

Macroeconomic Management and Financial Stability: The Implications for East Asia

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Abstract: This paper examines the determinants of economic and financial linkages between developed and developing countries, with special focus on East Asia. The synchronization of business cycles depends upon trade flows, production structures, and to a lesser extent, capital account openness. The correlation of stock and bond returns in emerging markets also depends upon trade flows. There does not appear to be a statistically significant difference between the behavior of East Asian economies and developing countries in other parts of the world. Finally, the analysis confirms that dollar movements have a large effect upon East Asian competitiveness, especially in the years leading up to the crises of 1997-98. However, the effect of dollar/euro movements appears to be larger than that of dollar/yen movements, contrary to expectations. In the post-crisis period, only the Chinese yuan conforms to the general presumption that dollar/yen fluctuations have a dominant impact on East Asian effective exchange rates. The paper discusses some recent efforts to reform the international financial architecture. The conclusion discusses the prospects for adjustment in light of the empirical relationships identified.

Keywords: macroeconomic linkages, trade flows, financial integration, international financial architecture, international adjustment

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1. Introduction

It is a given that the ties that link the developed and developing economies seem to be ever strengthening – or binding – depending upon one’s perspective. Economic events that in a previous decade would hardly elicit a nod from the policy community now provoke vigorous responses from average citizens and small and medium firms.

This statement applies with even greater force when considering the interactions between the developed countries and the newly industrializing and developing economies of East Asia. Vast capital flows to the region set the stage for the boom and bust cycle of the 1990s. The rapid recovery from the resulting East Asian financial crises was partly attributable to the very high share of electronics trade with the US at exactly the same time that the New Economy boom was underway. And more recently, the insatiable American demand for capital has been aided and abetted by the economic policies set in the capitals of Asia Pacific.

Against this backdrop of heightened interdependence it is useful to step back and quantify the nature and extent of these economic linkages, especially as the course of the macroeconomic adjustment process will depend upon these factors. This paper examines data for the last quarter century, with an eye to identifying the factors that determine the degree to which business cycles, asset returns and exchange rates covary between developed and developing economies, with special reference to East Asia.¹

Section 2 surveys some broad stylized facts about the macroeconomic linkages between developed and developing countries. The synchronization of business cycles is then related to trade links, production structure similarities, openness to capital flows, and macroeconomic policy coherence.

¹ See Prasad et al. (2003) for an examination of the broader issues of globalization and macroeconomic volatility. Cheung, Chinn and Fujii (2003, forthcoming) examine the links between the US, Japan and the economies of China, Hong Kong, SAR and Chinese Taipei from the perspective of parity conditions.

The concept of macro economic policy coherence is subject to a multitude of differing interpretations. For our purposes, we might start with a particularly typology that identifies coherence along the dimensions of (1) within (between monetary vs. fiscal policies), (2) between macro and other policies, (3) between OECD or G-7 countries, and (4) between OECD and non-OECD countries.² The focus of this paper is to use as the object of interest the correlation between business cycles – business cycle coherence – and identify the determinants.

The relationship between asset price returns in major advanced economies and other economies is the focus of analysis in Section 3. Asset return correlations are related to trade links, bank lending and direct investment flows, as well as openness to capital flows. In both Sections 2 and 3, trade flows are found to be the central determinants of the synchronization of economic and financial activity. In certain instances, the openness of economies to capital flows is also important.

The implications for East Asian developing and newly-industrializing economies of G-3 currency movements are discussed in Section 4. While there is some evidence that movements in the dollar/yen rate have been important determinants of shifts in East Asian competitiveness, it is not conclusive. Indeed, changes in the dollar/euro rate appear to have been more important, especially when one takes into account the relative substitutability of trade flows emanating from, and going to, the various East Asian countries.

Section 5 recounts some of the major initiatives in reforming the international financial architecture, with a focus on aspects of special concern to the East Asian economies. Section 6 provides some conjectures regarding the mode of macroeconomic adjustment in light of the empirical relationships outlined.

² I owe this enumeration to a speech by Otto Genée, of the Netherlands Ministry of Foreign Affairs.

