

Capital Market Liberalization and Financial Crises: The Case of Asia

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Abstract

In a number of developing countries, capital market liberalization appears to have been associated with costly financial crises. This paper examines how capital market liberalization can cause financial crises by negatively affecting domestic fundamentals and by facilitating contagion. Data of the Asian Crisis countries show that even though the fundamentals worsened after the capital market liberalization (real appreciation and current account deficits), other factors such as world price shocks are also responsible for weakening fundamentals. Cross-country correlations of macroeconomic variables demonstrate that the possibility of contagion increases as these countries open their capital markets, but only slightly. Finally, we compare the Asian Crisis with the European Crisis in 1992, testing for any common features in the degree of capital market liberalization at the time of crisis. All these results lead to the conclusion that there is no evidence that capital market liberalization directly causes financial crises.

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1. Introduction

The amount of international capital flows has steadily increased in the past few decades. Many emerging economies reduce statutory restrictions on international capital flows and distortions in domestic markets to capture the benefits of capital inflows. However, in a significant number of cases, financial liberalization seems to be associated with financial crises. If financial liberalization is responsible for financial crises and the costs of crises exceed the benefits of liberalization, countries have no incentive to open their capital markets. On the other hand, if the relationship between liberalization and crises is spurious, then capital market liberalization should be pursued irrespective of any impediments on the way.

Understanding the relationship between capital market liberalization and financial crises is crucial in implementing and sequencing various steps of internal and external liberalization and other related policies. Despite its importance, especially considering the costs associated with crises and the inevitability of liberalization, there have not been enough studies on this issue.¹ This paper takes on this issue and examines channels through which capital market liberalization can cause financial crises by investigating data from various crises in the 1990s, particularly the Asian Crisis of 1997.

Two main theories have emerged to explain the causes of the Asian crisis. One group argues that crises are due to problems in domestic fundamentals, while the other group claims that the magnitude of crisis can be explained only by investors' panic and financial contagion.² Following these studies, we separately analyze the effects of capital market liberalization on domestic fundamentals and contagion.

Empirical tests of the relationship between capital account liberalization and financial crises are challenging due to the difficulty of separating the effects of capital account liberalization from other factors that contribute to financial crises. For example, overlending and overborrowing problems in the banking sector, inconsistent policies, and moral hazard can explain the crisis independent from capital market liberalization. In particular, if domestic financial liberalization was implemented together with external capital account liberalization, as we observe in many developing countries, it would be hard to determine which factor has a more dominant effect on financial crises.

¹ A large volume of literature analyzes speculative attack under fixed exchange rate regime. See Flood and Marion (1998) for survey of the first and second-generation models. See Eichengreen and Mussa (1998) for a survey of the general effects of capital account liberalization. They also note the lack of studies on the relationship between liberalization and crises.

Using data from the Asian Crisis countries, this paper attempts to find any common characteristics of macroeconomic variables in these countries that emerged after the liberalization and that might have contributed to financial crisis.³ For domestic fundamentals, we examine whether foreign capital flows, real exchange rates, current accounts, and stock market indices behave as predicted by theories. We also analyze additional factors that might have negatively affected domestic fundamentals.

Next, we test the effects of liberalization on contagion by examining cross-country correlations of major macroeconomic variables of the Asian Crisis countries before and after capital market liberalization. If the correlations increase over time as these countries open their capital markets, then this can be evidence that these countries become more vulnerable to outside shocks and contagious crisis after liberalization. This implies that external liberalization is at least partially responsible for financial crises.

Finally, we construct a measure for the degree of capital market liberalization for the Asian and European Crisis (1992-93) countries to examine whether these countries share a similar degree of liberalization at the time of the crisis. It is expected that if capital market liberalization is responsible for the crises, then crisis countries share a similar degree of liberalization.

The results of data analysis indicate that the Asian Crisis countries have experienced the conventionally accepted sequence of macroeconomic adjustments following external liberalization: capital inflows, real appreciation, and a worsening current account balance. However, other outside factors irrespective of liberalization, such as world price shocks, also negatively contributed to domestic fundamentals. Although cross-country correlations of output, consumption and investment increase over time in some cases, there is no systematic pattern. Cross-country comparison of measures for capital market liberalization implies that there is no certain degree of liberalization at which financial crises occur. All these results provide evidence against the direct role of capital market liberalization on financial crises.

The remaining sections are organized as follows. Section 2 explains the benefits and costs of capital market liberalization in general. Section 3 documents how capital market liberalization can affect domestic fundamentals and analyzes this argument using the data of the Asian Crisis countries. Section 4 examines various channels of contagion and presents cross-country correlations of the Asian Crisis countries to study the effects of liberalization on contagion. In

² For fundamentalist's view, see Corsetti, Pesenti and Roubini (1999). See Radelet and Sachs (1998) for the financial panic view. For the survey of channels of contagion, see Kim, Kose and Plummer (1999).

³ For related studies, see Eichengreen, Rose, and Wyplosz (1996a), and Alesina, Grilli, and Milesi-Ferretti (1994).

Section 5, we compare the Asian Crisis with the European Crisis in 1992-93 by constructing measures for capital mobility. Section 6 concludes the paper and suggests policy implications.

2. Benefits and costs of capital market liberalization

Benefits of capital market liberalization

Benefits of capital market liberalization are based on growth, intertemporal optimization, risk-sharing through portfolio diversification and efficiency gains. Developing countries that are traditionally lack of capital can gain from foreign capital inflows. Investment is no longer restricted by the amount of domestic savings. Theoretically, capital should flow into developing countries to equalize the marginal productivity of capital across countries and to efficiently allocate capital, increasing the world welfare.

In terms of intertemporal optimization, free capital flows enable a country that experiences a temporary recession to borrow from the rest of the world to smooth its consumption stream. Ability to borrow and lend across countries increases the world welfare. However, there can be a sustainable debt or credibility problem if borrowing continues for a long time.

Countries can gain from international portfolio diversification following outward and inward liberalization of capital markets. Investment in foreign equity markets allows domestic agents to share country-specific risks that cannot be diversified by domestic equity markets. However, these gains are limited to developed countries that have access to cross-country equity markets. On the other hand, most asset transactions in developing countries are banking transactions and FDI.⁴

Efficiency gains are achieved through various sources including spillovers or international transfers of technology and efficient allocation of resources through financial deepening (development of financial intermediation, direct and indirect financing, and more activities in banking sector and stock markets).⁵ Exposure to higher standards in accounting, auditing, regulations on disclosure and operating procedures can improve efficiency of domestic firms.

Costs of capital market liberalization

General costs of capital market liberalization include overheating of the economy due to excessive expansion of aggregate demand, and increasing volatility in prices and exchange rates

⁴ Note that empirical data shows that there exists home bias in portfolio holdings, which is against the theoretical predictions.

