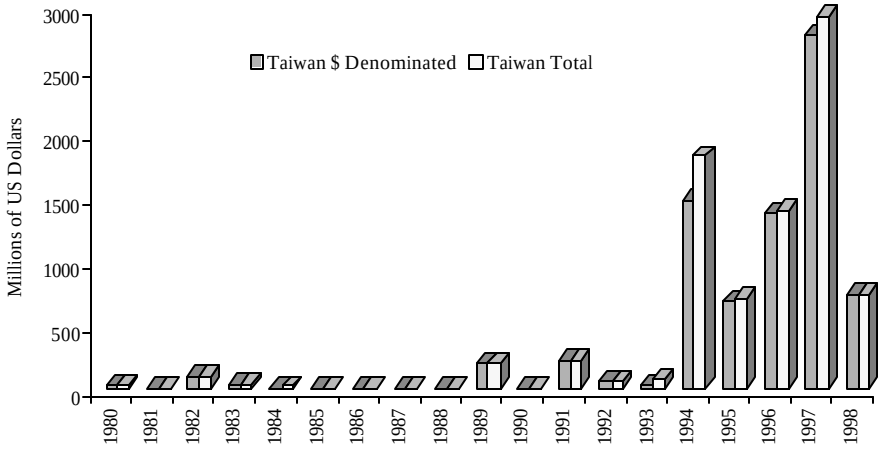
Panel B: International Bonds Outstanding



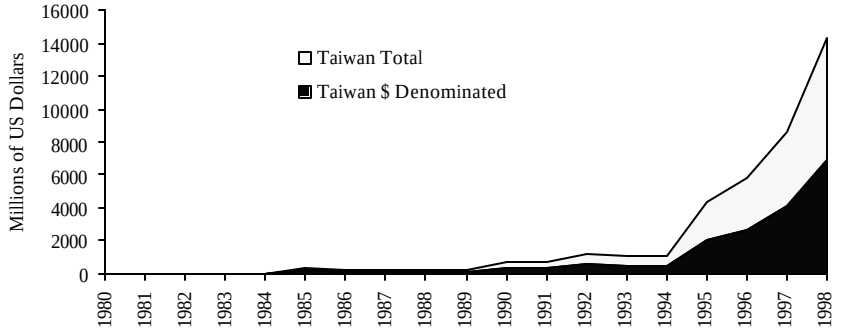
Source: Capital Data Bondware

Figure 9: Taiwan International Bonds

Panel A: International Bond Floats



Panel B: International Bonds Outstanding

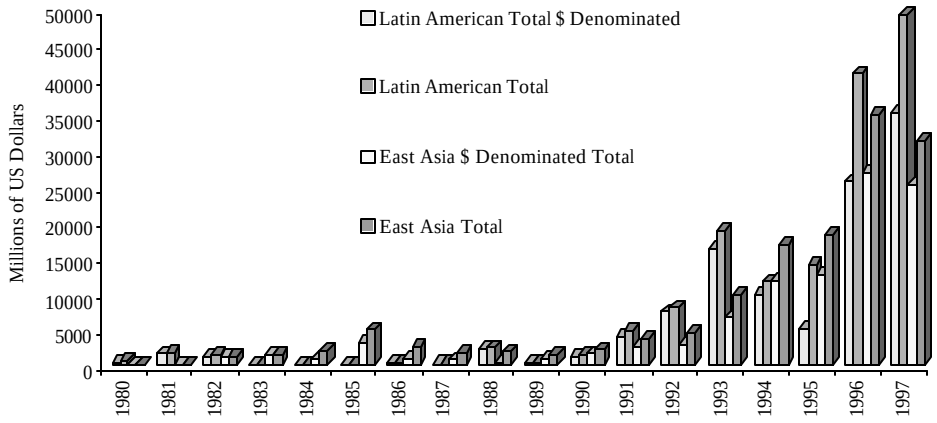


Source: Capital Data Bondware

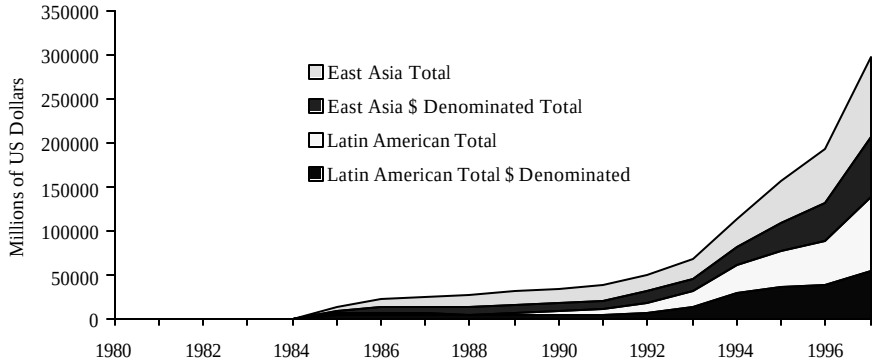
The ability of East Asian companies to tap into this international market can be judged vis-à-vis their Latin American counterparts. Figure 10 portrays the total international bond floats from emerging markets. Between 1990 and 1997, Latin American companies succeeded in issuing just over $104 billion in international bonds. The fact that Latin American surpassed their East Asian counterpart in total international bond issuance is astounding considering that the Latin American debt crisis remains a recent memory for most investors. The data concur with this assertion. Between 1982 and 1989, Latin America was only able to raise $4.3 billion in the international bond market. In fact, in 1983 and 1984, Latin America was unable to raise a single penny in these markets. Obviously, the Latin American debt crisis in 1982 had a noticeable impact on the ability of Latin American firms to raise capital outside their national boundaries. During this same period, East Asian appeared unaffected by the crisis. They managed to borrow over $16.6 billion in the international bond market between 1982 and 1989. Despite the East Asian advantage during the late 1980s and early 1990s, Latin American firms managed to convince investors of their financial strengths towards the end of the 1990s. Between 1990 and 1997 Latin America managed to float amost 150 billion dollars in international bonds, almost 30 billion more than was issued out of East Asia.

Figure 10: Regional Shares of International Bonds

Panel A: International Bond Floats



Panel B: International Bonds Outstanding



Source: Capital Data Bondware

II.C New Capital Mobilization and Privatization

Perhaps, the most conclusive evidence supporting the assertion that Asian capital markets succeeded at securing new funds for capital-starved organizations can be found by looking at the successful privatization record throughout the region during the 1990s. In fact between 1992 and 1995, Asian governments sold stakes in state-owned enterprises amounting to 3% of the total market capitalization of their local stock markets on average per year. Of course, not all of the proceeds from these privatization efforts came from local investors. In fact, roughly 57% of the $18 billion in revenue during this period was paid for in foreign exchange.

The most popular forms of privatization in Asia were public offerings and new share issuance. In 1994 and 1995 Asian countries experimented with a third form of privatization designed to increase foreign participation: ADR issuance. The success of these privatization efforts resulted from the successful marketing and public interests in these public offerings. The ability of local capital markets to absorb 3% a year in new issues provides some testimony of the overall maturity of these capital markets. The sustained foreign interest in the public offerings and international equity offerings of these state-owned enterprises serves as a signal of foreign investors' commitment to the region during the early 1990s.

Despite the impressive efforts made throughout the region, Asian privatization revenues from 1990 to 1996 paled in comparison to the revenues earned by Latin American countries. Comparing the two regions, we find that Asia earned only one third of the amount from privatizations that Latin America earned over the same period. Moreover, the Asian privatization process slowed dramatically in 1996. Across the region, the privatization revenues dropped by almost 50% from their levels in 1995 and by over 66% from the regional high in 1993. This decrease can not be attributed to investors' loss of interest in privatization worldwide. Latin America experienced a 300% gain in privatization revenues between 1995 and 1996. The dramatic slowdown in the privatization process can be attributed to a combination of two factors: diminishing support for privatization programs among the Asian electorate, poor performance of public offerings due to flat performance in Asian equity markets overall.

More insight can be gained by looking at the privatization efforts of each country. China, Indonesia, and Malaysia led the Asian privatization effort in terms of gross privatization revenues. Malaysia's privatizations alone constituted roughly one third of the entire region's total revenues. Between 1990 and 1995 the government earned over $9.1 billion from the privatization of 30 separate firms. Most of this privatization program was planned in advance. In February of 1991, Malaysia released its Privatization Master Plan that called for the privatization of key industries, including the national electrical company, Tenega Nacional, and the national automobile company, Perusahaan Otomobil Nacional. The public offering of Tenega Nacional was the largest to date in Asia, generating the equivalent of $1.2 billion dollars in local currency. This sale confirmed the government's commitment to its privatization plan. Between 1993 and 1994 the Malaysian government sold 50% of its position in the national airline, Malaysia Airlines, and began to sell off its interests in various shipping concerns, agricultural and forestry firms, and petroleum firms. In 1995 the Malaysian government sold 21.3% of Petronas Gas to a combination of domestic and international investors, generating a total of $1.1 billion. Nearly a third of this amount was in the form of hard foreign currency. The Privatization Master Plan had a significant impact on the Malaysian economy overall: between 1992 and 1995, the proceeds generated from privatization averaged 3% of annual GDP. More importantly, the privatization efforts demonstrated the ability of local capital markets to successfully mobilize new equity. Roughly one quarter of the privatization, a little over $2 billion, resulted from public offerings in local capital markets.

The Chinese government's privatization earnings between 1990 and 1996 amounted to just over $7.9 billion. As was the case in Malaysia, the bulk of these earnings were generated between 1992 and 1995. However, unlike Malaysia, China's successful privatization plan was implemented without an official government schedule. The most interesting aspect of the Chinese privatization experience is the method by which China managed to sell off its state-owned enterprises. All privatization efforts were brought about through equity issues floated on the Shanghai and Shenzhen exchanges. Beginning in 1991, the Chinese government began to sell off state-owned enterprises by issuing dollar-denominated B shares on the Shanghai Exchange and Hong Kong dollar-denominated B shares on the Shenzhen Exchange. Between 1991 and 1995, 100% of China's $7.01 billion proceeds were paid for with foreign currency. By comparison, Malaysia earned only $1.24 billion in foreign currency on its $9.11 billion total privatization effort between 1990 and 1995. The largest privatization deal to date in China was the sale of 25% of the equity in Huang Power International in 1994. This deal was fully financed with an ADR float on the NYSE. In 1996 the China Securities Regulatory Commission stipulated that H share offerings would have to meet a minimum issue size, a minimum annual profit, and a three-year earnings record. These new regulations should strengthen the prospects for H share issues in the future.

Remarkably, Indonesia ranked the third highest, amoung East Asian countries, in total privatization revenues between 1990 and 1996, despite the fact that the country's privatization program ranked

second lowest in total number of companies privatized. In fact, Indonesia privatized only 15 firms during this period. Nevertheless, the average size of each privatization in Indonesia was second only to that of Malaysia. The bulk of Indonesia's privatization proceeds stemmed from the privatization of its telecommunications industry. In 1994 PT Indonesian Satellite (INDOSAT) was put up for sale. The government sold 32% of INDOSAT for $1.16 billion. The deal was impressive not only because of its size, but also because 78% of the proceeds came from the issuance of ADR shares on the New York Stock Exchange (NYSE). Clearly, international investors were interested in Indonesia as late as 1994. In 1995 Indonesia returned to this market to help in its privatization of PT Telekomunikasi. While the total sale of PT Telekomunikasi exceeded that of the INDOSAT privatization, this privatization relied to a lesser extent on the US market: only 37.5% of the $1.68 billion deal was financed by ADR issuance. The pace of privatization decreased by over 50% between 1995 and 1996. During this time, Indonesia concluded only two sales. The combined earnings from the sale of PT Telekom and Bank Negara brought in just over $1 billion for the Indonesian government. It appears that the privatization slowdown in Indonesia was mainly caused government in fighting over the merits of privatization, as well as disagreement over which firms should be privatized.

Following the Foreign Investment Act in June 1991, the Philippines embarked upon its own privatization program. Between 1991 and 1995, the Philippine government placed 80 separate business onto the privatization docket. In fact, the Philippine government holds the regional record at 51 for number of privatization efforts in a single year for the region. Despite the impressive number of firms put up for sale, the Philippine privatization program ranked fifth in cumulative privatization revenues in Asia. Malaysia, the leader in this category with privatization revenues of $9.1 billion dollars, earned almost three times as much as the Philippines. The Philippines generated lower revenues because its privatization efforts only included small firms. The average amount earned at each privatization amounted to only $41.7 million. Malaysia, on the other hand, earned a little over $267 million on average from each of its privatization efforts. The Philippine privatization effort ran into a roadblock in 1996: the scheduled privatization of Manila Waterworks and Sewerage System was delayed and the deal was not concluded until 1997. According to the World Bank, this delay was typical of all privatization efforts during the year. In aggregate the annual proceeds from privatization efforts dropped 90% from $207 million in 1995 to $22 million in 1996. From the data, it appears as though the pace of privatization had slowed significantly from its high in 1993.

Thailand's revenues from privatization paled in comparison to the rest of Asia. Between 1990 and 1995, the Thai government sold its interests in only six companies. The total proceeds generated from these sales amounted to $950.3 million. While Thailand's total number of privatization sales was not impressive when compared to Indonesia and Malaysia, Thailand was extremely successful at using the capital markets to sell off its vested interests. In 5 out of 6 cases, the privatization sales took the form of public offerings. Moreover, 15% of the total revenue from these public offerings was sold to foreign investors. Most of the sales to foreigners resulted from the privatization of the Thailand petroleum industry, however. It is not obvious that foreigners were interested in the entire Thai economy.

In 1996 the sale of the Khanom Electricity Generating Company included a public offering for $240 million, making it the second largest Thailand privatization to date. As a result, Thailand and China share the distinction of being the only two countries in Asia to experience an increase in privatization revenues from 1995 to 1996. Despite the successful sale of Khanom Electricity, we are unwilling to stipulate that the increase in privatization revenues from 1995 to 1996 signaled either increased government commitment or increased investor enthusiasm for privatization. In the case of Thailand, the privatization record is too sparse to draw any strong conclusion.

II.D New Capital Mobilization and Secondary Market Liquidity

With the exception of Taiwan and Thailand, all East Asian countries experienced increased amounts of trading volume in the stocks that comprised their IFC indices. The value of shares traded in Indonesia rose dramatically since the beginning of the 1990s. In January 1990, the historic 12-month average value of shares traded per month amounted to roughly 350 billion Indonesian Rupiah. By December 1996, this figure had increased more than tenfold to almost 3,700 billion Rupiah.

The value of shares trading in the IFC Korea index increased over 200% from January 1990 to November 1994 before settling at more than 4.5 trillion Korean won in December of 1996. The value of shares trading on the IFC Korea index increased approximately 33% between January 1990 and December 1996.

Malaysia and the Philippines both enjoyed large gains in the value of shares trading between 1990 and the end of 1996. The value of shares trading on the IFC Malaysia index increased by roughly 140% and 180% respectively.

The increase in value traded on the IFC country indices is indicative of a broader trend in the overall stock markets. In fact, according to the FIBV, the total US dollar value of shares traded across the stock markets of China, Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand increased from just under $830 billion in 1990 to $1,179 in 1996. The results for each of the individual exchanges is similar to the statistics provided by the IFC for its country level indices. Combined, the Shanghai and Shenzhen exchanges in China registered the largest percent increase in total value of stocks traded. From their inception in late 1990 and early 1991, the value traded on both exchanges increased from $820 million to $256 billion dollars. Of course this increase coincided with the opening of the Chinese exchanges so we should expect a significant growth in terms of the total value traded. However, China is interesting because in just 4 years after the opening of its exchanges, the total value of shares traded ballooned to impressive heights. In fact, the value of shares traded in China alone in 1996 exceeded the entire value traded across all Latin American exchanges.

The Kuala Lumpur Stock Exchange in Malaysia experienced the second highest growth rate of value traded during the 1990s. Between 1990 and 1996, the US dollar value traded increased by a factor of 15. During the same period, the value traded on the Philippine stock exchange grew by a factor of 19. Indonesia, Korea, and Thailand had less impressive growth rates. The US dollar value of shares traded on those markets increased by factors of 7, 1.3, and 0.9, respectively. Taiwan is the single exception to the East Asian pattern of positive value growth. Between 1990 and 1996 the US dollar value traded on the Taiwan Stock Exchange decreased by 34%.