2. Macroeconomic Linkages

2.1 Previous Literature and Stylized Facts

In light of the economic weight of the developed economies in the world economy, it would be surprising if the macroeconomic conditions in the developed economies had little import for the performance of developing economies. First the business cycles in the developed economies, both in terms of quantities and prices, have large effects on developing country exports. The link to aggregate demand in those countries is obvious. Second, in addition to private demands, monetary, as well as fiscal, policies affect asset prices in the industrial countries, and these price changes propagate to the non-industrial countries. These interest rate changes also have an impact upon the quantities and composition of capital flowing to the developing countries.

Some of these channels have been examined numerous times over the years. Dornbusch (1985) is an early example. As capital markets have grown in importance, the emphasis has changed to stress alternative linkages, but still most of the points will be familiar to the typical macroeconomist interested in developing economies. More recently Frankel and Roubini (2003) and Reinhart and Reinhart (2003) have reviewed some major linkages.³ Instead of replicating their analyses, I will highlight some key stylized facts that provide a backdrop to the analyses of the determinants of these linkages.

In order to set the stage in a systematic fashion, I employ a useful typology developed by Reinhart and Reinhart (2003); it differentiates (somewhat artificially) between business cycle and monetary policy shocks. This typology is depicted in Table 1, adapted from their table.

³ This is a very large literature, so that it is difficult to enumerate all the relevant studies. In addition to the citations

Business cycle effects link developed to developing countries by way of trade, both their volumes and term of trade.

The simplest summary statistic regarding this growth linkage is provided by Frankel and Roubini (2003). They report that over the 1977 to 1999 period, a one percentage point increase in the growth rate of GDP in the G-7 countries leads to a 0.78 ppt increase in emerging markets. This is hardly a structural parameter; rather, as a stylized fact it should be considered a departure point for a more detailed analysis.

One such study was conducted by Kose et al. (2003). They calculated a G-7 aggregate GDP and consumption measure (evaluated in PPP terms) over the 1960-99 period. They then examined how correlations between the G-7 aggregate and developing country aggregates evolved over time. Interestingly, they found that the correlation of output was not monotonically increasing over time; rather it rose during the period they define as one of “common shocks” (1973-86), and fell in the “globalization” period (1987-1999).

Some of the key aspects of the linkages between developed and developing economies can be illustrated with some simple scatter plots of series. I rely upon data for several IMF aggregates over the past quarter of the century, including the set of major advanced countries (i.e., the G-7), all developing countries, developing Asia and the newly industrializing Asian economies. In Figure 1, developing country and developing Asia GDP growth rates are plotted against G-7 growth rates, along with a simple bivariate regression line relating developing country growth to G-7 growth. There is a clear positive slope. For purposes of comparison, the regression line for developing Asia is also included in this graph. Interestingly, there does not

in the text, see also Agenor, McDermott and Prasad (2000).

seem to be a substantial difference in the strength of the relationship, although Asian countries seem to be growing more rapidly than the overall developing country group.⁴

As indicated by the regression lines in Figure 2, growth rates in the newly industrializing Asian economies,⁵ on the other hand, do appear to be more sensitive to growth rates experienced by the G-7 countries than do the developing Asian countries. Hence, not unexpectedly, the responsiveness of developing countries to conditions in the advanced economies varies across groupings, even within Asia.

Other factors are important to growth. This is not the place to examine them all exhaustively. However, two other factors merit some discussion. The first is the real rate of interest in the advanced economies, for example the US real interest rate. One can think of this variable as a crude proxy measure for monetary policy and the state of the business cycle. Frankel and Roubini (2003) find that a one percentage point (ppt) increase in real G-7 rates leads to a 0.77 ppt reduction in income growth in the Western Hemisphere, but also find that the effect is much more difficult to identify in the full set of market borrowers.

It is difficult to determine exactly the mechanisms whereby which higher US rates affect these countries. In a more select group of seven emerging markets, Uribe and Yue (2003) determine that about 20 percent of the variation in economic activity is explained by US interest rate shocks. Interestingly, they find that about two-thirds of this effect is mediated through the country spread effect; that is country spreads on the US Treasury bill rate increase systematically with US interest rate shocks.