⁵ However, it is questionable whether financial deepening is based on external financial market liberalization or internal (domestic) financial market reforms.

due to volatile movement of capital flows and transmission of foreign shocks. The most serious problem arises if there is a reversal of capital flows in a large scale (capital flight). Causes of capital flight will be explained later in this paper.

Capital market liberalization can cause excessive investment in risky projects due to moral hazard problem if there is asymmetric information in the domestic economy.⁶ Under symmetric information and efficient markets, benefits of open capital accounts can be easily achieved. However, under asymmetric information where some agents have a larger information set than others, markets become inefficient and negative effects of liberalization such as adverse selection, moral hazard and herding behavior can emerge.⁷ Similarly, under domestic distortions, capital market liberalization can worsen the situation. If domestic resources are concentrated in less efficient sectors due to distortions such as tax, subsidy and tariffs, then capital inflows can intensify this concentration and worsen domestic welfare.

3. Effects of capital market liberalization on domestic fundamentals

As developing countries open their capital markets, foreign capital initially flows in to exploit the differences in returns and risk sharing gains.⁸ Directions and amounts of capital flows depend on economic situations not only in domestic countries but also in foreign countries that supply capital (for example, business cycles, interest rates, etc).⁹ For example, in the early 1990s, low interest rates in the U.S. and other developed countries combined with the reduction of restrictions on capital markets in the Asian countries facilitates capital inflows into this region. Figure 1 shows net capital flows of the Asian Crisis countries in the 1990s. We can observe that net capital inflows have continuously increased until the Crisis. A majority of capital inflows into Asian developing countries has been concentrated on FDI and bank lending and borrowing.

The basic scenario of how capital market liberalization can negatively affect domestic economy can be summarized as follows¹⁰: As capital flows into emerging markets, domestic currency appreciates in real terms because foreign investors exchange foreign currencies into

⁶ For example, implicit guarantee of loan by government gives incentives to banks to invest in risky assets.

⁷ See Eichengreen and Mussa (1998) for detailed explanations.

⁸ This is partly because the initial stage of liberalization targets on capital inflows, while maintaining restrictions on capital outflows.

⁹ See, for example, Y. Kim (1999). He emphasizes that the supply-side conditions in developed countries have stronger effects on capital flows than demand-side conditions in developing countries.

¹⁰ Many studies have documented the effects of capital account liberalization in emerging economies. See, for example, Corbo and Hernandez (1994), Calvo, Leiderman and Reinhart (1994), Fernandez-Arias and Montiel (1995), Khan and Reinhart (1995), Spiegel (1995) and Koenig (1996), Antzoulatos (1996), Montiel (1996), and Kamin and Wood (1998). For theoretical models, see Obstfeld (1987) and Edwards (1989).

domestic currencies.¹¹ This weakens the competitiveness of domestic firms, worsening the current account imbalances. Moreover, capital market liberalization causes boom in domestic economy and worsens overlending and overborrowing problems because domestic banks and firms can borrow at a low foreign interest rate and therefore underestimate the cost of capital, especially under the fixed exchange rate regime.¹² The prolonged CA deficits can be sustained by capital account surpluses through foreign capital inflows (in other words, borrowing from abroad). However, if foreign investors lose their confidence in domestic economy, capital flows are reversed and these countries face liquidity constraints due to the lack of enough foreign reserves. Exchange rates suddenly depreciate due to speculative attacks, which multiplies the burden of foreign debts and worsens problems in the banking sector.

Data from the Asian Crisis countries confirm this conventionally accepted sequence of macroeconomic adjustments following external liberalization. Figure 2 shows real exchange rates of the five Asian Crisis countries. The figure indicates that real exchange rates continuously appreciate in the 1990s, even though nominal exchange rates remain almost unchanged.¹³ The real appreciation negatively affects current account balances as can be seen in figure 3. In most countries, the current accounts remain in deficit for the whole period (as much as 8% of GDP). Export growth rates are also negatively affected, which is shown in figure 4. Export growth rates have increased until the middle of 1995, while it significantly decreased in the late 1995 and 1996.

Figure 5 shows stock market indices of the Asian Crisis countries. Most indices increased in mid 1990s and sharply declined from the first quarter of 1997, except Korea and Thailand where declines started from 1995. Effects of foreign capital on stock markets are not as significant as the effects on other financial sectors because the amount of portfolio investment in stock markets was not that large. Decline in the stock market indices before the Crisis reflects widespread bankruptcies and other problems in the corporate sector.

However, capital market liberalization is not the only factor affecting macroeconomic performance of the Asian countries. Other factors also influenced domestic fundamentals irrespective of the degree of liberalization. In particular, current account and export growth rates are highly subject to outside shocks. Figure 6 shows the world oil price in the 1990s. We can

¹¹ Under the flexible exchange rate regime, nominal exchange rate appreciates as demand for domestic currency increases. Under the fixed exchange rate regime, increased money supply and aggregate demand (unless capital inflows are fully sterilized) increases prices of nontraded goods, which eventually appreciates domestic currency in real terms.

¹² See, for example, McKinnon and Pill (1996).

¹³ Increases in labor wages also contributed to increases in price level of these countries, which eventually contributed to real appreciation of their currencies.

observe a sharp increase in oil price in 1995 and 96, which caused inflation and worsened export growth rates and current account (except Malaysia) in this region.¹⁴ Figure 7 shows average memory chip prices that continuously decline in the 1990s. This explains the deterioration of current account, especially in Korea where memory chip is a major export good.

Another factor that affected export growth rates is the depreciation of Yen in 1996. A depreciation of Yen worsens competitiveness of the other Asian countries and their trade balances. Figure 4 indicates that the Yen depreciation coincides with the decline in export growth rates in these countries.¹⁵ All these results suggest that capital market liberalization is not the only factor that negatively affected domestic fundamentals in this region.

4. Channels of contagion

This section summarizes various channels of contagion and analyzes whether capital market liberalization increased the possibility of contagion, by examining cross-country correlations of macroeconomic variables. We adopt a broad definition of contagion: contagion is the transmission of shocks from one country to another through various channels, even those we observe in normal times.¹⁶ We categorize factors explaining contagion into three groups: (1) trade channel, (2) financial channel, and (3) pure contagion.¹⁷

The three transmission channels work as follows: First, transmission of shocks through trade channel occurs when devaluation of a currency in response to country-specific shocks affects economic fundamentals of other countries through the terms of trade and income effects. In particular, if a group of countries compete for the same export markets, when one devalues its

¹⁴ The share of fuel in total imports is large in most countries, especially in Korea and the Philippines (more than 15%). In Malaysia, the import of fuel consists of only 5% of total imports, which can explain the fact that the current account of Malaysia improved between 1995 and 1996.

¹⁵ Some argue that the depreciation of Chinese renminbi in 1994 worsened the economic environment of this region. However, figure 4 shows that the export growth rates of these countries rise in this period.

¹⁶ For the use of the broad definition, see Eichengreen and Rose (1996), and Glick and Rose (1998). Some narrowly define contagion as specific transmission channels that we observe only during financial crises and that cannot be explained by standard propagation channels. See Rigobon (1998), Masson (1998), and Van Rijckeghem and Weder (1999).