Asian markets as a whole experienced decreased liquidity during the 1990s. One proxy for the liquidity of a market is the turnover ratio. In 1990 the turnover ratio across the region was 219% per year. By 1996 this ratio had dropped significantly to 117.6%. The single most important reason for this loss in liquidity can be attributed to the massive drop in the total value traded on the Taiwan Stock Exchange. Between 1990 and 1996, the turnover ratio for the Taiwan Stock Exchange decreased from 423% to 204%. Furthermore, both Indonesia and Thailand recorded drops in their turnover ratios. On the other hand, China, Korea, and Malaysia witnessed an increase in liquidity on the stocks listed on their exchanges.

Despite the changes in turnover ratios across East Asia throughout the 1990s, the region stands out among the other emerging markets in terms of the liquidity offered to its equity market investors. Comparing across regions, we find that the turnover ratio in any given year in the 1990s is at least twice as high in Asia as it is in Latin America. In most years, markets are almost three times as liquid in Asia as they are in Latin America. Moreover, the region as a whole experienced a higher equity

market turnover ratio than the United States in every year since 1990. In fact Chinese and Taiwanese equities were the most heavily traded equities in the world.

III. ASIAN CAPITAL MARKET LIBERALIZATION

While all the events and descriptions of East Asian capital markets presented thus far help to paint a clearer picture as to the health and growth of these capital markets during the 1990s, we have deferred until now the issue of financial market integration. The opening of local equity markets and debt markets to foreign investors has the potential to be the most influential event in any emerging market's evolution process.

The process of capital market liberalization implemented in East Asia can be described as one of gradualism. In general, the first step taken was the relaxation of restrictions that limited which industries foreign investors could own. Contemporaneously, many governments established "foreign investment limits". These limits dictated the amount of a firm's market capitalization that could be owned by foreign investors. Throughout East Asia, governments set limits that were low enough to prevent foreign control of domestic industries. Moreover, Asian governments were reluctant to relax foreign ownership limits in certain industries, namely finance and telecommunications. Eventually, East Asia began to remove less obvious barriers to their capital markets. Restrictions governing the convertibility of foreign exchange, repatriation of capital gains, and the payment of dividends to foreigners, were removed.

III.A History of Liberalization Programs

While the generalization presented above serves as a guide to the liberalization of capital markets in Asia as a whole, each country began the liberalization process independently and each set its own pace for the liberalization process. The individuality of each country's liberalization program dictates the extent to which foreign investors may have been able to affect each of the East Asian markets. Therefore, it is important that we consider this cross sectional variation in country liberalization policies when we examine the claim that foreign investors helped to contribute to the financial panic in the region. For this claim to be accurate, we would expect that the countries most effected by the crisis were the most liberalized. We evaluate this possibility by examining the major policy changes that took place in East Asia, and determining the impact of these policies on the underlying capital markets. A summary of major policy changes is provided in various panels of Figure 11.

The opening of Thailand's capital markets to foreign investors began in the early 1980s. In 1983 the Board of Investment criteria were relaxed, permitting foreign ownership in export-oriented firms. Foreigners were prohibited from owning a majority of the shares in firms that produced goods for domestic consumption. In September 1987, Thailand introduced the Alien Board. All foreign trading by companies who had reached their foreign investment limits would be conducted on this specially created exchange. Bekaert and Harvey (1999) argue that this represents the effective opening of the Thailand market.[9]

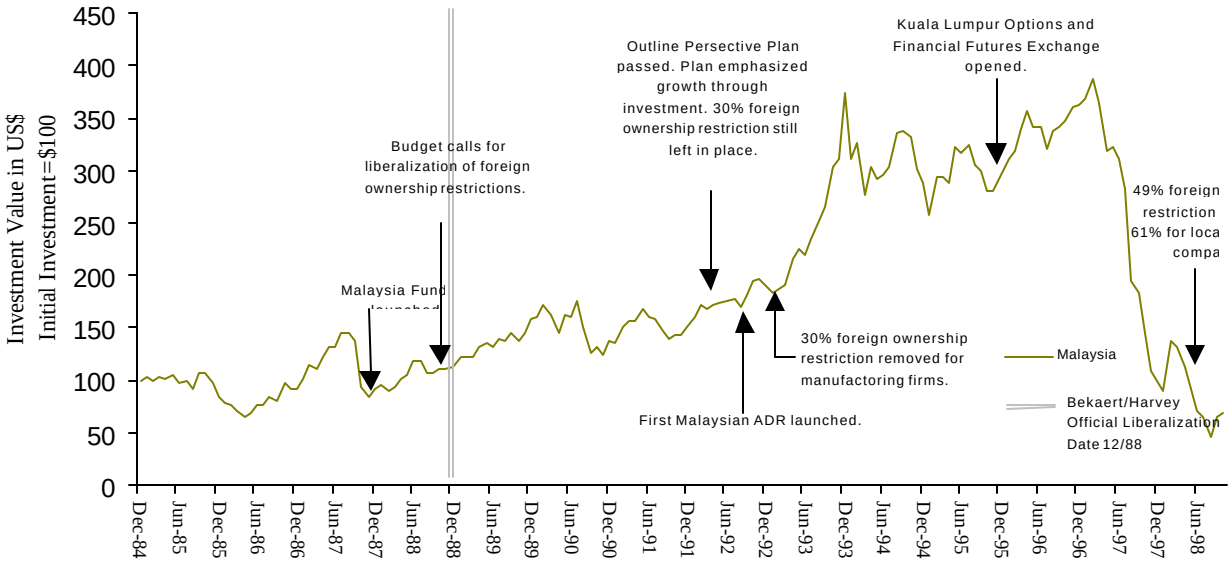
While foreign investors were able to participate in the Thailand market as early as 1987, they did so under strict rules governing the repatriation of profits, foreign exchange conversion, and the payment of dividends to foreigners by domestic companies. In fact, until January 1990, all domestic firms had to seek prior approval before they could pay dividends to foreign investors. In April 1991 several rules regarding repatriation of profits and the conversion of foreign currency were finally relaxed. Thus, while foreign investors could participate in Thailand as early as 1987, they were treated as "second class citizens" in their equity market investment activity.

[9] Bekaert, Geert, and Campbell R. Harvey. "Foreign Speculators and Emerging Equity Markets," Duke Working Paper, 1999.

Malaysia became the second East Asian nation to officially open its capital markets to foreign investors. See Panel A in Figure 11 . The Malaysian case is interesting because the liberalization program put into effect in late 1988 was the antithesis of a policy that began in 1971. During the 1970s the Malaysian government actively pursued a policy to reduce the level of foreign ownership of Malaysian stocks from 55% of market capitalization in 1970 to 30% by 1990. The plan was effective. By 1990, foreigner investors owned an estimated market share less than 25% of Malaysia's market capitalization. In October 1988, the government budget called for complete reversal of these policy goals. The new policy goal was to attract foreign investors.

Figure 11: Capital Market Liberalization

Panel A: Case Study of Malaysian Market Reform

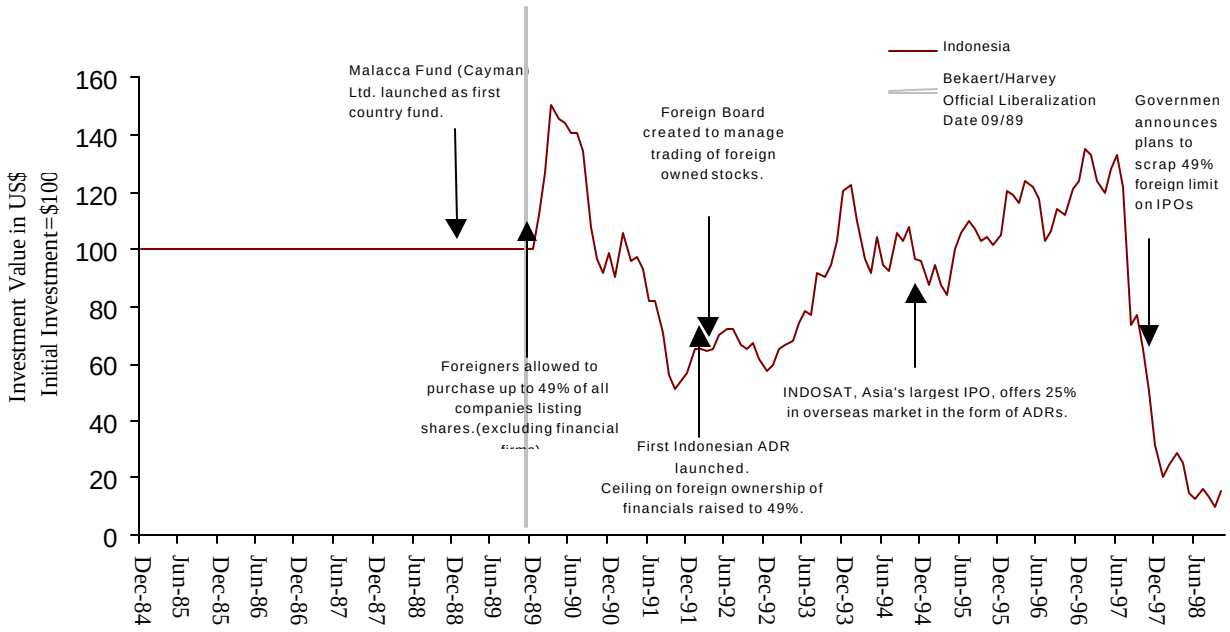


Bekaert and Harvey (1999) list December 1988 as the official liberalization date for Malaysia. Despite this liberalization date, foreigners still faced certain ownership restrictions common throughout the region. The Outline Perspective Plan passed by the Malaysian government in June 1991 encouraged foreign investment while maintaining a 30% cap on foreign ownership of any firm. Foreigners had to wait until the first part of 1993 for the 30% cap to be removed on manufacturing firms.

Barriers to foreign investors in the Indonesian capital markets dates back to at least 1974 when the government passed the Foreign Investment Law mandating majority ownership by Indonesian nationals in all joint ventures with foreign citizens. The Indonesian government began to remove its discriminatory policies as early as 1987. See Panel B in Figure 11. In December of 1987, the government introduced measures that allowed foreigners to purchase shares in 8 pre-specified non-joint venture firms. During 1988 the pace of liberalization picked up.

Figure 11: Capital Market Liberalization

Panel B: Case Study of Indonesian Market Reform

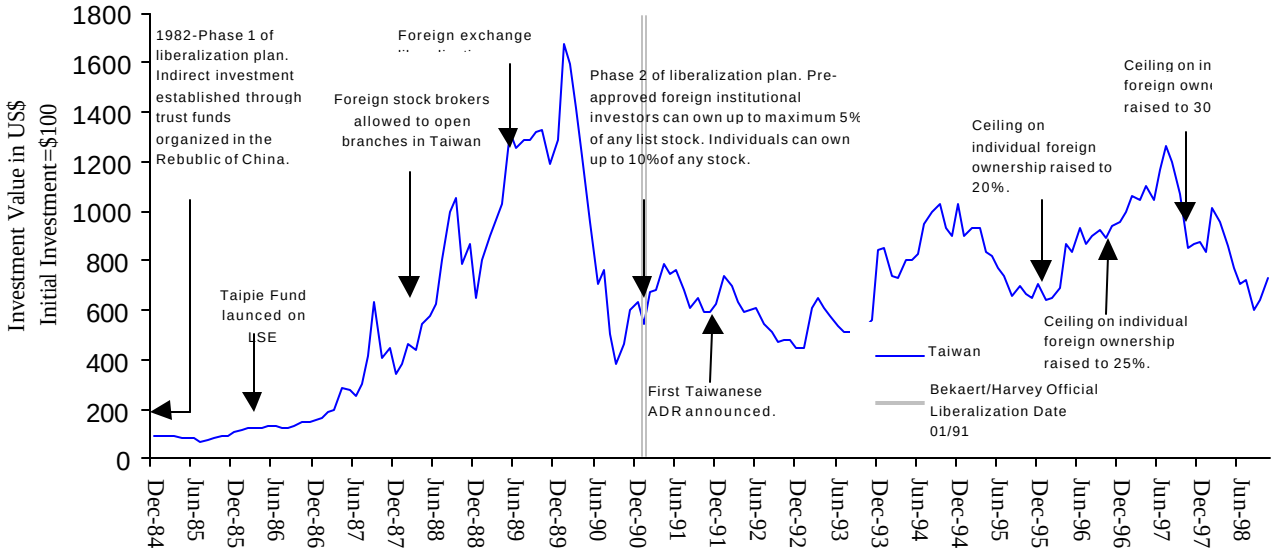


In December 1989, the Indonesian finance minister raised the foreign ownership limit to 49% of market capitalization for all firms excluding financial companies. Bekaert and Harvey (1999) point to this action as the official liberalization for Indonesia. In early 1992 the ceiling on foreign ownership for Indonesian financial firms was raised to 49%. Soon after in July 1992, Indonesia created the Foreign Board to manage the trading of foreign owned stocks. These ownership limits remained in effect until the Asian financial crisis.

In Taiwan the government began to consider financial liberalization as early as 1982. See Panel C in Figure 11. The original plan was to establish trust funds in order to provide foreign investors with an indirect avenue through which they could participate in the Taiwanese market. Full implementation of the first phase of the liberalization program was delayed until August of 1983, at which point the International Trust Company Limited was finally established. In 1986 Taiwan removed restrictions governing the convertibility of foreign exchange. Under the new regulations, foreign investors were able to repatriate profits more freely.

Figure 11: Capital Market Liberalization

Panel C: Case Study of Taiwan Market Reform

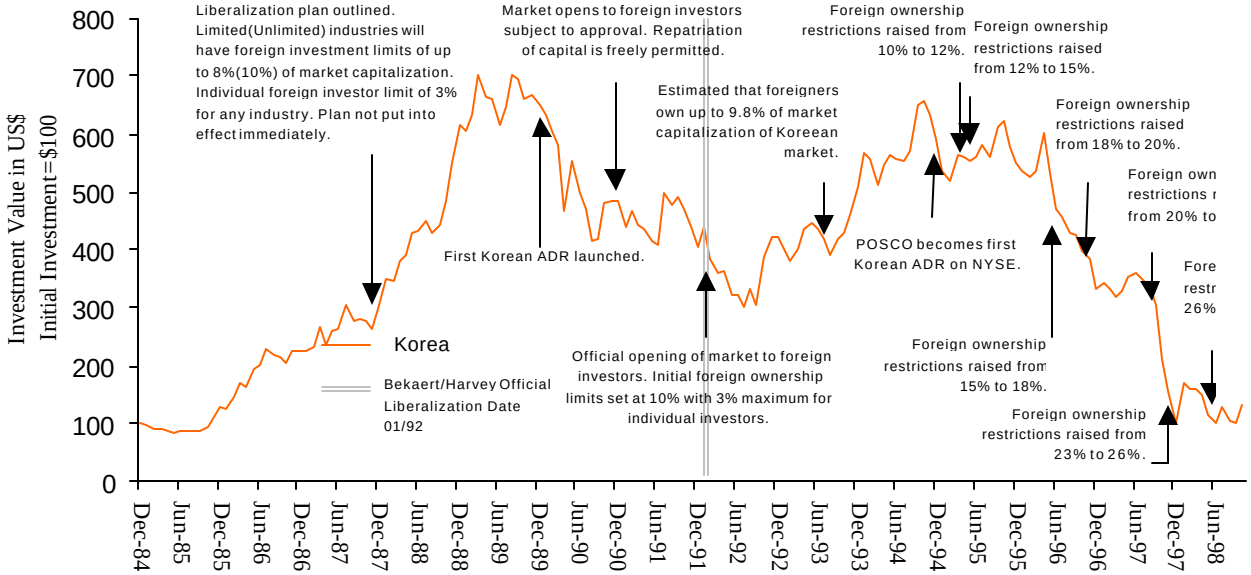


Phase 2 of the liberalization plan was not put into affect until early 1991. In January 1991 all pre-approved foreign institutional investors were permitted to own up to a maximum of 10% of the market capitalization of any company. The ownership level for foreign individuals was raised twice between 1991 and 1996. The final change came in December 1996 when the foreign ownership level was raised to 25% of a firm's market capitalization. In November 1997 this limit was increased to 30%. Once again gradualism defined the slow nature of the liberalization process.