⁴ This result might appear counterintuitive, given East Asia's heavy dependence on electronics exports during the 1998-2000 period. For instance, electronics and electronic components accounted for about 25% of Thai exports in 2000, and grew 20% in the first half of 2000. However, this period represents more recent trends, and indeed the correlation is higher for the newly industrializing countries that were also highly dependent upon electronics exports (19% of Korean exports, and 94% growth rate in 2000H1) (Spencer, 2000).

⁵ This group comprises Hong Kong, SAR, Korea, Singapore, and Chinese Taipei. Note: these economies also appear in the "Advanced countries" grouping.

A simple scatter-plot of developing country growth on the ex post real rate confirms the lack of a simple bivariate pattern. After extracting that amount of the correlation associated with G-7 GDP growth,⁶ one finds that the correlation is negative (see Figure 3), reflecting the commonly held belief that developing country growth is sensitive to US credit market conditions. This effect is manifested in the international capital flows entries in the business cycle and monetary policy panels of Table 1.

A more explicit recounting of the correlations is presented in Table 2. Growth rates for developing country groupings – either all-developing, developing Asia, or newly-industrializing Asia – are regressed against the advanced country growth rates and the real interest rate (Panel A). As a check for robustness, the regressions are repeated using advanced country growth rates in the place of G-7 growth rates (Panel B).

The regression results confirm the impressions delivered by the figures. The sensitivity of growth rates to advanced country growth rates is statistically indistinguishable between all developing countries and developing Asia. On the other hand, the newly industrializing Asian countries are much more linked to the advanced countries (although statistical test would fail to reject the null of equality). US real interest rates also exert a negative effect in two instances, but not for newly industrializing Asia, which exhibits a positive coefficient, with borderline significance. However, it would probably be unwise to read too much into these simple regressions, especially since the only highly significant coefficient is negative, for all developing countries. This pattern is essentially reproduced in Panel B, where advanced country growth rates replace G-7 country growth rates.

What might the channels be through which economic activity in the core countries is propagated to developing countries? Increased economic activity might work through changes in

⁶ The residual from a regression of developing country growth on G-7 growth is used as the dependent variable.

the terms of trade, a factor especially relevant for commodity exporters.⁷ This is the “Relative Price Effect” in the business cycle panel of Table 1. Figure 4 presents a scatterplot between the change in the developing country terms of trade and the advanced country growth rate. The association is positive, and statistically significant. Borensztein and Reinhart (1994) report that the elasticity of commodity prices with respect to developed country industrial production is between 1.4 to 1.6.

Another channel is via capital flows; indeed, some observers have pointed to the “capital flow cycle” as the origin of the “unholy trinity of financial contagion” (Kaminsky, Reinhart and Vegh, 2003).⁸ Regardless of one’s view on this particular question, it is clear that surges in capital flows to and from emerging markets complicate the policymaker’s task, and influence developing country economic activity, so it is important to consider how developed country conditions affect these flows. One prominent view is that capital flows primarily respond to the push of low interest rates in the developed countries.⁹ This perspective is illustrated by Figure 5, which show net private capital flows to emerging markets (in 1995\$) as a function of the US real interest rate. There is a clear negative relationship, once again validating the “push”, as opposed to the emerging market “pull”, hypothesis. This relationship is statistically significant, as displayed in Table 2. A one percentage point increase in the US real rate decreases capital flows in the subsequent year by about 20 billion 1995 dollars. Of course, this effect is very imprecisely estimated, and disaggregating to components leads to even greater imprecision. Net direct investment and portfolio flows exhibit even less of a tight relationship to real rates, as illustrated

⁷ See for instance Borensztein and Reinhart (1994), as well as Dornbusch (1985).

⁸ Defined as an abrupt reversal in capital inflows to emerging markets, or “sudden stop”, surprise announcements and a leveraged common creditor (Kaminsky, Reinhart and Vegh, 2003: 54-55).