¹⁷ Others use different definitions for classifying channels of contagion: Forbes and Rigobon (1999) use crisis-contagion and non crisis-contagion theories to distinguish the normal channel of transmission and particular channel of transmission that works only during crisis. Kodres and Pritsker (1999) define rational channels that include real, financial market, and financial institution channels. Abeyasinghe (1999) uses the real interest rate channel in explaining the contagion from the Thailand recession to the rest of Asia. Some researchers, including Masson (1998), consider external common shocks as channels of contagion, but we consider them together with domestic fundamentals since these shocks work indirectly through changing domestic fundamentals.

currency and builds a competitive edge in export markets, the other countries might soon have to devalue. Many researchers have analyzed spillovers through trade channel even before the Asian Crisis.¹⁸

Second, the financial channel looks into the role of international investors and their contribution to the spread of the Asian Crisis. When an emerging country is hit by an economic crisis, all international market participants reevaluate their positions in other emerging countries and may withdraw their funds from those countries. Facing losses in one country, international banks have incentives to sell assets in other countries to restore their capital adequacy ratios, to meet the regulatory requirements, or to manage their risk exposure. Losses in one emerging market can lead mutual funds to reposition their portfolio and sell off their assets in other emerging markets that have not been attacked, due to margin calls from investors. This channel is related to liquidity constraints in the financial sector.

The role of asymmetric information among investors in explaining contagion can be found in Calvo (1999). Suppose informed investors, due to some type of liquidity constraint, sell their assets in a country with no change in its macroeconomic fundamentals. Uninformed investors may sell off this country's assets because they cannot distinguish between a liquidity shock and a bad signal. This can explain a sell-off of assets of a country whose fundamentals are sound.

Finally, unlike the mechanical spillovers discussed above, pure contagion is related to shifts in market sentiments and perception towards risk. In other words, contagion takes place because the initial country-specific shock is artificially replicated in other countries by a sudden reversal in market's perception about the state of those economies.¹⁹ One theory in this category assumes that international investors follow "herd behavior" in portfolio and risk allocations. Investors pay close attention to other investors' behavior in the market, partly because they worry about their relative performance in the market compared to others. Therefore, as a market leader with a relatively large information set moves, others are likely to follow.

Contagion through trade channel is not directly related to capital market liberalization, except for the fact that trade liberalization is usually implemented together with financial market liberalization. High volume of trade within the region or with common trading partners can increase the possibility of contagion through trade channel. Capital market liberalization can facilitate contagion through financial channel by increasing speed and magnitude of capital flows across countries. Once crisis started, free capital flows can worsen the situation by allowing capital to flow out quickly.

¹⁸ See, for example, Gerlach and Smets (1995) and Eichengreen, Rose and Wyplosz (1996b).

¹⁹ See, for example, Radelet and Sachs (1998), and Masson (1998).

On the other hand, capital market liberalization can improve efficiency of the market and reduce problems based on asymmetric information such as moral hazard or herd behavior. For example, efficient capital markets can provide clear and transparent information about the conditions of firms and countries, which reduce the possibility of irrational behavior of international investors. In this case, open capital markets can help prevent financial crises.

In this section, we investigate the role of capital market liberalization on contagion by observing how closely the macroeconomic variables of these countries move over time. We still maintain the broad definition of contagion. If business cycles of these countries become synchronized as they open their capital markets, then we can say that capital market liberalization increases the possibility of contagion.

Tables 1 to 3 exhibit cross-country correlations of output, consumption and investment from 1960 to 1996. All the data are real, logged and detrended with the HP filter so that we can capture cyclical movements, not trends. We divide the sample period into two sub-periods, 1960-1984 and 1985-1996, to examine any changes in correlations over time as markets become liberalized.²⁰

Table 1 shows cross-country correlations of output. In all cases, with the exception of Korea with Malaysia and the Philippines, cross-country correlations are positive and in several cases they are significant for the entire sample period. However, the correlations increase over time in only 4 out of 10 cases. There is no evidence that output fluctuations of these countries become more synchronized over time. Results for consumption and investment, in tables 2 and 3, indicate that the correlations increase in the second period in 7 and 8 cases out of 10, respectively. There is more synchronization of business cycles, at least in consumption and investment, as capital markets liberalized. These results imply that capital market liberalization contributed to financial crises indirectly by increasing the possibility of transmission of shocks across countries or contagion.

The relative importance of the two causes of financial crises (domestic fundamentals and contagion) is still under debate. Therefore the role of capital market liberalization on financial crises depend on the relative importance of these two factors.

5. Comparison with the European Crisis in 1992

In this section, we compare the Asian Crisis with the ERM Crisis in 1992-93 to examine any common features in capital markets, particularly the degree of capital market liberalization. If

capital market liberalization was a direct cause of the crisis, then we should observe a similar degree of liberalization, or at least certain systematic movements, at the time of crisis in the crisis countries.

For this project, we need a measure for the degree of capital market liberalization. However, the appropriate measure is hard to find. Most empirical studies rely on dummy variable regression using bivariate index of restrictions on payments for capital transactions in dealing with capital mobility. Several methods have been used to measure degree of international capital mobility (or capital market liberalization):

- (1) Onshore-offshore interest rate differentials: As international capital mobility increases, interest rates on the same currency-denominated assets should be the same irrespective of the location of that asset. Therefore, the difference between onshore and offshore interest rate should be near zero.
- (2) Interest parity condition: Interest parity condition is an arbitrage condition for covered or uncovered returns of two assets that are denominated in different currencies but in the same risk group. This condition, particularly the covered interest parity condition, should hold under perfect and efficient capital markets.
- (3) Saving-investment correlation: Domestic saving and investment should have no relationship under perfect capital mobility since a country's saving responds to worldwide investment opportunities while a country's investment is financed by a worldwide pool of capital.
- (4) International consumption correlation: Under complete financial market with perfect risk sharing, changes in consumption growth rates of different countries should be similar.

We use the interest parity condition to measure degree of capital market liberalization. In particular, we use the covered interest parity condition and calculate the differences between domestic returns and covered foreign returns (or covered interest differentials; CID) of the same class of asset:

$$CID_t = (1+i_t) - (1+i_t^*) F_t / E_t$$

where i_t and i_t^* are interest rates for domestic and foreign countries, F_t is the forward exchange rate, and E_t is the spot exchange rate.

A non-zero value for CID implies that there is an arbitrage opportunity, which reflects the existence of capital controls, transaction costs, and default risks of a country. We should observe

²⁰ Most Asian Crisis countries implemented some kind of liberalization policies from mid 1980s.

lower absolute values of CIDs in more liberalized and efficient markets.²¹ By comparing CIDs of various crisis countries, we can indirectly test the relationship between capital market liberalization and financial crises.