Korea outlined a liberalization plan for financial markets as early as 1987; however, the official opening was delayed until January 1992. See Panel D in Figure 11. Initial foreign ownership limits were set at 10% of market capitalization with a 3% limit for individual foreign investors. Bekaert and Harvey (1999) consider January 1992 as the official liberalization date. During the 1990s, ownership limits were raised. Between December 1991 and December 1997 the foreign ownership limit in Korea was raised on seven separate occasions; each time, it was ratcheted up by no more than 3%. Finally, in June 1998, Korean officials broke with the traditional policy of gradualism and increased foreign ownership levels from 26% to 55%. This move was not only dramatic in size, but it also signaled an overall shift of public opinion. Moreover, it demonstrations the desperate attempts by the Korean government to attract foreign currency during the crisis. Under the new foreign investment limits, foreigners were permitted to own a controlling interest of domestic firms.

Figure 11: Capital Market Liberalization

Panel D: Case Study of Korean Market Reform



III.B The Impact of Liberalization

The liberalization efforts throughout the region facilitated the flow of funds from international investors. At a very rudimentary level, liberalization appears to be related to the crisis. As of December 1996, just 6 months before the Asian financial crisis, foreign investors were only allowed to own up to 25% of any firm's market capitalization in Taiwan. In contrast, foreign investors in Malaysia and the Philippines faced less prohibitive restrictions governing their ownership of domestic firms. As of December 1996, the foreign investor ownership limits for Indonesia and Malaysia were 49% and 30%, respectively. The economies that were most affected during the Asian crisis were those that pursued the most aggressive liberalization program. Moreover, these economies were the first in the region to "effectively" open their capital markets to foreign investors.

On the surface it appears as though cross sectional variation in official liberalization programs may in some way account for the cross sectional variation in the severity of the Asian financial crisis. Are foreign portfolio investors and speculators therefore the cause of the crisis?

Several observers have argued that foreign speculation increases the volatility of local capital markets. Some have gone so far as to blame individual foreign speculators like George Sauris for the increased volatility of Asian markets during the crisis. Despite these accusations, the data suggests a different story. In fact, the average annualized US dollar stock market return volatility over the five years after official liberalization decreased in all but one of the East Asian countries from its level in the five years proceeding liberalization (the only exception being Thailand). [10] For example, the average annualized volatility of US dollar returns was 31.9% during the five years prior to Malaysia's official liberalization. Following the official liberalization, the average return volatility over the next five years dropped to 21.5%. Similarly, in the Philippines, the average US dollar return volatility five years

[10] Liberalization date as defined by Bekaert and Harvey (1999).

before and five years after its official liberalization dropped from 41.9% to 27.1%. Thailand's unconditional US dollar return volatility increased from an annualized 18.5% average over the five years prior to its liberalization to 34.7% in the five years after its liberalization.

These statistics do not provide sufficient evidence to make the claim that financial integration leads to lower volatility, however. Historical average estimates of volatility cannot disentangle the impact of financial market liberalization from other dynamic changes that occurred simultaneously in these economies. Panel A of Table 1 demonstrates that the number of companies included in the IFC country level indices increased, and the concentration ratio of individual firms in these indices decreased after liberalization. Standard portfolio optimization theory suggests that we should expect a reduction in variance as we incorporate additional firms into the market. Furthermore, we notice that each market achieved higher risk ratings from Institutional Investor's Credit Ratings. Increased perceived credit worthiness may coincide with lower levels of return volatility. Ideally, we would like to assess the impact of financial market liberalization on return volatility while controlling for these other contemporaneous effects.

Table 1: Economic Fundamentals Before and After Liberalization

Panel A: Financial Market Characteristics

Country	Number of Companies		Concentration Ratio		Market Capitalization to GDP		Cross Sectional STD		FXV	
	5 yrs before	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*
Indonesia	.	57.375	.	0.183	.	0.087	.	0.118	.	0.004
Korea	53.267	136.655	0.177	0.209	0.237	0.285	0.082	0.088	0.008	0.006
Malaysia	40.426	62.361	0.224	0.193	0.370	0.905	0.106	0.094	0.013	0.010
Philippines	21.017	37.328	0.335	0.257	0.093	0.322	0.135	0.122	0.016	0.026
Taiwan	44.917	79.852	0.205	0.161	0.491	0.503	0.111	0.085	0.014	0.011
Thailand	9.733	30.803	0.349	0.241	0.030	0.166	0.073	0.104	0.023	0.008
Mean	33.872	67.396	0.258	0.207	0.244	0.378	0.101	0.102	0.015	0.011

Region	Number of Companies		Concentration Ratio		Market Capitalization to GDP		Cross Sectional STD		FXV	
	5 yrs before	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*
Latin America Mean	25.397	40.363	0.209	0.236	0.088	0.245	0.161	0.153	0.081	0.098
% Change (Before/After)		0.589		0.127		0.157		-0.051		0.220
Pacific Rim Mean	33.872	67.396	0.258	0.207	0.244	0.378	0.101	0.102	0.015	0.011
% Change (Before/After)		0.990		-0.197		0.134		0.005		-0.273
Emerging Eurasia Mean	32.718	56.201	0.310	0.239	0.121	0.223	0.108	0.112	0.023	0.023
% Change (Before/After)		0.718		-0.226		0.101		0.031		0.013

Panel B: Economic Fundamentals

Country	GDP Growth		GDP per Capita Growth		Trade Sector to GDP		Inflation		Consumption to GDP	
	5 yrs before	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*
Indonesia	5.268	6.941	3.104	5.578	0.447	0.529	7.042	8.329	0.683	0.645
Korea	9.563	7.121	8.500	6.033	0.646	0.627	6.871	5.443	0.628	0.643
Malaysia	4.353	8.738	1.696	5.671	1.153	1.624	1.556	3.620	0.653	0.652
Philippines	4.404	2.681	1.890	-0.220	0.563	0.727	9.333	9.958	0.802	0.851
Taiwan	7.638	5.490	7.638	5.490	0.835	0.759	2.208	3.785	.	.
Thailand	5.930	10.733	3.970	9.157	0.496	0.728	2.301	4.951	0.756	0.659
Mean	6.193	6.950	4.466	5.285	0.690	0.832	4.885	6.014	0.723	0.690

Region	GDP Growth		GDP per Capita Growth		Trade Sector to GDP		Inflation		Consumption to GDP	
	5 yrs before	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 yrs before*	*5 yrs after*	*5 years before*	*5 years after*
Latin America Mean	2.605	4.989	0.690	3.228	0.338	0.358	340.558	298.213	0.755	0.789
% Change (Before/After)		0.024		0.025		0.020		-0.423		0.034
Pacific Rim Mean	6.193	6.950	4.466	5.285	0.690	0.832	5.149	6.651	0.723	0.690
% Change (Before/After)		0.008		0.008		0.142		0.015		-0.033
Emerging Eurasia Mean	4.413	4.694	1.790	2.321	0.544	0.520	18.149	22.570	0.834	0.818
% Change (Before/After)		0.003		0.005		-0.024		0.044		-0.015

Bekaert and Harvey (1999) offer the following type of analysis. They use time series data relating to fundamental market characteristics, economic characteristics, and market microstructure characteristics from 20 emerging markets as conditioning variables in an event study of the impact of financial market liberalization. We employ the results from their estimation and the average financial and economic characteristic of each Asian country five years before and five years after liberalization in order to evaluate the sources for the change in volatility of Asian markets.

Table 1 Continued: Economic Fundamentals Before and After Liberalization

Panel C: Impact of Financial Market Liberalization on Local Stock Market Volatility

Bekaert and Harvey report the following regression coefficients from their panel regression specifying fitted volatility as the dependent variable.

NUMC	CONCR	STDL2	INFL	FXV	XMGD	CCR	MCAP	STD	PRE	DURING
-0.005	0.236	0.205	0.132	1.061	0.472	0.02	-0.184	1.325	-0.018	-0.003

Using the data presented in Panels A and B we can calculate the change in volatility predicted as a result of the changes in the underlying economic and financial fundamentals:

	Total	NUMC	CONCR	STDL2	INFL	FXV	XMGD	CCR	MCAP	STD
Indonesia	NA	NA	NA	NA	0.022	NA	0.038	-0.003	NA	NA
Korea	-0.059	-0.005	0.008	0.001	-0.031	-0.003	-0.009	0.001	-0.009	0.000
Malaysia	0.200	-0.002	-0.007	-0.002	0.111	-0.003	0.222	0.002	-0.098	-0.008
Philippines	0.016	-0.003	-0.019	-0.003	0.009	0.010	0.077	0.005	-0.042	-0.004
Taiwan	-0.003	-0.003	-0.011	-0.005	0.071	-0.003	-0.036	0.001	-0.002	0.000
Thailand	0.139	-0.006	-0.025	0.006	0.101	-0.016	0.110	0.003	-0.025	0.006

Panel D: Impact of Financial Market Liberalization on Local Stock Market Excess Returns

Bekaert and Harvey report the following regression coefficients from their panel regression specifying fitted volatility as the dependent variable.

NUMC	CONCR	STDL2	INFL	FXV	XMGD	CCR	MCAP	STD	PRE	DURING
-0.012	0.036	0.583	-0.011	-0.204	0.009	-0.047	NA	NA	0.011	0.011

Using the data presented in Panels A and B we can calculate the change in volatility predicted as a result of the changes in the underlying economic and financial fundamentals:

	Total	NUMC	CONCR	STDL2	INFL	FXV	XMGD	CCR	MCAP	STD
Indonesia	.	.	.	.	.	.	.	0.007		
Korea	0.026	-0.011	0.001	0.004	-0.001	0.000	0.000	-0.003		
Malaysia	0.023	-0.005	-0.001	-0.007	0.001	0.001	0.005	-0.005		
Philippines	0.008	-0.007	-0.003	-0.008	0.001	-0.002	0.002	-0.011		
Taiwan	0.013	-0.007	-0.002	-0.015	0.003	0.001	0.000	-0.001		
Thailand	0.030	-0.014	-0.004	0.018	-0.004	0.003	0.001	-0.006		

Panel C of Table 1 presents the results of this analysis. The overall change in US dollar return volatility in each of the 5 countries presented varies across country. Korea and Taiwan experience an increase in volatility after controlling for changes in their economic and financial characteristics. On the other hand, US dollar return volatility decreased after liberalization in Malaysia, the Philippines, and Thailand. Across all countries, changes in the economic environment that coincided with the official liberalization efforts led to increases in US dollar return volatility. Most of this increase resulted from increases in the inflation rate after liberalization. As suggested above, changes in key financial market characteristics led to decreases in US dollar return volatility in all countries. After controlling for the changing economic and financial market characteristics, the remaining impact of financial market liberalization on US dollar return volatility is less than 1% per annum. These results suggest that increased foreign participation can not be the sole culprit of increased volatility of returns in Asia. Thus, we are hard pressed to believe foreign investors alone accounted for the high level of market volatility during the Asian crisis.

Financial market integration may also impact the expected returns on investments. In completely segmented markets, investors must be compensated for bearing variance risk of the domestic market's portfolio return. Throughout East Asia this risk was quite high, especially during the 1990s. However, in integrated financial markets investors are compensated for covariance risk, where covariance is measured with respect to the global market portfolio. Given the low correlation of emerging markets with developed markets, we might expect that financial market integration would lead to lower expected returns for East Asian equity markets. Of course, this logic indicates that these markets might experience a price increase prior to liberalization, as market participants anticipate liberalization and drive down expected returns.

In order to assess the impact of liberalization on Asian stock market returns we investigate expected returns using a traditional framework, the international capital asset pricing model. Specifically, we

attempt to explain the cross-sectional differences in returns before and after financial market liberalization using an international version of the Sharpe (1964) and Lintner (1965) capital asset pricing model.

Table 2 presents the results of this exercise. Panel A reveals the before and after betas calculated for each of the East Asian US dollar equity market returns. These betas are derived by regressing the monthly US dollar denominated returns of the IFC country level indices for five years prior to Bekaert and Harvey's (1999) identification of the official market liberalization from each Asian market on the corresponding five years of montly return history of the MSCI World index. Provided that the measure of official financial market integration offered by Bekaert and Harvey is relatively accurate, the regression employing the five-year history before integration should not be relevant. Nevertheless, it serves as an interesting reference point from which we can judge the model after the impact of integration.

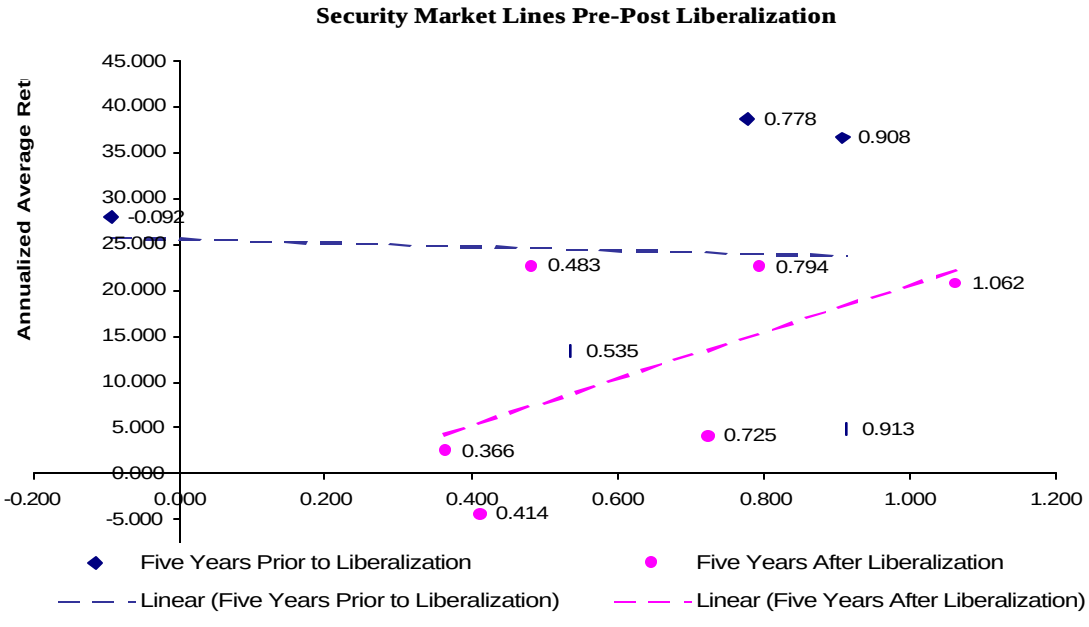
Table 2: Beta and Risk in East Asian Stock Returns

Panel A: Beta and Returns

Data: Returns are U.S. dollar based log returns calculated from IFC Country Indices. Betas are calculated with respect to MCSI World Index.

	Beta	Returns	Beta	Returns
	5 yrs before	*5 yrs before*	*5 yrs after*	*5 yrs after*
Indonesia			0.366	2.465
Korea	0.535	13.371	0.414	-4.384
Malaysia	0.913	4.839	0.794	22.532
Phillipines	0.778	38.715	0.483	22.605
Taiwan	0.908	36.668	0.725	4.155
Thailand	-0.092	27.869	1.062	20.676
Slope Coefficient on Beta	-2.1		25.799	
Standard Error	20.23		18.204	
Security Market Line R^2	0.004		0.241	

Panel B: The Security Market Line and Liberalization



In four out of the five Asian countries presented, the beta decreases after integration. The point estimates of beta using the five-year period prior to liberalization are consistent with those presented in Harvey (1995). However, the coefficient of determination from each of the univariate regressions is less than 10%.

Overall, the model specification fails to accurately describe the cross sectional variation of expected returns in East Asia. Prior to each country's financial market liberalization the security market line has the wrong slope. While the estimated coefficient on beta turns positive after the Bekaert and Harvey (1999) liberalization date, it remains statistically insignificant. These results do not necessarily indicate that Asian economies remain segmented. These simple tests rely only on unconditional moments and thus are unable to capture the significant time variation in expected returns that has been documented by Harvey (1996), Bekaert (1995) and Ferson and Harvey (1997).

Another potential problem with this analysis results from its implicit assumption that these markets switched from complete segmentation to complete integration. However, the evidence we presented earlier suggests that the liberalization reforms in these economies followed a more gradual process. This sort of transition from closed to open capital markets captures the time varying nature of integration suggested by Bekaert and Harvey (1995). Moreover, much of the time variation in expected returns may result from factors that do not rely on financial market integration.

Panel D in Table 1 disentangles the effects on returns of economic and financial market changes from official liberalization. By itself, financial market integration implies an increase in excess returns on the order of 1.3% a month. This increase in is offset by a decrease in excess returns associated with changes in key financial market characteristics. On average, changes in the makeup of East Asian financial markets accounted for a reduction in monthly excess returns of 1.2%. Finally, increases in the East Asian credit ratings further reduced excess returns by another 0.5% per month. In all, the net affect of financial market liberalization, financial market maturation, and economic transformation resulted in lower excess returns across the region. Thus, we expect that the price appreciation associated with the pre liberalization period can be attributed in part to the changes in the financial market's makeup.