⁹ Some earlier analyses include Calvo, Leiderman and Reinhart (1993) and Fernandez-Arias (1996). The latter finds that the “push” factor is more important than “pull” factors in the early 1990 resumption of lending to emerging markets. Relatedly, Dooley et al. (1994) finds that bond prices depend primarily upon developed country interest rates.

in Figures 6 and 7, and the corresponding rows of Table 3. Net other capital flows (essentially bank loans) are more reliably linked, so that a one percentage point increase in the US real rate decreases net flows by about 8 billion 1995 dollars.¹⁰

Reinhart and Reinhart (2003) note some geographical and categorical variation not illustrated in this paper. They report that net private flows do not appear to respond to the US nominal interest rate for either the Asian countries that experience financial crises, or for the other emerging Asian markets. For the former group, sub-categories of direct investment and portfolio flows respond significantly, while for the latter, only direct investment responds. Across regions, the relationship of direct investment to interest rates is the strongest, statistically speaking, and most pronounced for the Western Hemisphere, and least for Africa. The impact on net direct investment to Asia is somewhere in-between.

In sum, there are a series of well known linkages between the developed and developing countries. The magnitudes are in some question, especially as the world economy has evolved over time. Moreover, there is some geographic variation that remains to be explored. To the extent that we are concerned with, ultimately, the effect on developing country economic activity, the business cycle linkage is extensively examined in the next subsection.

A caveat is appropriate at this juncture. While the focus is on the factors that increase business cycle correlations, this should not be construed to mean that higher correlations are better. Rather, this analysis should best be thought of as being in the nature of positive analysis: a characterization of the empirical determinants of how output fluctuations are linked.

2.2 Identifying the Determinants of Business Cycle Linkages¹¹

¹⁰ Reinhart and Reinhart (2003) estimate similar regressions over the 1970-1999 period, and find considerably smaller coefficients. For instance, regressing net private capital flows (in 1970\$) on the nominal US rate, and real GDP growth, leads to a coefficient of -2.32, which after adjusting for different units, leads to a coefficient of about -9 billion 1995\$ per percentage point change. The difference may occur because the later period spanned in this

In order to analyze in a systematic fashion how various economic factors – including the strength of economic linkages between countries – influences the degree to which national economies covary, it is necessary to define the variable of interest. Two measures corresponding to two widely accepted definitions of the business cycle are utilized: the correlation between quarterly growth rates in real GDP, and alternatively, the correlation between output gaps.

What variables might be influential in determining the degree to which business cycles move together between countries? Several variables are considered, including the extent of trade flows,¹² and the dissimilarity of economic structure, as proxied by the absolute value of the per capita income differential, impediments to capital flows, and dissimilarities in monetary policy. Regarding the first variable, trade flows are themselves endogenous, reacting to other economic factors. Endogeneity is taken into account by modeling trade flows using the gravity model.¹³

There is some concern that exchange rate volatility might itself be endogenous, and perhaps to the extent that one is looking at long sweeps of low frequency (say annual) volatility, this might be the case. However, the volatility under consideration is high frequency nominal exchange rate volatility, at the monthly frequency.

The similarity or dissimilarity of macroeconomic policies could affect the degree of business cycle coherence. Two obvious instances of macro policies include monetary policy and fiscal policy. In the former case, the policy interest rate is taken to be a summary indicator of the stance of monetary policy. Because of the difficulty in sampling fiscal policies and their

analysis includes more large magnitudes.

¹¹ This section draws from results obtained in on-going research conducted with Shang-Jin Wei.

¹² This follows several other works, including most importantly Frankel and Rose (1998), Calderon, Chong and Stein (2002). Intuitively, it might seem that higher trade flows are associated with higher business cycle correlation, but theory suggests that the direction of effect depends upon the nature of trade (inter- versus intra-industry trade).