We use the end-of-month data for three-month interest rates (Treasury Bill rates whenever possible), three-month forward rates and spot exchange rates to calculate CID.²² For the base country to obtain i^* and the exchange rate, we use Germany for European countries and the U.S. for the Asian countries.²³ We take the 6-month average of absolute CIDs before the start of the crisis, which is shown in Figure 8.²⁴

The figure indicates that there is no certain level of CIDs that are common to the crisis countries. The average CIDs range from less than 0.2% in France to 1.5% in Indonesia (note that these are three-month returns). Crisis occurred to countries irrespective of their level of capital market liberalization. However, we can observe a distinctive feature that the average absolute CIDs of European Crisis countries are lower than those of the Asian Crisis countries. This observation is consistent with the fact that the capital markets of European countries in 1992 were more open than those of the Asian countries in 1997, in terms of statutory regulations.

Two important features can be found among the Asian countries. The average CIDs of Taiwan and Singapore, countries that were only slightly affected by the Asian Crisis, are lower than other Asian Crisis countries. The values of Malaysia and the Philippines are significantly lower than those of the remaining three countries, Indonesia, Thailand and Korea. Considering that financial crisis was relatively severe in Indonesia, Thailand and Korea, these two observations imply that the crisis is likely to have more severe effects in countries with less degree of capital market liberalization. Having less efficient capital market (or more restrictions) makes a country more susceptible to financial crises.

5. Conclusion

In this paper, we attempt to answer the following questions: does capital market liberalization cause financial crises? We examine two channels through which capital market liberalization can cause crises: domestic fundamentals and contagion. Data analysis of the Asian

²¹ We use absolute values because both positive and negative values reflect restrictions (inward and outward) in the capital market.

²² Interest rate data are from the *Datastream* and forward rate data are from the *Bloomberg*.

²³ During the estimation period, most non-European countries tightly control or nearly fix the exchange rate against the U.S. dollars, while the European countries tightly control or nearly fix the exchange rate against the German Marks.

²⁴ The start dates of the crises are constructed based on Glick and Rose (1998).

countries reveals that although there is some evidence that capital market liberalization weakened domestic fundamentals or increased the possibility of contagion, many other factors such as world price shocks also contributed to financial crises. Moreover, cross-country comparison of the Asian Crisis with the European Crisis shows that financial crises occur irrespective of the degree of capital mobility. Moreover, financial crises appear to be more associated with countries with less efficient capital markets. All these results imply that there is no direct relationship between capital market liberalization and financial crises.

Capital market liberalization can do more harm than good if domestic markets are inefficient due to the problems related to asymmetric information such as moral hazard and herd behavior. Capital market liberalization can also worsen the situation by increasing the speed and magnitude of capital flight once crisis started. On the other hand, capital market liberalization can bring significant benefits in the long term as it improves efficiency of the market by reducing domestic distortions and information asymmetry. Having sound and efficient domestic financial markets before liberalizing capital account may be the best policy option but it is not plausible in most cases. It would be extremely hard to accomplish domestic financial reform without competitions from the world and external pressure from foreign investors. Open capital account can also shorten the process of domestic financial reform. Therefore, coordinating the speed and sequence of capital market liberalization is very important in maximizing the benefits of open capital account.

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Table 1. Cross-country Correlations of Output

1960-1996	Indonesia	Korea	Malaysia	Philippines
Korea	0.11			
Malaysia	0.53*	-0.18		
Philippines	0.37*	-0.06	0.46*	
Thailand	0.11	0.35*	0.19	0.53*

1960-1984	Indonesia	Korea	Malaysia	Philippines
Korea	0.28			
Malaysia	0.42	0.05		
Philippines	0.28	-0.07	0.14	
Thailand	-0.03	0.40	-0.15	0.27

1985-1996	Indonesia	Korea	Malaysia	Philippines
Korea	-0.60			
Malaysia	0.73 (+)	-0.64		
Philippines	-0.09	0.60 (+)	-0.18	
Thailand	-0.29	0.30	0.27 (+)	0.32 (+)

Data source: IFS.

Notes: All data are real at 1990 prices and logged and detrended using the Hodrick-Prescott (HP) filter with the smoothing parameter set at 100. The cross-country correlation is measured by the correlation coefficient of the series of two countries. The reported statistic for the 60-96 period is significant at 5% level if it lies outside of $[-0.32, 0.32]$, and it is indicated by *. The (+) sign indicates an increase of the statistic in the 85-96 period from the 60-84 period.

Table 2. Cross-country Correlations of Consumption

1960 - 1996	Indonesia	Korea	Malaysia	Philippines
Korea	-0.34*			
Malaysia	-0.08	0.32*		
Philippines	0.01	0.12	0.27	
Thailand	-0.17	0.32*	0.36*	0.36*

1960 - 1984	Indonesia	Korea	Malaysia	Philippines
Korea	-0.34			
Malaysia	-0.15	0.07		
Philippines	-0.04	-0.19	-0.24	
Thailand	-0.31	0.03	-0.08	-0.09

1985 - 1996	Indonesia	Korea	Malaysia	Philippines
Korea	-0.37			
Malaysia	-0.19	0.85 (+)		
Philippines	-0.37	0.82 (+)	0.77 (+)	
Thailand	-0.11 (+)	0.80 (+)	0.83 (+)	0.60 (+)

Data source: IFS.

Notes: All data are real at 1990 prices and logged and detrended using the Hodrick-Prescott (HP) filter with the smoothing parameter set at 100. The cross-country correlation is measured by the correlation coefficient of the series of two countries. The reported statistic for the 60-96 period is significant at 5% level if it lies outside of $[-0.32, 0.32]$, and it is indicated by *. The (+) sign indicates an increase of the statistic in the 85-96 period from the 60-84 period.

Table 3. Cross-country Correlations of Investment

1960-1996	Indonesia	Korea	Malaysia	Philippines
Korea	-0.25			
Malaysia	0.10	-0.35*		
Philippines	-0.02	0.11	0.45*	
Thailand	-0.05	0.51*	0.17	0.51*

1960-1984	Indonesia	Korea	Malaysia	Philippines
Korea	-0.33			
Malaysia	0.12	-0.64		
Philippines	-0.12	-0.01	0.03	
Thailand	-0.28	0.43	-0.43	0.08

1985-1996	Indonesia	Korea	Malaysia	Philippines
Korea	0.76 (+)			
Malaysia	-0.05	0.22 (+)		
Philippines	0.38 (+)	0.42 (+)	0.17	
Thailand	0.68 (+)	0.89 (+)	0.44 (+)	0.65 (+)

Data source: IFS.

Notes: All data are real at 1990 prices and logged and detrended using the Hodrick-Prescott (HP) filter with the smoothing parameter set at 100. The cross-country correlation is measured by the correlation coefficient of the series of two countries. The reported statistic for the 60-96 period is significant at 5% level if it lies outside of $[-0.32, 0.32]$, and it is indicated by *. The (+) sign indicates an increase of the statistic in the 85-96 period from the 60-84 period.