III.C Pre-Liberation Investment Alternatives

Investors that were eager to invest in the East Asian markets did not necessarily have to wait for the official government liberalization. Often foreign investors could gain exposure to these markets through country funds issued prior to the official liberalization. However, the diversification benefit of these country funds was ambiguous. Most of these country funds were closed-end funds that were not permitted to offer new shares as the fund grew as investors' interest in the fund grows. As a result, these funds traded at substantial premiums over the Net Asset Value (NAV) of the underlying stocks and this premium eroded any potential gains to diversification that these funds offered.

East Asian countries benefited from allowing these country funds to trade shares in their local markets for at least two reasons, both of which are related to the asymmetry of information between domestic and foreign investors. First, country funds served as one of the few means by which investors could familiarize themselves with the volatility and returns of these emerging markets. Thus country funds served as foreign investors' introduction to East Asian markets. Furthermore, country funds helped to increase the name recognition of East Asian firms among international investors. Increased familiarity with individual firms helped these firms to access international capital markets.

Investors desiring to enter the Indonesia equity market could invest in closed end country funds up to eight months in advance of this market's official liberalization. The Malacca Fund (Cayman) Limited began trading in January 1989. The JF Indonesia closed end country fund began trading on

the London Stock Exchange (LSE) two months later, in March 1989. Prior to the official liberalization date, investors could choose between five different Indonesian country funds, sharing a combined market capitalization of $106 million.

Korean investors were able to select from several viable alternatives to direct foreign equity ownership prior to the market's gradual liberalization process in the 1990s. Twenty-eight country funds were established between November 1981 and December 1991. The combined market capitalization of these country funds was $1.56 billion as of December 1991. Seven of these funds traded as closed-end funds on the LSE. The largest fund, Korean Fund Incorporated, traded on the NYSE from its inception in August 1984.

Several open-end country funds focusing on Korea also emerged during the early 1980s and early 1990s. The majority of these funds were unlisted but were made available to the public. Both Korea Trust and Korean International Trust began issuing shares in November 1981. The advantage that these funds had over their closed-end counterparts was their ability to issue new shares. Hence, in theory, these funds did not sell at a premium. The drawback of these open-end funds was their unlisted nature. Only experienced investors were able to find them.

Foreign investors were less fortunate in their pre-liberalization investment opportunities in Malaysia. As of December 1988, the official liberalization date, only three country funds existed. The first of these funds, Malaysian Ventures Berhad, established in March 1984, was closed to public investors. In December 1987, the Malaysia Fund Incorporated began trading on the NYSE. This closed end country fund had a market capitalization of $98.3 million as of December 1991. Earlier in the same year, the small but open ended country fund, the Wardley GS Malaysia Fund, began trading on the Luxembourg Stock Exchange (LUXSE).

Eight Philippine country funds were introduced prior to this country's official liberalization. One fund, JF Philippine Trust, began trading as early as 1974. While the fund was an open-ended fund, its small size, only $5.9 million under management as of December 1991, and unlisted status provided little justification for arguing that it served as a major channel for foreign investors interested in the Philippines. In 1989 and 1990, several Philippine country funds began trading on the major exchanges. In New York, the First Philippine Fund Incorporated attracted $101.2 million in assets under management in December 1991. The combination of the First Philippine Investment Trust and JF Philippine Fund managed $97 million assets in December 1991 in active trading on the London Stock Exchange (LSE). Between these funds, which traded in New York and London, investors interested in the Philippine equity market had substantial opportunity for investment. Of course, each of these funds traded at substantial premiums due to their closed-end status.

Investors interested in Taiwan could invest in the Formosa Fund as early as March 1986. This fund had many attractive qualities. The Formosa Fund traded on a major exchange, the LSE, it had substantial assets under management as of December 1991, $133.7 million, and it was an open-ended fund. U.S. investors who were unfamiliar with this fund may have been introduced to Taiwan at the inception of the Taiwan Fund Incorporated, in May 1986. This closed end fund traded on the NYSE. Two and a half years later a larger fund emerged that also traded on the NYSE, the ROC Taiwan Fund, which attracted over $244 million in assets under management by December 1991. In total, investors could choose between seven separate Taiwan country funds prior to the market's official liberalization date.

The choices in Thailand were more limited. At the time of Thailand's official market liberalization, October 1987, only two country funds existed that focused on this market. The Bangkok Fund Limited began trading on the LSE in July 1985. As of December 1991, this closed end fund had over $163 million under management. In December 1996, the Thailand Fund issued shares to investors on

the LSE. The open-end nature of this fund allowed investors to avoid the premiums charged in close end funds. Nevertheless, it appeared as though many investors preferred the management of the older closed end Bangkok Fund Limited. As of December 1991, the Bangkok Fund had over three times the value of assets under management as did the Thailand Fund.

IV. ASIAN CAPITAL MARKET CONCENTRATION MEASURES

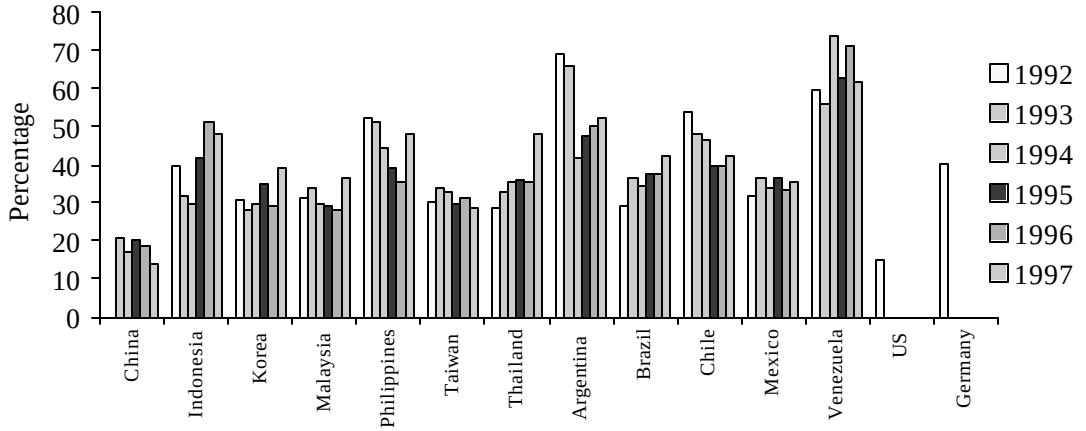
We have established that Asian capital markets experienced real growth during the 1990s. Both local equity and local bond markets increased their market capitalization to varying degrees through new capital mobilization. This growth is exactly what we would expect from maturing capital markets. In fact, we found that in several countries the value of shares traded, turnover ratios, and market capitalization exceeded values found in key developed stock markets. However, despite their growth, local Asian equity markets possessed certain characteristics common to emerging stock markets. In particular, the market capitalization of local Asian equity markets remained highly concentrated among a small number of firms and within few industries. Moreover, the ownership of Asian equity is highly concentrated in the hands of a small number of investors. In the next section, we present several statistics regarding the degree of concentration along various dimensions.

IV.A Concentration of Asian Equity Across Individual Firms

Within many emerging markets, the largest ten firms commanded a disproportionate share of the entire stock market capitalization. The IFC provides a concentration ratio designed to investigate this pattern. The IFC computes the ratio of the market capitalization for the top 10 firms in their global indices to the entire market capitalization of the indices. Figure 12 presents a sample of this data.

According to the IFC data, the top ten firms in their IFCG indices for Asian countries commanded between 13.9% and 52.2% of the market capitalization of the individual country level indices. The IFCG China Index had the lowest concentration ratio. Between 1992 and 1997 the top ten firms on the IFCG China index constituted on average only 18.4% of the index's market capitalization. The most heavily concentrated index in Asia according to this ratio was the Philippine IFCG Index. Between 1992 and 1997, the top ten firms on the Philippine index controlled over 45% of the index's market capitalization. The average of the IFC reported concentration ratios for Indonesia, Korea, Malaysia, Taiwan, and Thailand were 40%, 32%, 31%, 31%, and 36%, respectively.

Figure 12: IFC Top Ten Firm Concentration Ratios



Comparing the top 10 firm concentration ratio of Asia to those of Latin America, we find that, on average, the IFCG Asian indices are less heavily concentrated than the Latin American indices. For example, the lowest concentration ratio among the Latin countries presented in Figure 6 is Mexico whose average concentration ratio between 1992 and 1997 is 35%. Four of the seven Asian countries reported have lower concentration ratios. Moreover, the highest concentration ratio in Asia is reported for the Philippine market. Three of the five Latin markets reported had higher concentration ratios.

While the top ten firm concentration ratio provides some evidence of the degree of concentration in the market capitalization of a country, its focus on the top ten firms ignores concentration of the remaining firms. Ideally, we would like a measure of market capitalization that uses all of the available data. Using the market capitalization of all the constituents in the IFCG indices, we can construct a Herfindahl-type index. The Modified Herfindahl Index is:

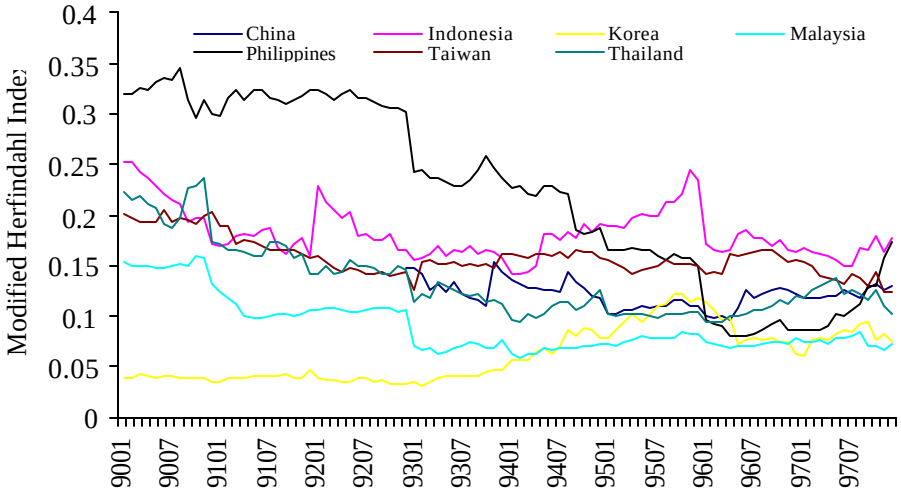
$$\text{Modified Herfindahl Index} = \sqrt{\left(\frac{N}{N-1}\right)\sum\left\{W_i - \left(1/N\right)\right\}}$$

Through a convenient normalization of this sum, we can build an index of market capitalization that spans the unit interval. Under the simple scenario, whereby the IFCG index consists of a single firm, its weight, Wi, equals 1 and the value of the index converges to one. If each firm controls an equal fraction of the entire market capitalization the modified Herfindahl Index returns a value of zero.

Figure 13 presents the times series of the Modified Herfindahl Index for a cross section of emerging markets. In general, all Asian equity markets have index levels less than 0.25. The Philippines is the only country whose index level exceeds this level and it does so only until 1993. The Latin American countries, on the other hand, appear to exhibit a lower degree of concentration relative to Asia. The Latin countries' modified Herfindahl never exceeds 0.20.

Figure 13: Modified Herfindahl Indices of Asset Concentration

Panel A: East Asian Concentration



While this index may seem abstract it helps us to compare the degree of market concentration across countries. For example, consider Korea, Malaysia, and Taiwan. According to the IFC all three countries had roughly the same average concentration ratio using the ratio of top ten firms market

capitalization to the entire market capitalization, 31%. However, this concentration ratio considers only two groups, the top ten firms and the other firms. The modified Herfindahl index in Figure 13 demonstrates that the pattern of concentration across these countries was far richer. In fact, the degree of concentration in Taiwan exceeds that of both Korea and Malaysia.

Consider also the case of Mexico. The IFC reported a concentration ratio based on the top ten firms for this country of 35% throughout the 1990s. By this standard, the Mexican markets appeared be more heavily concentrated than China, Korea, Malaysia, and Taiwan. However, using the modified Herfindahl index we find that Mexico is less concentrated by far than all four of these Asian markets. In fact, Mexico exhibits the lowest degree of concentration of any emerging market displayed in Figure 12.

IV.B Industrial Concentration of Asian Equity Markets

Concentration based upon market capitalization is only one way to measure concentration in emerging markets. For the most part, the stock market capitalization of emerging stock markets tends to be heavily concentrated in a relatively few number of industries. Panel A in Table 3 lists the relative market capitalization weights associated with eight industries for each of the East Asian equity markets.

The eight industries selected are conveniently picked from the eight industry aggregates pre-specified by the IFC. We derive the time series of market capitalization weights from these industries using the individual market weights of the historical constituents of the IFC country level indices. Summing over the individual constituents according to their industry classification gives us the market capitalization of each industry. The weights presented are the time series average of the monthly weights from December 1984 to February 1998.

Our analysis suggests that the IFC indices of East Asian countries were heavily tilted towards the manufacturing and finance sectors of these economies. This result is indicative of the underlying structure of these economies. However, industry concentration is low on the list of priorities of index construction at the IFC. The primary goal of the IFC indices is to cover at least 60% of the entire market of stocks existing in any given country. Therefore, we can not be sure that the economies in these markets are as highly focused in these two industries as would be suggested by an analysis predicated solely on the market weights derived from the IFC indices.

There exits varying degrees of industry concentration across individual countries in Asia. Indonesia's equity market, as measured by the IFC Indonesia index, is heavily tilted towards the manufacturing sector. Korea and Taiwan have similar industrial mixes. In each of these three markets, manufacturing firms make up more than 50% of the total market capitalization of the country's index. Financial firms have the second greatest weight in each of these countries.

Both Malaysia and the Philippines appear to have broader industrial mixes with manufacturing, transports, and finance each claiming shares close to or greater than 20%. Malaysia firms are not easily classified into these 8 pre-specified industrial groups. Roughly 23% of Malaysia's IFC market capitalization is placed into the "other" industry classification.

The firms representing Thailand are predominately finance firms: on average, 50% of the Thailand's market capitalization is made up of this category. Manufacturing firms place second in Thailand constituting 30% of the market capitalization of the IFC Thailand index.

Table 3: Market Capitalization and Value Traded by Industry

Panel A: Industry Market Capitalization as Percent of Total Market Capitalization

	Indonesia	Korea	Malaysia	Philippines	Taiwan	Thailand
Agriculture	0.03	0.00	0.09	0.00	0.00	0.02
Mining	0.01	0.00	0.00	0.16	0.06	0.04
Manufacturing	0.57	0.54	0.17	0.31	0.56	0.31
Transport	0.10	0.17	0.19	0.22	0.01	0.09
Wholesale	0.02	0.06	0.01	0.00	0.01	0.02
Finance	0.15	0.23	0.24	0.29	0.36	0.50
Services	0.03	0.00	0.08	0.00	0.00	0.02
Government	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.08	0.00	0.23	0.02	0.00	0.01

Panel B: Industry Turnover (Industry Value Traded/Industry Market Capitalization)

	Indonesia	Korea	Malaysia	Philippines	Taiwan	Thailand
Agriculture	0.06	0.00	0.01	0.00	0.61	0.04
Mining	0.06	0.00	0.07	0.03	0.16	0.06
Manufacturing	0.03	0.08	0.02	0.01	0.27	0.03
Transport	0.03	0.05	0.01	0.02	0.10	0.02
Wholesale	0.06	0.13	0.02	0.00	0.19	0.02
Finance	0.04	0.06	0.02	0.01	0.09	0.06
Services	0.02	0.03	0.02	0.00	0.44	0.00
Government	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.05	0.00	0.03	0.01	0.00	0.06

Notes: Industry market capitalization is the time series average of industry capitalization 12/84 to 3/98 of the historical constituents of the IFC country index. Turnover is measured as the time series average of the value traded divided by market capitalization for each industry presented.

Table 3 analyzes the average East Asia industrial mix. Nevertheless, as individual industries grow and shrink over time the industrial diversity of the market of the whole may be affected. One way to examine the industrial diversity of an entire market, and to compare this level of diversity across countries, is to examine a modified Herfindahl index coefficient of a country. Harvey (1993) and Divecha et al. (1992) use the modified Herfindahl index to examine diversity of a country's industry base at any given point in time. We extend this analysis to an examination of the time path of the index for each country in East Asia.