¹³ Trade flows are modeled as a function of the GDP's of the trading countries, the distance between them, and a number of other geographical variables (whether they share a common border, whether one of the countries is landlocked, or is an island), as well as other institutional variables (whether the countries share a common language, or one was a former colony of the other). In addition, exchange rate volatility is allowed to enter into the

divergences at a high enough frequency to calculate measures of similarity, fiscal policy measures are omitted.¹⁴

Finally, as pointed out by Kose et al. (2003), common shocks could be a factor in raising business cycle correlations. Consequently, in the analysis, common shocks will be modeled using time fixed effects.

2.3 Empirics

The sample examined encompasses 47 countries, over the 1980-2000 period. These countries by and large comprise the top ranked countries in terms of GDP. Business cycle correlations are calculated over windows of 3 or 5 year periods, although only results based upon the former window are reported. The business cycle variables are calculated using quarterly GDP data, while exchange rate and interest rate volatility variables are calculated using monthly data. While the GDP growth rate is easily calculated, the construction of the output gap is a contentious issue. It is not possible to rely upon national sources for the measures of potential output necessary to calculate the output gap, since many countries do not calculate such series. Furthermore, it is not feasible to try to calculate potential output using capital stock and labor stock data for many countries since the requisite series would not be available. As a consequence, the Baxter-King band pass filter is used to extract low frequency variations in GDP, and equate this measure with trend or potential output.

In Figure 9, the average business cycle correlations (measured using output gaps) between the G-7 countries and two groups of countries: all the non-OECD countries in the sample and the East Asian countries, ex-Japan. The graph illustrates the fact that the average

determination of trade flows (and hence indirectly into the coherence of business cycles).

¹⁴ Kose et al. (2003) do not find that fiscal policy similarity measures have a significant role in determining business cycle correlations.

¹⁵ As the discussant, Stijn Claessens, noted, the use of correlations is problematic when variances increase, as in

correlations¹⁶ for the developing countries group have been fluctuating over most of the last 20 years, with a marked upward surge in 1998-2000. The increasing correlation between the East Asian countries and G-7 output is also documented by Kim et al. (2003).

Trade variables and gravity variables are measured at annual frequency. Note that the trade variables have to be normalized somehow. One way is to normalize bilateral trade flows (the sum of exports and imports) by the total trade flows. The second way is to normalize by GDP (either expressed at official exchange rates or in purchasing power parity terms).

The data set encompasses almost all OECD countries, and the largest countries (by GDP) outside of the OECD, plus most East Asian emerging markets. Hence, the data set expands upon the coverage of OECD-specific studies such as Imbs (2003), although at the cost of less detail on sectoral aspects. Greater detail is contained in the Data Appendix.

In order to address the question at hand of how do developed country economic conditions and policies affect developing country conditions, one has to take a stand upon what constitutes a developed economy. One possibility is to take the OECD countries as a grouping, but this set of countries has changed over time, and it is not clear whether Korea, Mexico and Turkey should be considered developed countries. Hence, define the G-7 as the set of major advanced economies, and categorize the non-OECD countries plus Korea, Mexico and Turkey as the set of emerging and developing economies.

As indicated in Table 4, the relationship between business cycle correlations and trade links is not statistically significant when using growth rates as the dependent variable (columns [1] and [2]). This pattern is partially replicated even when using the output gap as the measure of the business cycle. Only when trade flows are normalized by GDP does it appear that business

times of crises; see for instance the work of Forbes and Rigobon (2002).

¹⁶ Average correlations estimated by running a regression of relevant correlations on time dummies.

cycle correlations are determined by trade links, irrespective of whether the endogeneity of trade flows is accounted for or not (columns [3]-[6]). In other words, the results are clearly not robust.¹⁷

The contrast between the results for the G-7 and emerging/developing country links and for the entire set of links suggests that other factors become important when examining these connections. One possibility is that the business cycles linkages are mediated by differing economic structures. Imbs (2003) and Calderon, Chong and Stein (2002) have measured the dissimilarity between economic structures by differences in shares of output in individual sectors for the OECD countries. In this analysis encompassing many emerging and developing countries, this procedure is too cumbersome,¹⁸ and I choose to proxy this structural dissimilarity as the absolute value of the percentage difference in per capita income (expressed in PPP terms).