Fig. 1 Net Private Capital Flows

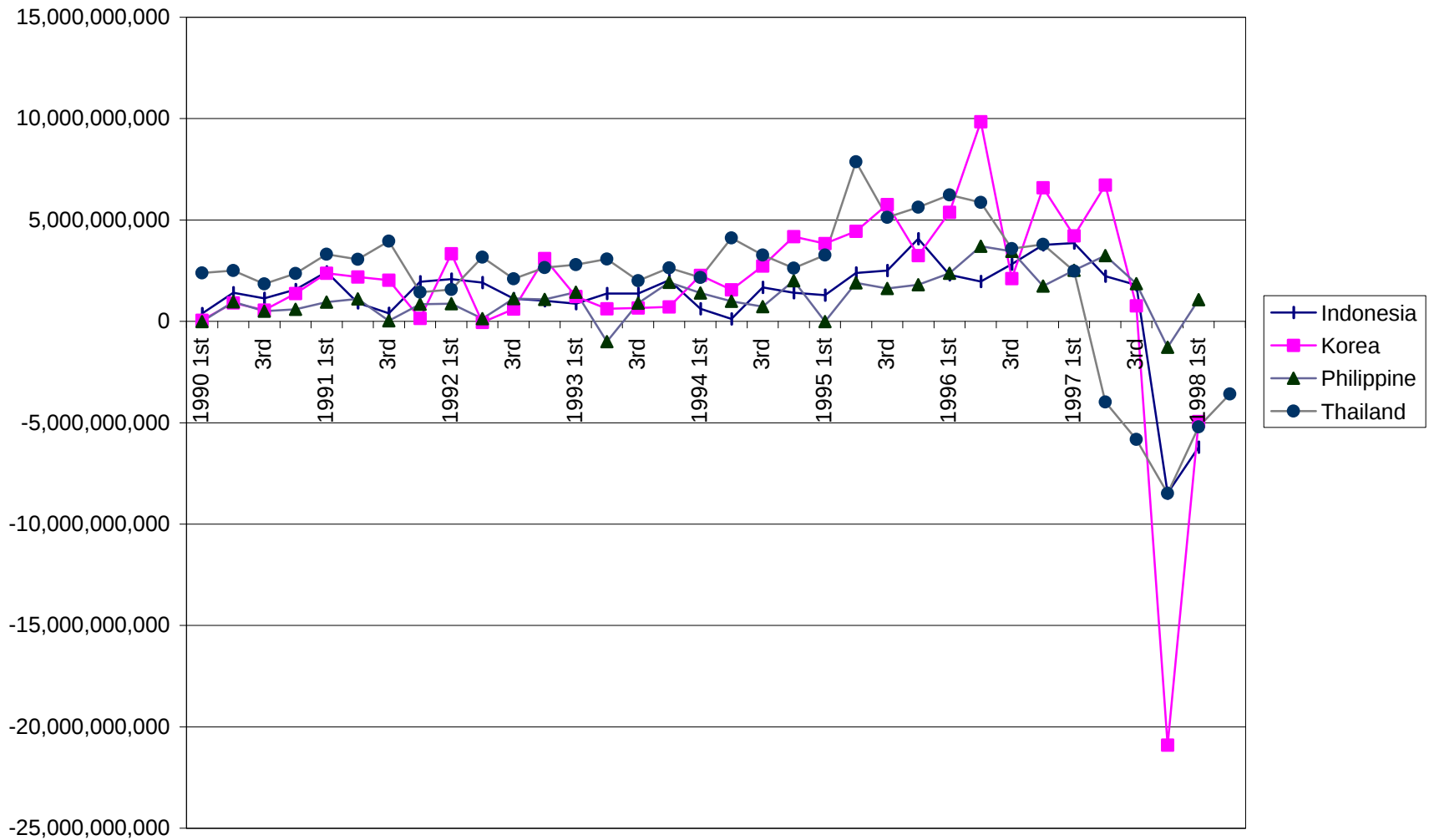


Fig 2. Real Exchange Rates (logs, 1990=100)