The modified Herfindahl index is constructed by summing up the squared market weights of each of the nine pre-specified industries and multiplying by a correction factor. If a country's index places an equal weight on each of the nine industries the Herfindahl index value is zero. As a country industrial base focuses towards one industry the Herfindahl index approaches 1.

Malaysia has the most diverse industry base of all East Asia. Once again, however, we are suspicious of this result because of the large proportion of market capitalization that the IFC does not classify. Ignoring Malaysia for the moment, we see that the Korea, the Philippines and Taiwan have experienced little time variation in their industrial mixes. The Taiwan index has the highest degree of industry concentration of the three countries. Examining Taiwan in detail reveals that the IFC index for this country consists heavily of manufacturing and finance stocks. In fact, from January 1990 to December 1996, these two industries make up a minimum of 82% of the IFC Taiwan index and average 89% of the index throughout the period.

The IFC Korea index has a broader industrial base than Taiwan. The Herfindahl index averages 0.49 in Korea over the sample period, and 0.57 for Taiwan. Examining Korea in more detail we recall from Table 5 that, on average, 17% of Korea's market capitalization is made up of transportation stocks. It is interesting to note that the relative market weights associated with transportation and finance in Korea have switched in importance during the 1990s. Beginning in January 1990 transportation stocks made up 25% of the total market capitalization whereas finance stocks constituted 32% of the total. By December 1996 these weights had reversed with the transportation industry accounting for 31% and the finance industry making up 24% of the country's total market capitalization.

Indonesia and Thailand have both experienced considerable variations during the 1990s in the value of their Herfindahl indices. Indonesia has on average the highest degree of industry based concentration of any East Asian equity market. This is not surprising given that the manufacturing sector within Indonesia averages 57% of the entire market capitalization throughout the 1990s. From January 1990 to December 1996 the manufacturing sector constituted 60%. Financial stocks had the second largest capitalization accounting for just over 15% of the market's total capitalization. Finally, the transportation industry made up a meager 5% of the market's capitalization on average during those years. The picture is completely different between January 1996 and December 1996. Both the manufacturing and finance sectors gave ground to transportation stocks. Between December 1995 and January 1996 the transportation industry had increased its sector weight from 10% to 31%. From January 1996 to December 1996 this sector's weight averaged 31% of Indonesia's total market capitalization. Manufacturing remained in the lead commanding 50%, while the finance industry took a back seat to the transport stocks with only a 9% share of the market's total capitalization.

Panel B in Table 3 re-examines the liquidity within each market by focusing on turnover ratio within each of 8 pre-specified industrial groups. The individual elements within this table represent the time series averages of each industry's turnover ratio. With the exception of Taiwan we notice that across East Asia the liquidity within each industry is closely related to the liquidity of the market as a whole. On average 3% of Indonesian manufacturing firms' market capitalization was traded each month during the 1990s. This represents the same proportion of value traded to market capitalization of the entire IFC Indonesia index.

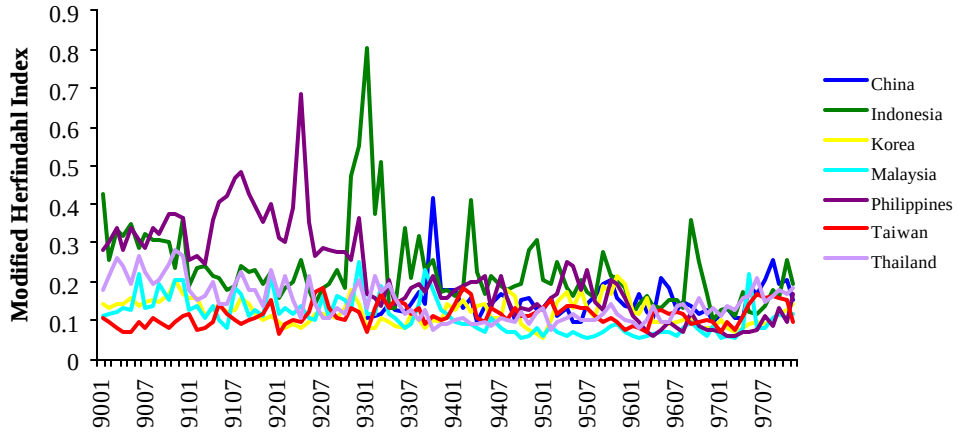
Korea, Malaysia, the Philippines, and Thailand have similar characteristics. In each of these countries the industry which commands the greatest weight in the index has a value traded to market capitalization ratio similar to the overall market's ratio. In Taiwan, we see that the agriculture and services industries exhibit the greatest degree of liquidity. On average 61% of agricultural firms' capitalization changes hands each month. For the service industries this ratio is 44%. These numbers should be treated with caution because both of the industries constitute an infinitesimal proportion of Taiwan's equity market capitalization. More importantly, we notice that the finance industry, which commands on average 36% of the Taiwan's total market capitalization, is rather illiquid compared to the liquidity of the country as a whole. On average only 9% of the finance industry's market capitalization is traded each month. Most of the liquidity reported for the overall Taiwan market comes from the high ratio of value traded to market capitalization within the manufacturing

industry. Roughly one quarter of the market capitalization of this industry changes hands each month on the Taiwan market. This is an impressive figure considering that manufacturing makes up over one half of Taiwan's market capitalization as measured by the IFC Taiwan index.

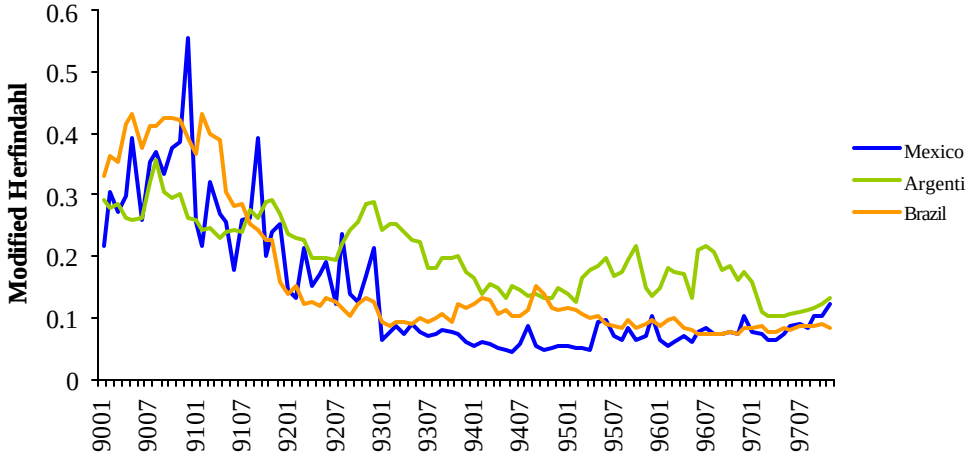
While the stocks in some industries tend to be more liquid than other stocks, overall the high degree of liquidity of Asian stock markets is not driven by a small number of highly liquid stocks. Figure 14 presents the time series of a modified Herfindahl index constructed using the value traded of each firm in the IFCG indices. This modified index is designed to measure the concentration of liquidity across individual stocks. If the total value traded is highly influenced by the value traded of one particular stock, the index value converges to one. Conversely, if the total value traded is distributed across all the stock in the index, the value of the modified Herfindahl index converges to zero.

Table 14: Modified Herfindahl of Value Traded

Panel A: East Asian Countries



Panel B: Latin American Countries



Note: Modified Herfindahl created using IFC value traded data for individual stocks.

We find that the value traded in Asian stock markets was not heavily concentrated in certain key issues. In the two most heavily traded markets in Asia, China and Taiwan, the average value of our modified Herfindahl index was .15 and .11 respectively between 1990 and 1996. The Korea and Malaysian stock markets' value traded concentration indices averaged .11 over the same period. Both Indonesia and the Philippines recorded the highest level of value traded concentration in Asia. The value traded concentration indices for these two countries averaged .24 during the 1990s. It is interesting to note, that during 1993 almost 100% of the value traded in the Indonesia IFCG index resulted from the trading of one firm. The same degree of concentration occurs in 1992 in the Philippines.

The value traded in Asian equity markets tended to be less concentrated than that of Latin America. In fact, the value traded in China, Korea, Malaysia, and Taiwan was less heavily concentrated than any market in Latin America. The average concentration index across all seven Asian markets averaged .16 during the 1990s. The average concentration index across Argentina, Brazil, and Mexico averaged .18 during the same time period.

IV.C The Effects of Asian Stock Market Concentration

Countries that exhibit a high degree of industry concentration and asset concentration may have very little cross sectional variation in the returns of the firms within the country. Consider for example Thailand. Given that 50% of the Thai equity market capitalization is finance-oriented we might expect that interest rates movements affecting finance stocks would have a disproportionate impact on the Thai IFC index. In the case of Indonesia, Korea, and Taiwan we might expect that shocks to the manufacturing sector would have significant influence on their country level indices.

One measure of the degree to which stocks in country level indices move together can be constructed by forming the ratio of the number of stocks that experience a price appreciation over the past month to the total number of stocks in the index. We present a more general measure by changing the numerator to include the maximum of either the number of stocks moving up or down during the previous month.

For the region as a whole, 70% of the individual stocks exhibited price movements in the same direction each month. These common movements could be driven by industry level shocks. In the market overview section of the IFCs Monthly Emerging Stock Markets Review, many of the Asian market movements are in fact rationalized by general industry wide shocks such as changes in US interest rates or microchip prices. However, the general co-movement in stock prices could also be caused by a follow-the-leader type effect, where individual stocks on the market follow the lead of the larger stocks.

Taiwan exhibited the lowest degree of cross-sectional correlation as indicated by our measure. On average, about 55% of Taiwanese companies move in the same direction each month. The Philippines and Thailand had similar levels of co-movement within their country level indices. Between 70% to 80% of the companies in each country moved in the same direction each month.

Stocks in Indonesia and Korea exhibited significant amounts of co-movement. Roughly 90% of the companies listed in the IFC Korea and Indonesia indices moved in the same direction each month. The IFC index for Malaysia exhibited the highest degree of co-movement among its constituents. Throughout the 1990s, greater than 95% of the stocks that made up the IFC index for Malaysia moved in the same direction each month.

V. EAST ASIAN CAPITAL MARKET PERFORMANCE

The return performance of East Asian stock markets varied across countries. In some countries investors were rewarded with outstanding returns up until the crisis. However, in other markets the return performance failed to exceed less risky positions in more developed markets. Throughout Asia, the return performance of individual markets deteriorated well before the onslaught of the financial crisis.

V.A Buy and Hold Strategy Performance

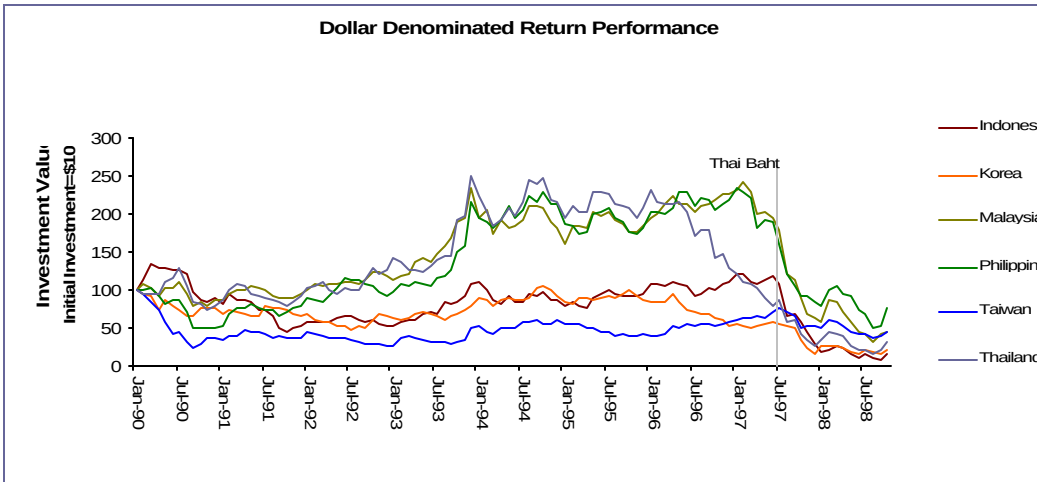
The buy and hold returns accruing to investors between January 1990 and December 1996 are presented in Panel A of Table 4. Only Malaysia and the Philippines outperformed the MSCI World index return over this period. During the same time frame, the US MSCI index outperformed all of Asia. Moreover, Asian equity returns exhibited significantly higher return volatility than the US-based returns.

Table 4: East Asian Stock Market Performance

Panel A: Log Return Summary Statistics

	Pre-Crisis *January 1990 to December 1996*			**Crisis** *January 1997 to December 1997*			Full Sample *01/90 to 12/97*
	Buy and Hold	Average Annualized Monthly Return	Annualized Standard Deviation	Buy and Hold	Average Annualized Monthly Return	Annualized Standard Deviation	Buy and Hold
Indonesia	11.10%	3.09%	103.55%	-76.19%	-135.32%	239.40%	-71.29%
Korea	-47.33%	-9.52%	95.47%	-72.79%	-118.38%	199.69%	-83.88%
Malaysia	127.13%	11.80%	85.02%	-70.20%	-128.43%	153.99%	-37.12%
Philppines	118.13%	9.55%	109.07%	-65.07%	-97.62%	125.82%	-17.82%
Taiwan	-42.89%	-4.26%	151.92%	-12.03%	-8.64%	113.85%	-47.61%
Thailand	29.56%	3.12%	111.48%	-78.63%	-160.80%	183.33%	-74.05%
United States	184.14%	13.96%	39.76%	25.47%	29.33%	55.94%	280.99%
World	78.55%	7.60%	46.20%	14.82%	15.04%	49.64%	107.52%

Panel B: Portfolio Returns During the 1990s



If we include the performance of the Asian indices subsequent to the events in 1997, their return performance is significantly degraded. The returns accruing to buy and hold strategies between January 1990 and December 1997 are negative for all of the Asian indices. Investors lost a minimum of 17% in dollar terms over the period and a maximum of 83%. Including the crisis period increases the return volatility for each of the Asian indices with the exception of Taiwan.

Between January 1997 and December 1997, all of the Asian economies experienced dramatic declines in share prices. Taiwan experienced the highest absolute dollar return. Investors in this market only lost 12% on their dollar denominated portfolios. Investors in the rest of Asia were not as fortunate. Indonesia, Korea, Malaysia, the Philippines, and Thailand suffered tremendous market losses during the crisis. Each of these markets lost at least 70% of its market capitalization in dollar terms. Moreover, the return volatility more than doubled in Indonesia and Korea during the crisis.