Augmenting the business cycle-trade regression with a proxy variable for specialization yields a negative coefficient on the specialization variable. Hence, countries more dissimilar in GDP have lower business cycle correlations, after controlling for trade linkages (columns [7] and [8]). This coefficient is never statistically significant in this sample, although it is in other samples (such as OECD vs. non-OECD).

There are (at least) two other factors that could influence business cycle correlations. The first is the similarity of monetary policy. This is a difficult aspect to measure – especially since indicators of monetary policy have varied over different periods and countries.¹⁹ The standard

¹⁷ In fact, the statistical significance is probably lower than that suggested by the t-statistics, since there is the possibility that the observations are not independent across observations. Some of this cross-pair correlation is mitigated by the use of fixed time effects.

¹⁸ Imbs (2003) can rely upon disaggregated data for the OECD countries, while Calderon et al. (2002) use only the sectoral shares at the beginning of the sample, and so only generate this sectoral difference variable once for each country. As noted by the discussant Stijn Claessens, the measure used in this paper would only indirectly capture the commodity orientation of an economy like, for instance, Indonesia.

¹⁹ Another measure would be the fiscal impulse. It would be difficult to obtain a consistent measure across all the time periods and countries in this sample. Moreover, Kose et al. (2003) find that the budget surplus to GDP ratio

deviation of interest differentials – expressed in decimal form – is used as a measure of monetary policy differences. Including this variable directly leads to insignificant coefficients in all cases. However, this variable exhibits extremely wide variations because of several cases of countries experiencing hyperinflation during the 1980s. As a consequence, the sample is censored to eliminate standard deviations of differentials in excess of 50 percentage points. When this step is implemented, one obtains the results in columns [9] and [10].

In this specification, trade flows are significant once again, and so are interest differential variabilities. A ten percentage point increase in the standard deviation of interest rate differentials (at the monthly frequency) results in a decrease of the business cycle correlation of 0.16, a rather substantial change. Of course, it is important to note a 10 percentage point change in the standard deviation of the differential is a large change in itself – this shift is the same as the shift from the UK-Thailand volatility over the 1998-2000 period to the UK-Turkey volatility over the 1989-92 period (2.6 ppt to 12.2 ppt).²⁰ Note that this finding is merely a characterization of the effects of monetary policy convergence; it may be desirable to have lower business cycle correlations. If that were the case, then one can view the results as highlighting the possibility of using monetary policy to insulate economies from other countries' policies.

The second factor to consider is the effect of capital controls. To the extent that capital controls impede the movement of capital, fluctuations in the rate of return to capital may not be as easily transmitted across borders as otherwise (see section 2.3 below for additional details). There are many different measures of capital controls, but we use one that covers maximizes coverage of many countries: the Chinn-Ito (2002) index. This index is the first principle component of all four of the indicator variables the IMF compiles on exchange restrictions,

fails to exhibit much explanatory power, so we avoid this measure.

²⁰ Reverse causality is a plausible alternative interpretation of this correlation. It could be that country-pairs with

restated so that higher values indicate greater financial openness.²¹ The simple average of the two countries' financial openness is entered into the specification.

Business cycle correlations do not seem to be robustly related to the degree of financial openness, as measured by the Chinn and Ito index. Only when the medium and high inflation countries are omitted by requiring interest differential volatilities to be below 5 percentage points does one obtain a statistically significant role for financial openness. Then, the interest rate volatility variable exhibits a perverse sign.

Taking at face value these estimates for the financial openness variable, one finds that a one unit increase in financial openness increases the business cycle correlation between a G-7 economy and a developing economy by between 0.05 and 0.06. Since this index is in some ways “unitless” it is helpful to consider an example of a one unit increase in the average financial openness. For instance, the degree of openness between Brazil and Thailand over the 1998-2000 period, and Israel and Thailand during 1998-2000 differs by “one unit”. So holding all else constant, the Brazil-Thailand and Israel-Thailand business cycle correlation should differ by about 0.05.