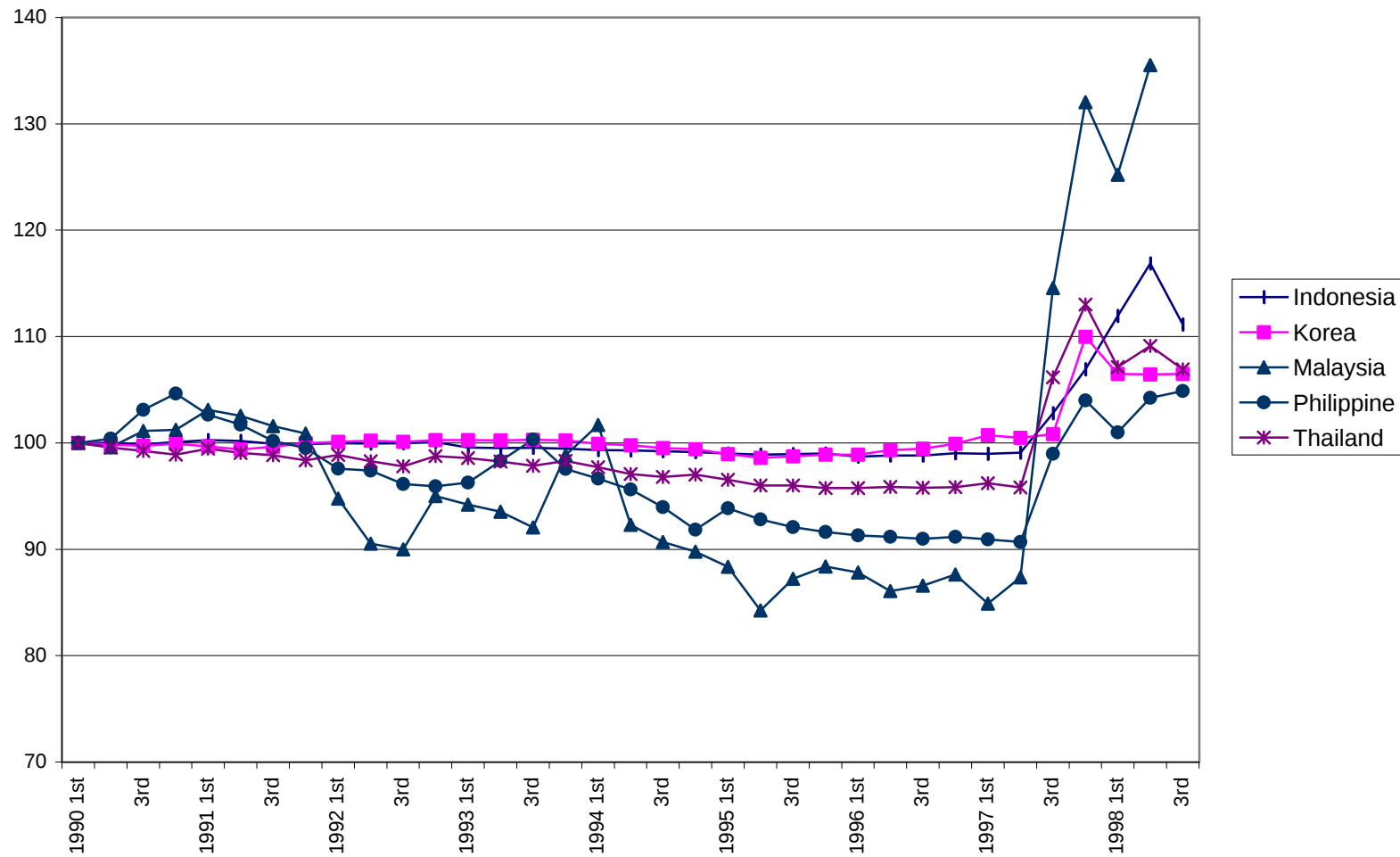


Fig 3. Current Account / GDP

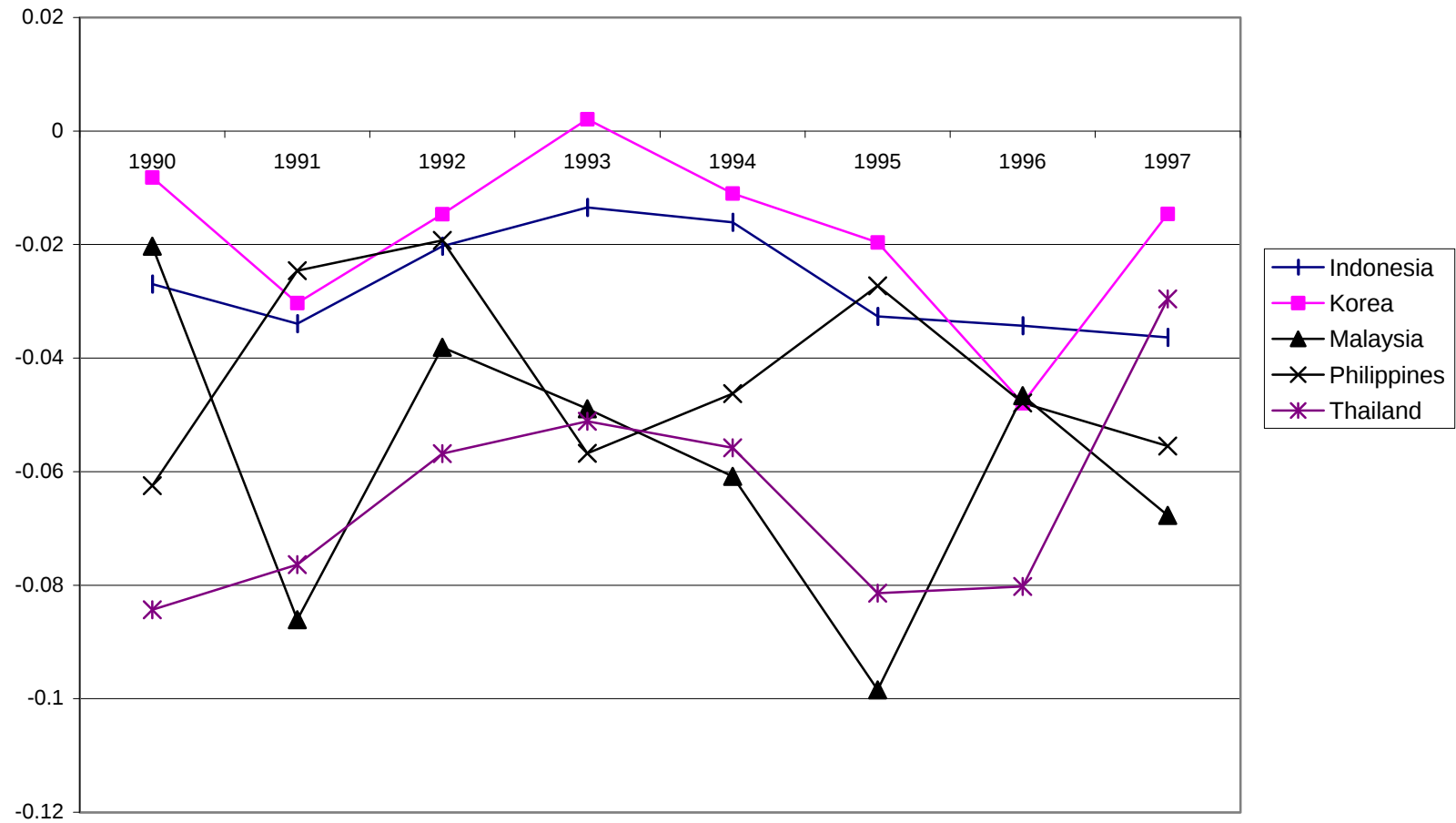


Fig 4. Stock Index (1st Quarter of 1990 =100)