V.B Return Performance of Dynamic Trading Strategies

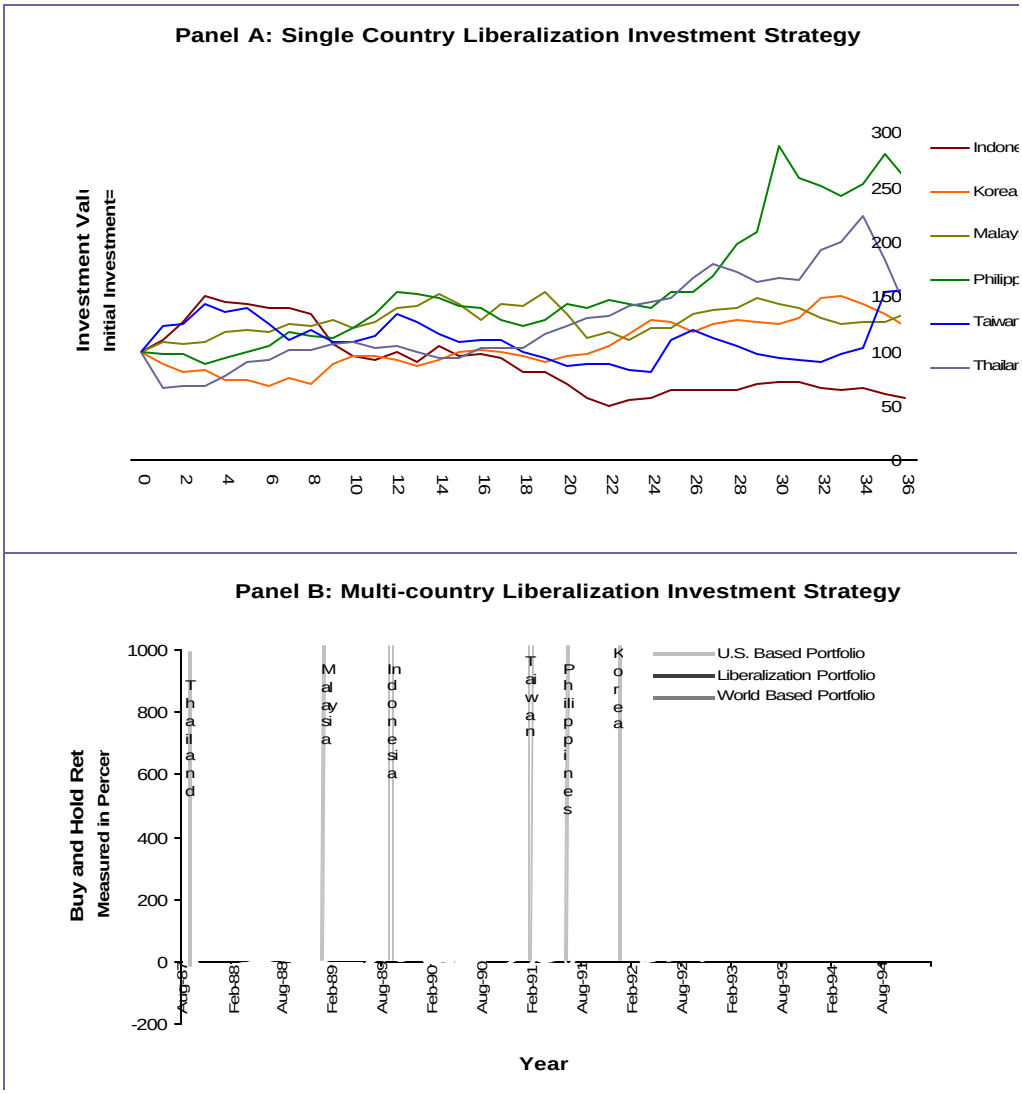
The returns presented in Panel A of Table 4 represent naïve buy and hold strategies. An investor more eager to participate in the region could choose a dynamic trading strategy to enhance his overall portfolio performance. One such strategy might capitalize on each economy's financial market liberalization. Consider, for example, the returns accruing to an investment of $100 dollars placed into each market upon that market's liberalization and liquidated three years after liberalization.

Panel A of Figure 15 presents the dollar denominated returns accruing to this investment strategy. In six scenarios presented only one, the Philippines liberalization investment strategy, rewarded the investor with significant returns. In fact, a $100 dollar investment held in the Philippines stock market for the three years following its official liberalization experienced a total return of just over 150%. We should not be surprised by this return, however, given that the unconditional return for the Philippines between 1990 and 1996 was roughly 115%.

The remaining investment portfolios in Panel A of Figure 15 experienced varying degrees of success in terms of their buy and hold returns. The liberalization portfolios for Korea, Malaysia, Taiwan, and Thailand handed in buy and hold returns under 50% for the three years following their liberalizations. Investors attempting to capitalize on the Indonesia liberalization, on the other hand, lost almost 50% of their initial investment in the three years following liberalization.

Investors need not be limited to forming single country portfolios. Another dynamic trading strategy designed to maximize an investors exposure to the region consists of investing $100 dollars into each Asian market upon its liberalization data and maintaining that investment. The combined returns to this portfolio of investments can be compared to a dollar-cost averaging strategy of investing in $100 dollar increments into the U.S. market over time. We define the regional East Asian portfolio as the Liberalization Portfolio. The dollar-cost averaging portfolio is labeled dollar-cost U.S. Both of these investment returns are presented in Panel B of Figure 15. The buy and hold return for the liberalization portfolio is dominated by the return on the US based portfolio. The dynamic portfolio growth for an initial $100 investment in the U.S. portfolio exceeds 300% over the period August 1987 to December 1995. The same measure for the liberalization is almost 800%. Note that both of these strategies involve increasing the principal invested when a country liberalizes. Importantly, the increasing investment occurs in the U.S. and liberalization portfolios at the same time. Hence, the portfolio growths are comparable.

Figure 15: Liberalization Investment Strategies



Note: Liberalization investment strategies are formed using liberalization dates presented in Bekaert and Harvey (1999) and the IFC indices. The dates on the x-axis in Panel A represent event time where 0 is the liberalization month, 1 indicates one month after liberalization, etc.

Most of the increase in the value of the liberalization portfolio occurs between the third quarter of 1993 and the first quarter of 1994. The high returns during this period are fueled in large part by the dramatic performance of Malaysia, the Philippines, and Thailand. Following this incredible bout of performance the liberalization portfolio experiences erratic and negative performance until its liquidation in December of 1995. Ignoring the substantial run up during this period, the dynamic multi-country liberalization strategy failed to outperform either the US dynamic strategy or the world based dynamic strategy.

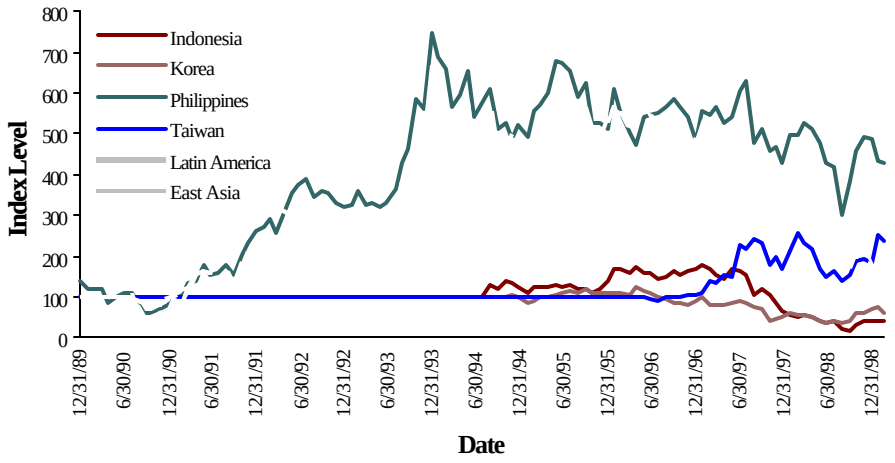
V.C Return Performance of ADRs

As mentioned previously, investors who wanted exposure to Asian markets did not need to invest their money directly into the local Asian exchanges. Many Asian firms issued depository receipts that traded on major exchanges in the US. Moreover, international investors may have preferred to invest in firms that complied with full SEC disclosure policies, rather than risking investment in firms on local exchanges where fundamental firm level information may not have been as transparent.

In order to measure the performance of Asian ADRs, we form equally weighted portfolios of Asian issued ADRs trading on either the NYSE or NASDAQ by country. The number of ADRs in each country's ADR index varies through time as the country issuance record changes. While this confuses the comparison of return performance across countries, these indices do provide investors with the real time investment performance of a portfolio designed to achieve maximum exposure to these markets.

Figure 16 displays the return performance for five Asian countries as well as two aggregated regional ADR indices. We find that the ADR index for the Philippines outperformed all other ADR indices during the 1990s. The buy and hold return of the ADR Philippine index exceeded 400% between 1990 and 1996. The ADR Indonesian index buy and hold return for the same period was roughly 69%. The Taiwan and Korean ADR indices showed weak performances during this period. For Taiwan the buy and hold return is effectively zero, whereas the buy and hold return for Korea is negative 15%.

Figure 16: ADR Investment Performance



Note: Portfolio contain all available ADRs trading on NYSE and NASDAQ for each country presented. As new ADRs enter the sample the portfolio is adjusted using equal weights to include the new ADR in the return calculation.

If we examine the regional ADR indices we find that the Asian ADR index outperforms its Latin American counterpart. The buy and hold return of the Asian ADR index exceeds 450% between 1990 and 1996. Over the same period, the buy and hold return of the Latin index was roughly 120%. However, between June 1997 and June 1998 the Asian ADR index loses more than 60% of its value.

Thus, over the broader time span from January 1990 to June 1998, the buy and hold returns on the ADR portfolios of Latin American and Asia are approximately equivalent.

VI. CORPORATE PERFORMANCE AND FINANCIAL RISK

Our discussion of Asian capital markets to this point has relied on aggregated capital market price data. We have shown that Asian capital markets experienced significant growth via new capital mobilization. Furthermore, we have provided evidence that suggests that Asian firms solicited substantial amounts of new capital from international markets. Our analysis now shifts gears and investigates the issuer side of this new capital mobility.

In this section, we will provide summary statistics describing the corporate performance record in Asia as well as the financial risk of Asian corporations. Our approach is similar in spirit that that of Pomerleano (1998) and Claessens et al. (1998). However, while these authors present descriptive statistics relating to the average or median firm level characteristic, we provide information on each characteristic's entire distribution across firms and across time. Thus, our analysis allows us to analyze not only on the average but also on the entire shape of the distribution of each fundamental firm level attribute.

Another important distinction between our analysis and that offered previously relates to our sample of firms. Pomerleano (1998), for example, collects a sample of firms from each of the Asian countries using financial data from the Financial Times Information's Extel Card database. He constrains his sample using the number of firms that have data available as of December 1992 and investigates the time series of the weighted average of certain characteristics of this group throughout the 1990s.

One issue with the constant sample approach is that it ignores new firms that enter the database and it assumes that the constant sample of firms remains the representative sample of firms throughout the investigation period. However, new firms provide additional and valuable information as to the profitability and financial position of Asian corporations in general. Ideally, we would like to incorporate this information into the analysis of corporate performance. Moreover, the constant sample approach implicitly assumes that the sample of firms maintain their relative position vis-à-vis the remaining firms in the economy. We can imagine a scenario whereby the firms chosen in 1992 are not the only firms that impact the economy in 1997. Furthermore, the average characteristics of these firms may or may not reflect the average characteristics of the rest of the firms. The deviation may be exaggerated as we move forward through time.

Our analysis will examine the distribution of firm level characteristics for all firms in the Worldscope database. As new firms enter the Worldscope database we incorporate these firms into our analysis. Table 5 presents the details of our sample. Comparing our sample to that employed by Pomerleano (1998), we find that in general our sample of firms is larger. Moreover, moving from 1992 to 1996 our sample incorporates more firms. Therefore, the marginal impact of any single firm on our reported statistics decreases as our sample increases. This may be particularly relevant to countries in which the sample size is "small". For example, as of 1992 our sample for Taiwan includes a maximum of 27 firms. The sample size of Pomerleano (1998) is 16. The marginal impact of any one firm in a sample this size is large. By including more firms into our sample, the number of firms grows to a minimum of 182 firms by 1996. Clearly, the marginal impact of any one firm on our sample statistics becomes minimal.

Table 5: Sample Description for Corporate Performance Evaluation

Panel A: Indonesia

	1992	1994	1996
ROE	126	141	188
ROIC	121	135	184
Total Debt % Common Equity	137	150	202
Interest Expense on Debt % EBITD	132	144	194
Pomerleano(1998)	122	122	122

Panel B: Korea

	1992	1994	1996
ROE	107	176	225
ROIC	103	178	228
Total Debt % Common Equity	123	213	257
Interest Expense on Debt % EBITD	47	113	253
Pomerleano(1998)	44	44	44

Panel C: Malaysia

	1992	1994	1996
ROE	159	192	293
ROIC	159	193	294
Total Debt % Common Equity	188	216	336
Interest Expense on Debt % EBITD	186	214	335
Pomerleano(1998)	211	211	211

Panel D: Philippines

	1992	1994	1996
ROE	42	66	94
ROIC	32	54	81
Total Debt % Common Equity	55	70	105
Interest Expense on Debt % EBITD	42	57	90
Pomerleano(1998)	29	29	29

Panel E: Taiwan

	1992	1994	1996
ROE	24	43	182
ROIC	23	42	183
Total Debt % Common Equity	27	105	201
Interest Expense on Debt % EBITD	26	103	199
Pomerleano(1998)	16	16	16

Panel F: Thailand

	1992	1994	1996
ROE	157	346	377
ROIC	157	350	385
Total Debt % Common Equity	261	366	417
Interest Expense on Debt % EBITD	247	356	415
Pomerleano(1998)	173	173	173

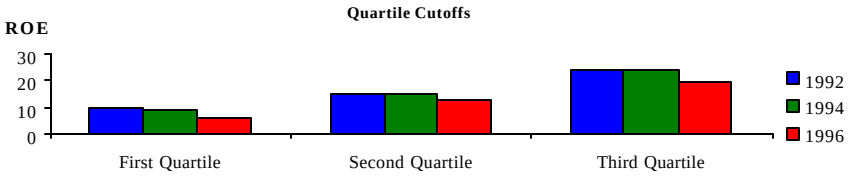
VI.A Measuring Asian Corporate Performance

Two of the more common ratios used by the literature to examine corporate performance are the rate of return on equity and the return on invested capital. Worldscope calculates the return on equity (ROE) the ratio of net income to the average value of common equity. The ROE tells common shareholders how effectively their money is being employed. Another performance indicator, the return on invested capital (ROIC), measures a firm's earnings before interest and taxes as a percentage of the total amount of capital employed. ROIC can be interpreted as providing some indication of the efficiency of capital utilization. We present a discussion each of these indicators in the section to follow.

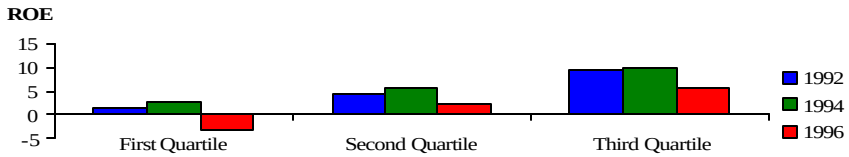
Figure 17 depicts the distribution of Asian non-financials' ROE in 1992, 1994, and 1996. Throughout our sample of countries, the median ROE decreases over the course of the 1990s. For example, in Indonesia the median ROE drops steadily falling from 15% in 1992 to 12.5% in 1996. In Thailand this pattern is more pronounced. In 1992, the median ROE of all 107 firms in our sample is 19.4%. By 1996, the median ROE in Thailand falls to 7.7%. However, in Korea, Malaysia, the Philippines, and Taiwan the change in the median ROE between 1992 and 1996 is less dramatic.

Figure 17: Return on Equity (ROE) Quartile Cutoffs

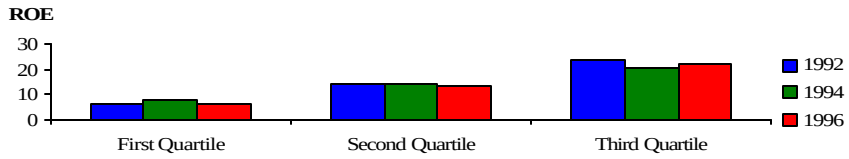
Panel A: Indonesia



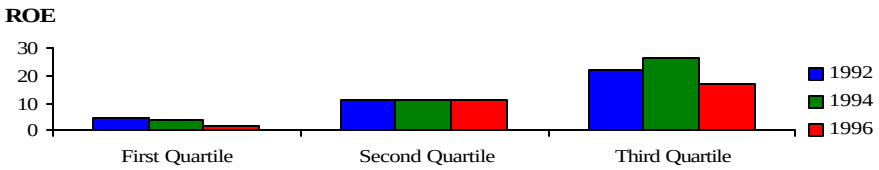
Panel B: Korea



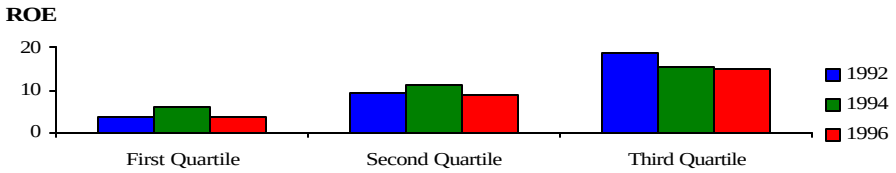
Panel C: Malaysia



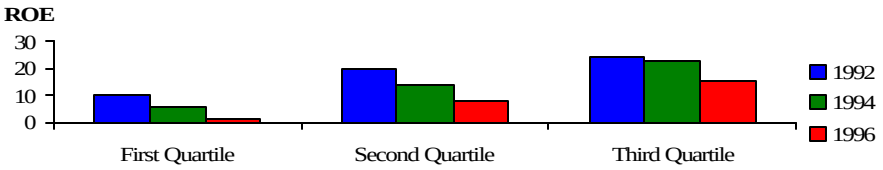
Panel D: Philippines



Panel E: Taiwan



Panel E: Thailand

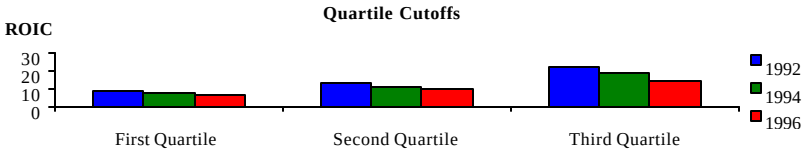


From the data in Figure 17 we also find that within certain countries the entire distribution of ROE across firms shifts to the left between 1992 and 1996. Consider the case of Thailand. The first, second, third, and fourth quartiles report a lower ROE in 1996 than in 1992. The same pattern holds across firms from Indonesia. Beginning in 1992 the 25% of Indonesian firms sample reported a return on equity less than 9.7%, 50% of firms reported a ROE less than 15.1%, and for 75% of the firms the return to equity was less than 24.3%. Four years later in 1996, the first quartile of firms recorded a ROE less than 6.4%, the second quartile listed a ROE less than 12.5%, and the ROE for the third quartile was 12.5%. These data suggest that the entire sample distribution of the ROE across firms from Indonesia shifted left.

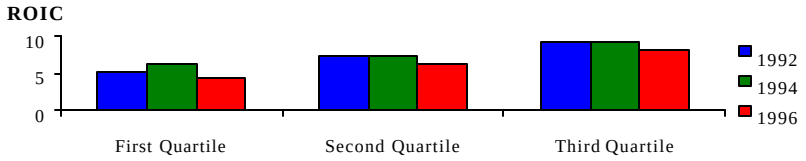
The return on invested capital provides another convenient indication of a firm's performance. Figure 18 presents the distribution of ROIC for our sample of firms across Asia. The changes in Asian ROIC during the 1990s parallel the changes in the ROE. For example, the distribution of ROIC for both Indonesia and Thailand exhibits a significant shift to the left between 1992 and 1996. This shift indicates that Indonesian and Thai firms made less efficient use of their capital base as the 1990s progressed. In fact, the median ROIC in Thailand fell from 12.5% in 1992 to 6.7% in 1996. This decrease in the ROIC is similar to that documented in Pomerleano (1998). The change in the ROIC in Korea, Malaysia, the Philippines, and Taiwan was not as noticeable as it was Indonesia and Thailand.

Figure 18: Return on Invested Capital (ROIC) Quartile Cutoffs

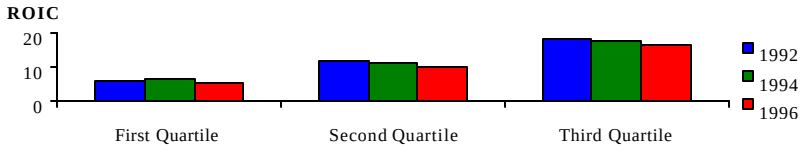
Panel A: Indonesia



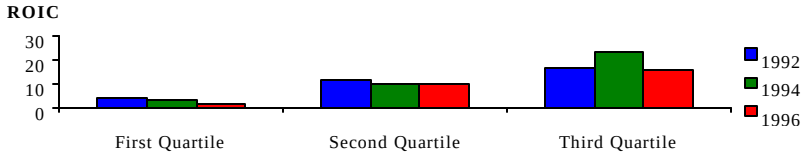
Panel B: Korea



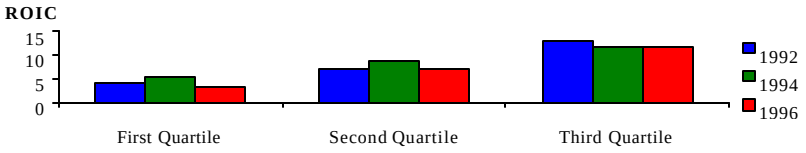
Panel C: Malaysia



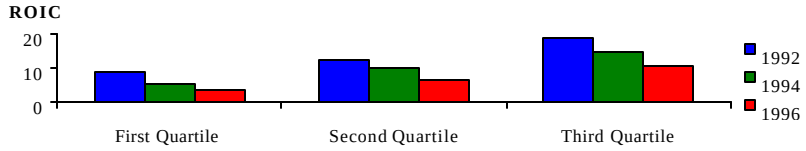
Panel D: Philippines



Panel E: Taiwan



Panel F: Thailand

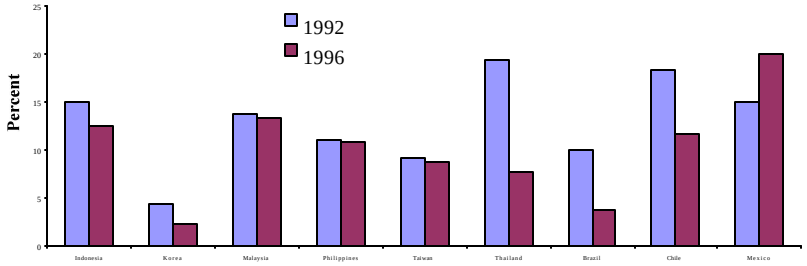


In general corporate performance indicators deteriorated throughout emerging markets during the 1990s. Figures 19 details the median ROE and ROIC for various emerging markets. Both the median ROE and the median ROIC fell for most emerging markets presented between 1992 and 1996. The only country whose firms increased their profitability measures was Mexico. Not only did Mexican firms increase their ROE and ROIC between 1992 and 1996, they also had the highest level of these

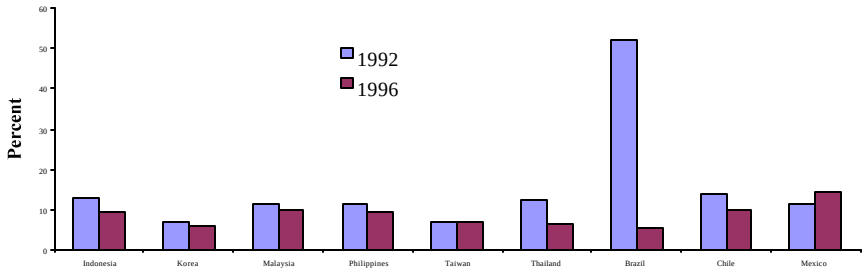
performance indicators across our sample of emerging markets. In the other Latin American markets, the record of corporate performance was similar to Asia. Both Brazilian and Chilean firms reported a lower ROE and ROIC in 1996 than they had reported in 1992.

Figure 19: Cross Sectional Changes in Median of Corporate Performance Indicators

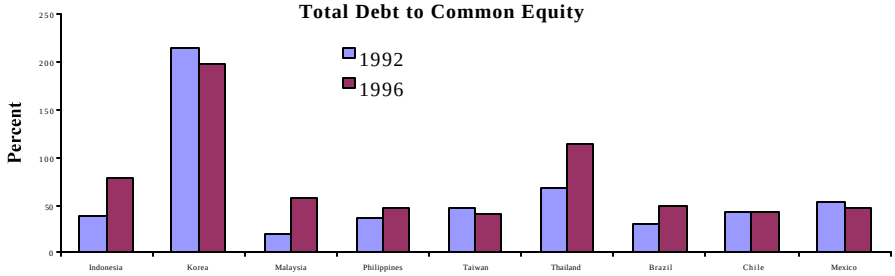
Panel A: Return on Equity



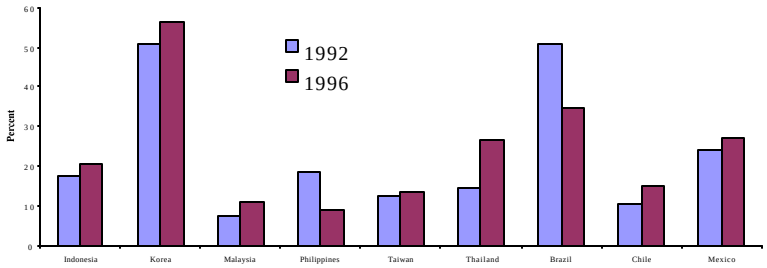
Panel B: Return on Invested Capital



Panel C: Total Debt to Common Equity



Panel D: Interest Payments to EBITD



VI.B Measuring Financial Risk

A firm's leverage ratio, total book value of debt to book value of common equity, can be interpreted as providing evidence of the amount of financial risk affecting stock holders. As stockholders are the residual claimants to a firm's cash flow after debt is paid, high leverage ratios imply significant financial risk. Another measure which attempts to ascertain the financial risk borne by equity holders is the ratio of earnings before interest and taxes plus depreciation and amortization (EBITDA) to interest payments. Low EBITDA to interest payment ratios indicate firms with high financial risk. In the analysis to follow, we examine these various indicators of financial risk through time and across Asian countries.

Figure 20 presents the distribution of leverage ratios through time for our sample of Asian countries. With the exception of Korea and Taiwan, all of the Asian countries represented exhibited a higher median ratio of total debt to common equity in 1996 than in 1992. The change in leverage was most noticeable in Thailand. In 1992 the median leverage ratio across the 261 firms in Worldscope was 68.6%. By 1996 the median firm's leverage ratio had almost double to 114%. In Indonesia, the median firm doubled its leverage ratio between 1992 and 1996. Leverage for the median Indonesia firm increased from 39% to 78%. While the median firm in Korea actually managed to decrease its leverage ratio, the financial risk across all Korean firms was substantially higher compared to other Asian firms. In fact, only 25% of all Korean firms had leverage ratios less than 132% in 1992. By 1996 75% of the 257 non-financial Korean firms in our sample shared leverage ratios in excess of 97%.

Moreover, the entire distribution of leverage ratios shifts to the right for most Asian countries. This shift indicates that most firms, and not just the median firm, increased their leverage ratios between 1992 and 1996. For example in Malaysia, 25% of firms in 1992 had leveraged 2.1% of their common equity, 50% of firms reported a leverage ratio of 18.9% or less, finally 75% of the firms in Malaysia stated their leverage ratio was less than 50%. By 1996 the values for the first quartile, second quartile, and third quartile increased to 12%, 58%, and 112% respectively. The distribution of leverage ratios for firms in Indonesia, the Philippines, and Thailand also showed this marked shift to the right.

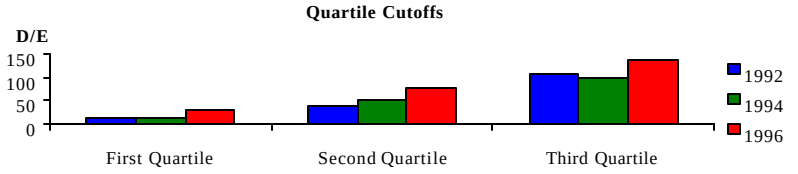
The increase in the leverage ratio indicated that Asian equity holders faced the burden of growing financial risk to their investment. In order to appreciate this financial risk, we examine the ability of Asian firms to service their existing debt obligations. The ratio of interest paid to EBITDA indicates how much of the firm's cash flow is used to service the interest portion of its outstanding debt. Since equity holders are the residual owners to this cash flow, an increase in the ratio of interest payment to EBITDA indicates lower plow back and or dividends.

In Figure 21 we present the distribution of the ratio of interest paid to EBITDA across firms for various countries in Asia. In Indonesia, Korea, Malaysia, Taiwan, and Thailand the value of this ratio increased between 1992 and 1996. Consider Thailand as an example. In Thailand the median ratio of interest paid to EBITDA increased from 14.5% to 26.4% in just four years. By the end of 1996, up to one quarter of the earnings of one half of the firms in Thailand went towards paying interest on their outstanding debt. For 25% of the firms in Thailand in 1996, between 25% and almost 50% of their earnings was dedicated to paying interest alone.

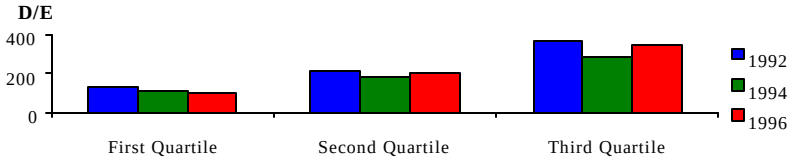
While this may seem high, Thailand was not the most heavily indebted country in Asia. Recall from Figure 20 that Korean leverage ratios were nearly double those of Thailand during the 1990s. In fact, in 1996 roughly 25% of the firms in Korea dedicated between 50% and 75% of their earnings to pay off the interest on their debt.

Figure 20: Debt to Equity Ratios Across Countries

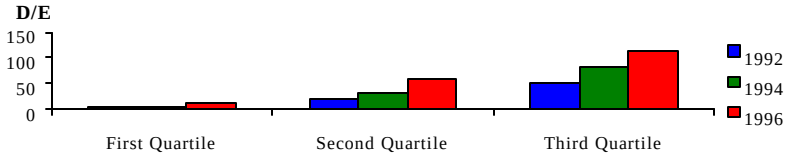
Panel A: Indonesia



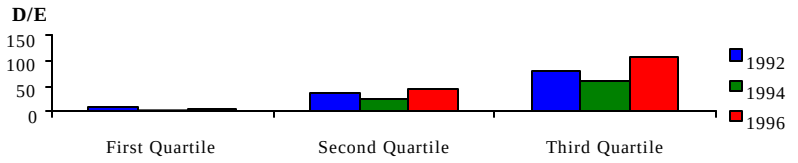
Panel B: Korea



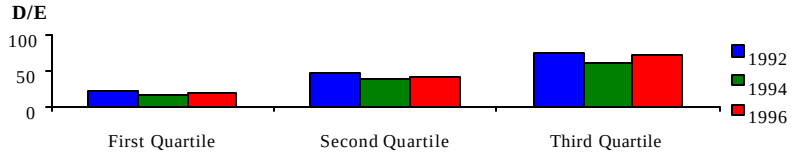
Panel C: Malaysia



Panel D: Philippines



Panel E: Taiwan



Panel F: Thailand

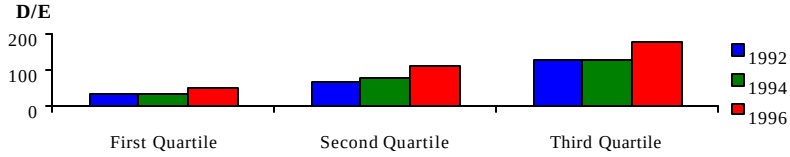
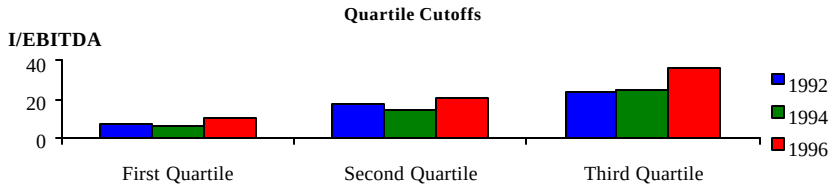
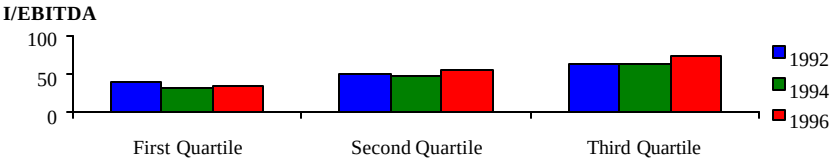


Figure 21: Interest Payment to EBITDA Ratios Across Countries

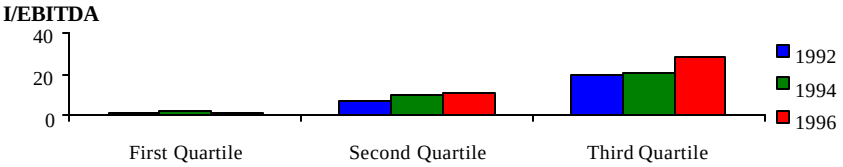
Panel A: Indonesia



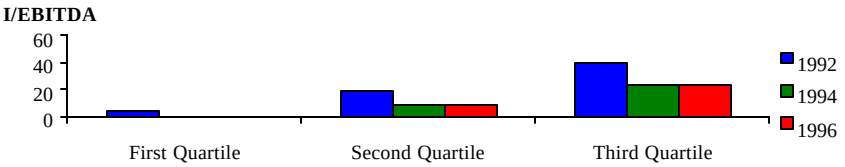
Panel B: Korea



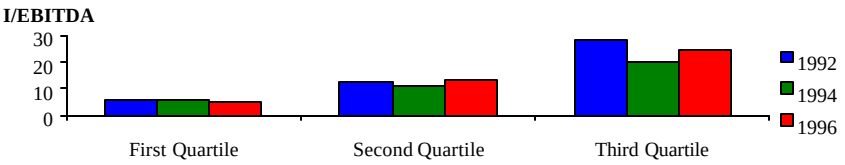
Panel C: Malaysia



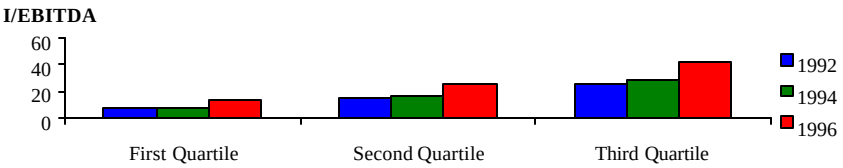
Panel D: Philippines



Panel E: Taiwan



Panel F: Thailand



VII. Common Characteristics Among Asian Issuers

The previous section highlighted the increasing financial risk of Asian corporations. We found that throughout the region firms increasingly leveraged their firms' balance sheets. Furthermore, the amount of earnings dedicated to interest service on this debt increased to very high levels. In Thailand, for example, corporations dedicated on average 25% of their cash flow to servicing the interest payments on their debt obligations. Moreover, in Thailand, the general profitability of corporations deteriorated during the latter half of the 1990s.