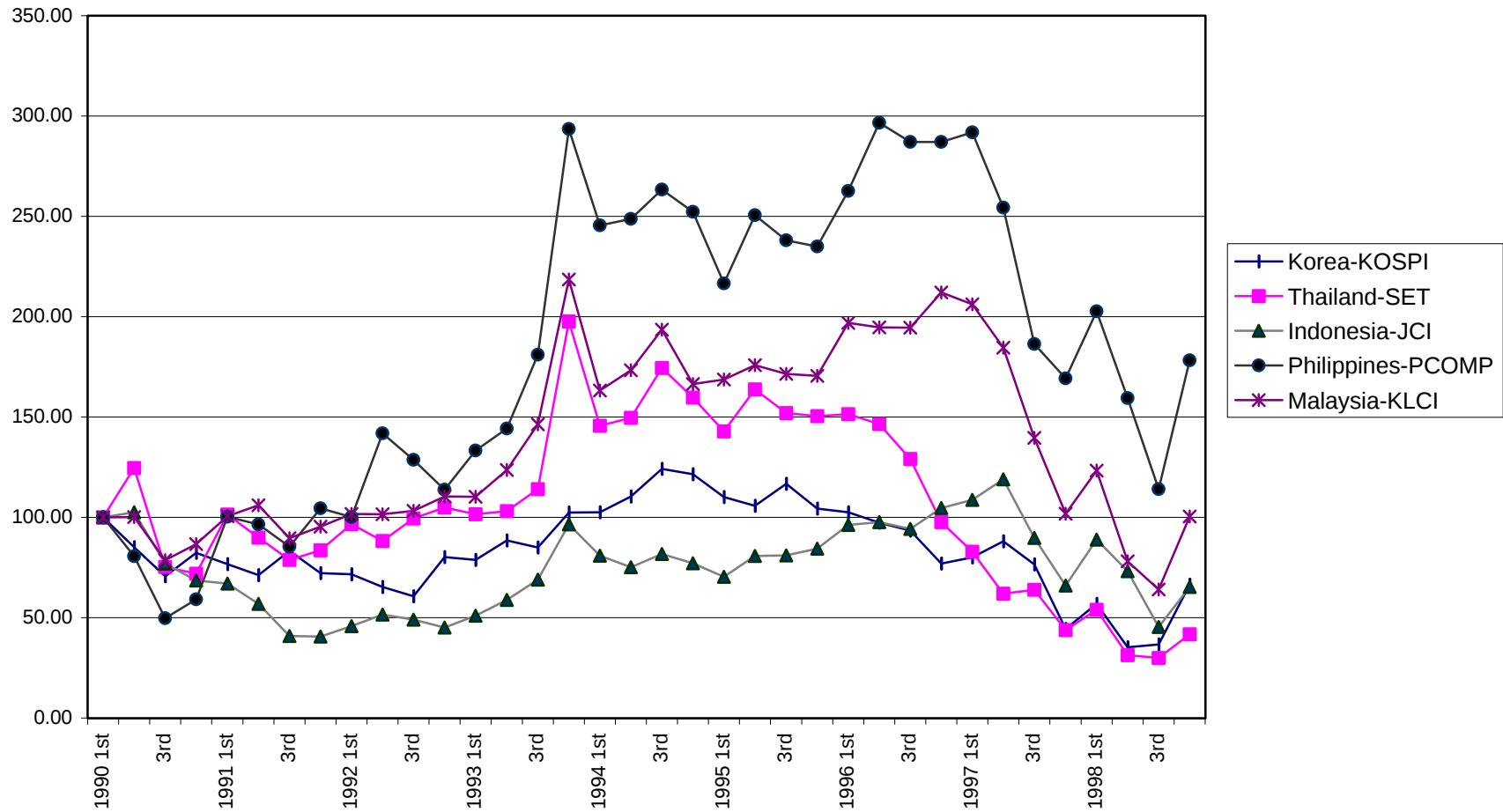


Fig. 5 U.S. Interest Rates (TB rate)

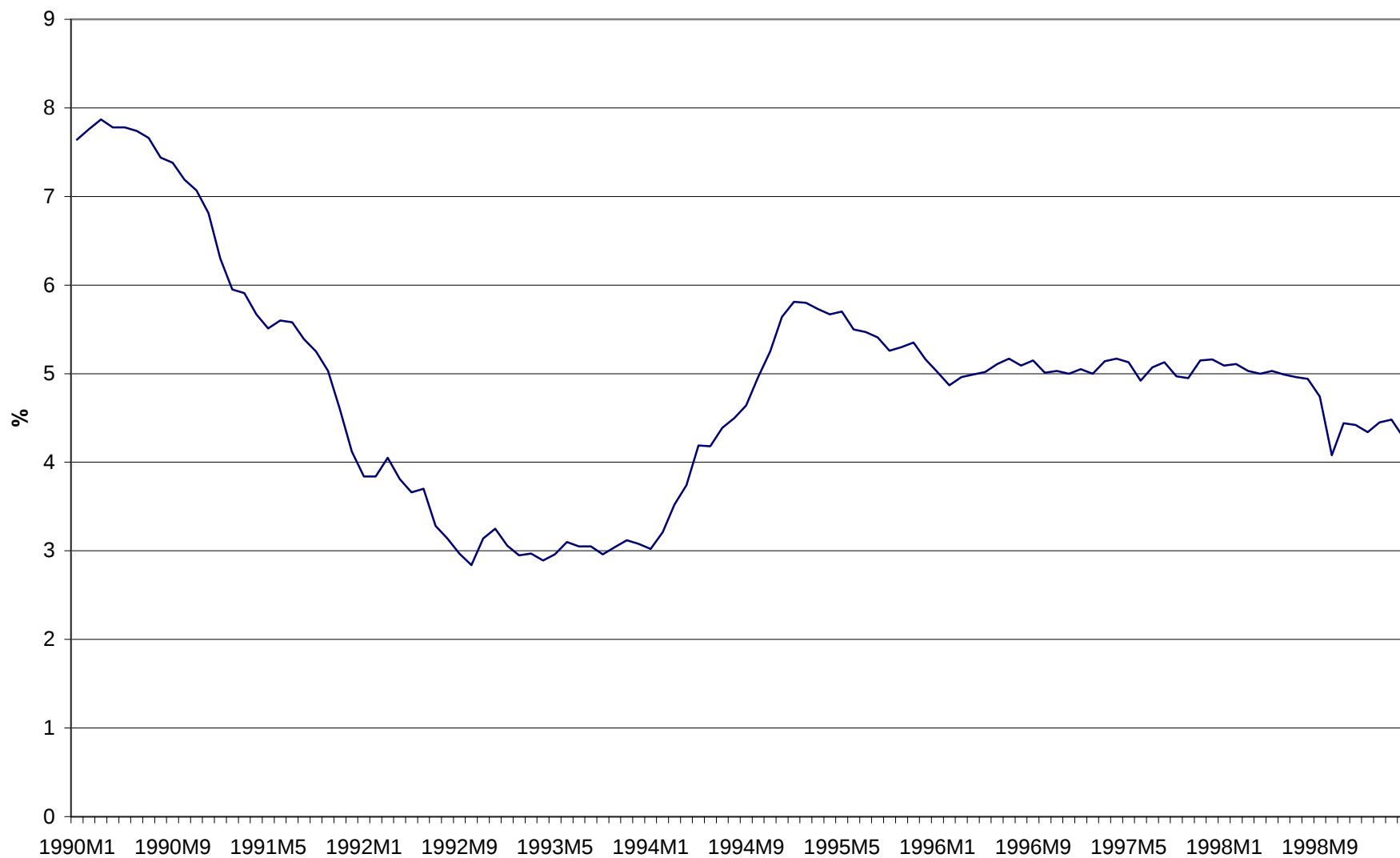


Fig. 6 Oil Price (Crude Oil U.S. Spot Prices - WTI CUSHIN)