Increasing leverage and decreasing profits are key determinants of default risk. In order to determine whether or not international capital markets helped to contribute to this recipe for disaster, we examine the characteristics of Asian Eurobond issuing firms. If international capital markets ignored Asia's increasing vulnerability and haphazardly issued capital, we would expect Asian Eurobond issuers would have firm level characteristics similar to the average firm level characteristics of the entire region. However, provided that international capital markets rationed their capital investments we would expect that only the most promising firms would receive funding from the Eurobond market.

In the section to follow we explore average firm level characteristics of Eurobond issuing firms from Korea and Thailand. We compare these firms to the distribution of firms from the previous section in order to determine whether or not international capital markets provided capital on a systematic basis. Our results suggest that the Eurobond market allocated new capital to the most highly profitable firms from Thailand. However, the typical Eurobond issuing firm from Korea and Thailand was also more highly leveraged than the average firm from each of these countries.

VII.A Eurobonds and Firm Level Attributes: Korea and Thailand

We use data from the Worldscope database to construct average rates of profitability and leverage for the subset of Korea and Thailand firms participating in the Eurobond market. We then compare Eurobond issuing firm level averages to the distribution of firm level averages presented in the previous section. Our sample of firms includes the intersection of firms in the Bondware and the Worldscope databases.

In Korea, our sample includes 48 firms. Panel A of Table 6 lists these firms. Twenty-eight of the 48 firms are non-financial firms. The average ROIC across the 34 non-financial Eurobond issuing firms was 6.27% in 1996. This average was roughly in line with the median ROIC across all non-financial Korean firms in 1996 reported in Figure 18. However, 15 of the Eurobond issuing Korean firms reported ROIC in excess of the median across all non-financials. The average of ROIC on this sub sample was roughly 2.5 percentage points above the median ROIC. Moreover, 6 of the 34 Eurobond issuing non-financial firms experienced a ROIC greater than 75% of all other non-financial Korean firms.

In Thailand, see Panel B of Table 6, Eurobond issuing firms experienced similar high ROIC relative to the broader sample of non-financial Thai firms. Our sample of Eurobond issuing firms from Thailand includes 20 firms. Half of these firms are non-financial firms. We find that for the non-financial Thai firms the average ROIC in 1996 was 9.77%. Comparing this figure to the distribution of ROIC across all non-financial firms in Thailand presented in Figure 18, we find that Eurobond issuing firms from Thailand tended to have a ROIC representative of the third quartile of the distribution of ROIC. In fact, 4 of the 10 Eurobond issuing firms in our sample handed in ROIC figures placing them in the top 25% of all firms in Korea. The median non-financial Thailand firm

experienced a ROIC of 6.7%. Only 2 of the 10 Eurobond issuing firms in sample experienced a ROIC below this amount.

Table 6: Select Asian Issuers in the International Bond Market

Panel A: Korea

Company Number	*Company Name*	*Industry*	1996 *Total Debt % Common Equity*	1996 *ROE*	1996 *ROIC*
1	Dacom Corp	TC	87.94	4.66	5.69
2	Daewoo Electronics Co Ltd	EC	342.17	9.51	9.69
3	Daewoo Heavy Industries Ltd	IC	175.88	1.15	4.25
4	Daewoo Telecom Ltd	TC	163.44	3.77	7.33
5	Dong Ah Construction Industrial Co Ltd	CN	298.48	-0.97	5.32
6	Hankook Tire Manufacturing Co Ltd	RP	268.44	3.22	6.93
7	Hansol Paper Co Ltd	FP	323.61	4.51	7.28
8	Hyundai Electronics Industries Co Ltd	EC	574.64	NA	NA
9	Hyundai Engineering & Construction Co Ltd	CN	573.15	1.90	6.33
10	Hyundai Motor Co	AM	253.17	2.84	8.23
11	Jinro Ltd	FD	1723.66	NA	5.10
12	Kangwon Industries Ltd	IS	308.57	-2.28	6.61
13	Kia Motors Corp	AM	353.63	-3.50	4.81
14	Kia Steel Co Ltd	IS	2293.88	-70.97	-3.02
15	Kolon Industries Inc	CM	241.47	4.03	NA
16	Kolon International Corp	CM	352.58	-0.90	7.36
17	Korea Electric Power Corp	EU	74.36	5.11	5.40
18	Korea Green Cross Corp	HC	117.33	6.16	7.19
19	LG Industrial Systems Co Ltd	IC	323.94	3.89	8.37
20	LG Semicon Co Ltd	EC	227.12	NA	NA
21	Medison Co Ltd	EC	74.13	22.79	18.57
22	Miwon Co Ltd	FD	1013.09	-31.90	1.71
23	Oriental Chemical Industries	CM	115.19	14.42	11.15
24	Pohang Iron & Steel Co Ltd	IS	95.66	9.78	7.94
25	Poongsan Corp	MO	406.63	-4.92	3.45
26	Samsung Co Ltd	TD	386.20	4.09	5.27
27	Samsung Corp	IC	386.20	4.09	5.27
28	Samsung Electronics Co Ltd	EC	296.12	1.90	3.78
29	Samwhan Corp	CN	216.25	2.73	6.55
30	SsangYong Cement Industrial Co Ltd	CN	221.85	1.43	4.85
31	SsangYong Oil Refining Co Ltd	OG	187.41	3.22	3.80
32	STC Corp	MN	695.59	-13.85	4.40
33	Tong Yang Cement Corp	CN	323.48	-3.12	4.35
34	Trigem Computer Inc	CS	145.83	5.90	10.52
	Non Financials (non-realestate) Sample Average		401.21	-0.36	6.27
35	Boram Bank	BF	133.95	-3.51	3.93
36	Cho Hung Bank	BF	450.70	6.24	NA
37	Commercial Bank of Korea Ltd	BF	388.14	6.90	NA
38	Hana Bank	BF	315.44	10.46	NA
39	Housing & Commercial Bank	BF	121.99	NA	NA
40	Kookmin Bank	BF	515.43	17.39	NA
41	KorAm Bank	BF	354.81	7.80	NA
42	Korea Exchange Bank	BF	725.02	5.52	NA
43	Korea First Bank	BF	535.61	-2.07	NA
44	Korea Long Term Credit Bank	BF	1253.06	9.31	6.79
45	Kwangju Bank Ltd	BF	410.28	2.03	NA
46	Kyungki Bank Ltd	BF	300.72	1.23	NA
47	Pusan Bank	BF	557.05	10.23	NA
48	Shinhan Bank	BF	364.33	7.62	NA
	Financials and Real Estate Firms' Sample Average		459.04	6.09	5.36

Panel B: Thailand

Company Number	Company Name	Industry	1996 Total Debt % Common Equity	1996 ROE	1996 ROIC
1	Banpu Public Co Ltd	OG	163.13	18.47	8.37
2	Loxley Public Co Ltd	TC	220.62	15.22	11.37
3	Precious Shipping Public Co Ltd	TS	266.70	15.41	7.72
4	PTT Exploration & Production Public Co Ltd	OG	85.53	9.21	8.03
5	Robinson Department Store Public Co Ltd	RC	148.47	10.52	7.63
6	Srithai Superware Public Co Ltd	RP	185.83	21.36	12.11
7	Thai Central Chemical Public Co Ltd	AG	189.39	5.27	4.43
8	Tipco Asphalt Co Ltd	PW	143.97	32.08	18.57
9	Total Access Communications Public Co Ltd	TC	155.88	17.60	14.76
10	TPI Polene Public Co Ltd	CM	323.84	7.65	4.75
	Non Financials (non-realestate) Sample Average		188.34	15.28	9.77
11	Advance Agro Public Co Ltd	FP	264.92	-16.79	-4.45
12	Cogeneration Public Co Ltd	EU	120.01	NA	NA
13	Central Pattana Public Co Ltd	RE	101.17	NA	NA
14	Hemaraj Land and Development Public Co Ltd	RE	118.76	20.06	11.38
15	Juldis Develop Public Co Ltd	RE	229.75	0.64	1.97
16	Land & Houses Public Co Ltd	RE	139.41	12.08	6.73
17	MDX Public Co Ltd	RE	82.33	-5.50	0.53
18	One Holding Public Co Ltd	BF	273.15	-6.03	3.12
19	Property Perfect Public Co Ltd	RE	220.02	10.48	3.45
20	Tanayong Public Co Ltd	RE	125.93	3.21	1.75
	Financials and Real Estate Firms' Sample Average		167.55	2.27	3.06

While the previous evidence suggests that Eurobond issuing firms in Korea and Thailand tended to be the most profitable, Table 6 also suggests that these firms were the most highly leveraged firms in these countries. In fact roughly 70% of the Eurobond issuing firms from Korea recorded leverage ratios in 1996 greater than the median leverage of all non-financial firms from Korea. The average leverage ratio across the sample of non-financial Eurobond issuing firms in 1996 was 401%. Comparing this to the distribution of leverage ratios from Figure 20, we find that the average Eurobond issuing non-financial Korean firm had a higher leverage ratio than 75% of the rest of the non-financial firms in the Korean economy.

Once again, Thailand's Eurobond issuing non-financials displayed the same pattern of high leverage relative to the rest of the economy. In fact, 5 out of the 10 Eurobond issuing firms from Thailand had leverage ratios greater than 75% of the rest of all non-financial firms in Thailand. In fact, the average leverage ratio across the sample of Eurobond issuing firms was 182% in 1996. Only one Eurobond issuing firm from Thailand reported a leverage ratio less than the median leverage ratio across all non-financial firms from Thailand.

VII.B Value at Risk: The Next Logical Step

The combination of the firm level characteristics of Eurobond issuing firms presented above suggests that international capital markets allocated capital to the most profitable yet highly levered firms in Asia. This pattern of allocation can be consistent with a rationally functioning capital market provided that the markets correctly account for the financial risk of these firms. Assuming that this risk was priced into either bond yields or expected stock returns, it appears as though Asian

corporate managers levered up their investments in an attempt to "bet" on the long run performance of their firms.

We use the term "bet" for a number of reasons. First, corporate managers increased leverage in a period of declining corporate performance. Second, corporate managers increased the stake by using foreign currency denominated debt. In this case, the "bet" covers both the firm's prospects as well as the direction of the country's exchange rate.

The substantial foreign exchange exposure is difficult to quantify with standard methods. For example, standard risk analysis would regress stock returns on the foreign exchange rate change. In many of our sample countries, the exchange rate was effectively fixed. The statistical measure of risk would suggest no significant exchange rate exposure.

Current research by Harvey and Roper (1999) attempts to provide a systematic approach to measuring the risk inherent in funding projects with foreign denominated debt. Exposure is measured from the bottom up by looking at the firm's loan portfolio and the currency denomination and simulating exchange rate scenarios. A Value at Risk exercise can then be conducted.

Value at Risk (VaR) has become a popular measure in the banking sector as a way of examining the impact various scenarios on a banks capital adequacy ratio. While non-financial institutions do not have legal capital adequacy requirements, VaR can serve as a useful tool to measure fluctuations in the financial risk of a firm brought about by changes in interest rate environments and exchange rate changes.

The VaR analysis in Harvey and Roper (1999) focuses on the VaR of dollar denominated Eurobonds and foreign bank loans. The first step of the exercise includes forming the Eurobond debt servicing obligations and international bank loan servicing obligations of Asian corporations on a firm by firm basis. They use Euromoney's Bondware and Loanware databases to collect information on the coupon, principal, issue date, maturity date, and currency of denomination for every Asian corporate debt obligation listed in the international marketplace.

In order to determine the VaR of Asian firms, Harvey and Roper (1999) normalize the Eurobond and other debt service obligations of each company by their EBITDA. This tells us much of a firm's cash flow goes towards servicing total debt and the foreign currency denominated component.

The idea of the VaR exercise is to fix a reference point prior to the crisis and to project into the future different scenarios for the exchange rate. Harvey and Roper (1999) compare the ratio of Eurobond debt servicing obligations to EBITDA across countries and firms in order to assess the Value at Risk of Asian corporations. They are able to assess how much of a currency depreciation would wipe out all cash flows. Using the information about inter-firm correlations, they are able to estimate the impact of various levels of currency depreciation on the entire corporate sector. Indeed, the VaR analysis provides the basis for a type of emerging market early warning system. This analysis contrasts with the standard approaches that rely on historical movements in exchange rates.

VIII. CONCLUSIONS

Our quantitative and qualitative assessment of Asian capital markets has revealed several common features across the individual markets throughout the region. In general, a substantial part of growth in market capitalization associated with the markets during the 1990s resulted from new capital mobilization of equity and debt. Compared to local capital markets in Latin America, East Asia was more successful in terms of new share issuance, IPOs, and new bond issuance. Moreover, the degree of liquidity offered to investors in the secondary markets for these securities was higher than that of Latin American. In fact, the liquidity in China, Taiwan, and Malaysia rivals the liquidity offered in the US.

We also found similar forms of concentration across East Asian stock exchanges throughout the 1990s. In general, the various stock exchanges tended to be heavily concentrated in certain industries. Moreover, the asset concentration of East Asian stock markets was higher than that of Latin America. The impact of asset concentration manifested itself in high correlation among individual stock returns. We show that most of the individual stocks in Asia moved up or down together throughout the 1990s. However, we also found that the concentration of value traded in secondary markets in Asia was more evenly distributed among firms than the levels found in Latin America.

Despite East Asia's success at new capital mobilization and East Asia's high degree of liquidity, the return performance for different types of portfolio investments in this region lagged behind the rest of the world. One exception to this poor performance record was a dynamic trading strategy designed to capture the price appreciation associated with market liberalization. Another exception was the return to an investment in Philippine issued ADRs that proved extremely profitable up until 1996. In general, Asia's capital market liberalization programs had little impact on the volatility of local stock market returns. In fact, most of the changes in volatility process and return processes that occurred during the 1990s resulted from changes in the underlying economic and financial market fundamentals of each country.

Our firm level analysis suggests that Asian corporate performance indicators soured during the later half of the 1990s while leverage ratio increased. While any equity investment carries a certain degree of risk, this combination increased the financial risk of Asian corporations.

We also analyze the type of debt. In a case study of Korean and Thai firms who participated in the Eurobond market, we find that their ROIC is high compared to the rest of the firms in these markets. But these are also the firms that had the highest pre-existing levels of leverage.

It has been routine to "point fingers" and assign blame for the Asian crisis. Foreign speculators and the structural characteristics of both local and international capital markets have taken a lot of flack. However, foreign speculators were not advising East Asian corporations to increase their leverage in a period of declining financial performance. Speculators did not advise corporations to issue foreign currency denominated debt.

Our research focuses on a micro-level interpretation. Asian corporate managers "bet" their firms when they increased leverage in the face of lower corporate performance. They raised the stakes by issuing foreign currency denominated debt. Here, they were betting that the exchange rates would remain fixed for an indefinite amount of time.
The research of Harvey and Roper (1999) attempts to quantify this bet in terms of Value at Risk analysis.

While the causes of the Asian crisis are complex, our micro-level analysis suggests that individual firms greatly increased their risk exposure. Given the characteristics of the economy that guaranteed high correlation among these firms, this set the stage for the following possibility. A shock to the economy could have a greatly magnified and a potentially catastrophic effect because of the high-risk exposure induced by corporate managers. While Asian corporate managers did not initiate the crisis, their deficiencies in standard risk management practices greatly exacerbated the crisis. The decline of many corporations can be directly tied to a failure in corporate governance with respect to risk management and control.

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