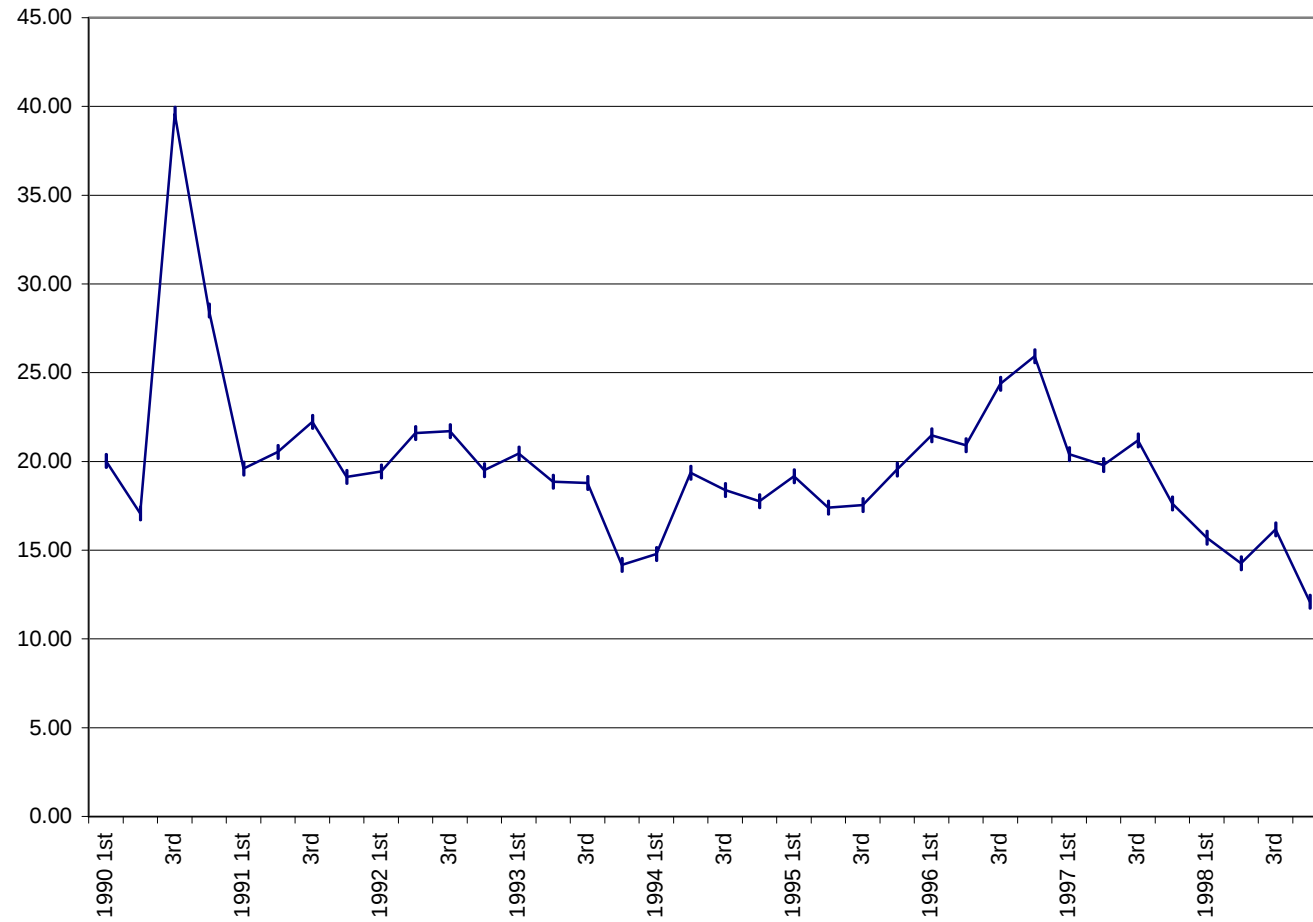


Fig 7. Memory Chip (DRAM) Price

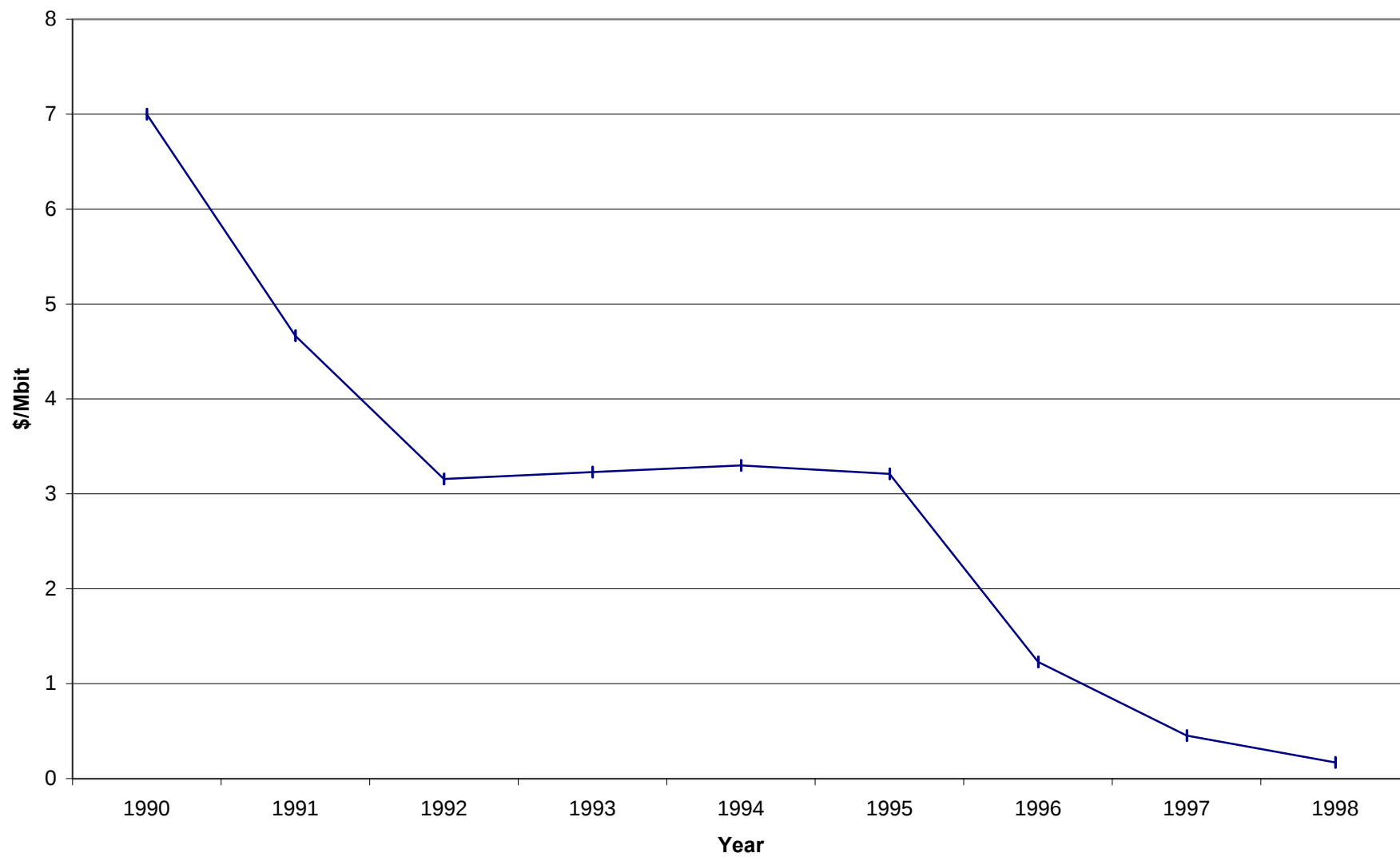


Figure 8. Absolute CIDs of Selected Countries (6-month average before the crisis)