In summary, business cycles in the less developed economies are connected to those in the major industrialized economies. The strength of these connections depends upon a variety of factors, some of which are not easily influenced by policy. In this category one can include the similarity of production structures. On the other hand, the extent of bilateral trade flows is somewhat affected by policy, especially regarding tariffs and nontariff barriers. And the regulatory dimension of financial openness is clearly policy-determined.

lower business cycle correlations adopt more divergent monetary policies.

²¹ See Edison et al. (2002) for a description of other measures of capital controls.

Can one draw some specific conclusions regarding the linkages of the East Asian developing economies? Unfortunately, restricting the sample to the East Asian countries reduces the sample size by over half, so that the precision of estimates falls considerably. A typical regression yields a statistically insignificant coefficient on the trade variable, with the sign equally likely to be positive or negative. The results improve somewhat when Singapore, an outlier in terms of trade, is excluded. The resulting estimates for the trade variable coefficient are slightly lower than those for the entire developing country sample. Interestingly, while the monetary policy and specialization (per capita income difference) variables are not statistically significant, the financial openness variable does exhibit statistical significance in the specifications it is included in. This suggests that the business cycles linkages for East Asia have a stronger financial component than for the overall set of linkages.²²

2.4 Implications

The estimates suggest that for the developing countries as a group, the tight linkage in business cycle correlations means that the rapid growth developed country over the 1990s resulted in more rapid growth in the less developed economies. However, the results for East Asia are less definite; in particular, trade does not appear to be a statistically reliable determinant of business cycle synchronization (although the estimated economic magnitude of the effect is not that much smaller, at roughly 2/3 that for all links). Rather policy measures such as financial openness appear to be the only statistically important factor.

These results suggest that financial opening, combined with rapid economic growth in the G-7 economies, served to sustain economic growth in the region during the last decade and a

²² For instance, in the specification corresponding to column [11] of Table 4, the coefficient on GDP normalized is 0.04, versus 0.06. The coefficient on the financial openness variable is 0.07 (significant at the 10% level) versus

half. The growth in trade links likely also supported this phenomenon, although this conclusion is not strongly supported by the data.

3. Financial Linkages

3.1 Literature Review

One can view the financial linkages from both the perspective of stocks and flows, and asset prices. Some of the evidence regarding the flow-based linkages was recounted in Section 2.1. Here, the focus is on asset price linkages, broadly construed.

There is a voluminous literature on this subject, a large portion of it dealing with highly liquid debt instruments. It would be impossible to do a survey of just the work on emerging markets, but a few key references would include Frankel and MacArthur (1988), Chinn and Frankel (1994), Bansal and Dahlquist (2000). Another substantial literature deals with equity prices in emerging markets; a useful survey of this subject is contained in Bekaert (2002).

To provide some feeling for the magnitude of the effects, particularly how much developed country asset prices affect asset prices in developing countries, consider the following set of results. Frankel and Roubini (2003) find that the IFC Global index of equities declines by 17 ppts for each one ppt increase in the real G-7 interest rate, while the Emerging Markets Bond Index (EMBI) declines by 34 percent (similar magnitudes are obtained if one uses the real Fed Funds rate instead of the G-7 real rate).

These effects are quite large, especially once one considers that the effect on the S&P500 drops only about 16 ppts for a one ppt increase in the real Fed Funds rate. Frankel and Roubini

did not examine the impact of changes in US equity indices, but presumably there are high correlations there as well.

In order to identify the strength and determinants of primarily financial linkages, the analysis is now focused on correlations in asset prices on a country by country basis.

3.2 An Extensive Cross-Country Analysis

This section reports results from Forbes and Chinn (forthcoming), a study that examines if real and financial flows and stocks between countries can explain why the world's largest financial markets often appear to have such large, yet varying, effects on other financial markets, and how these cross-market linkages have changed over time

In order to answer these questions, Forbes and Chinn estimate a factor model of market returns in different countries. It assumes that a country's market returns are a function of global factors (global interest rates, oil prices, gold prices, and commodity prices), sectoral factors (stock returns for 14 sectoral indices), cross-country factors (returns in other large financial markets), and country-specific effects. They focus on the estimated cross-country linkages between the five largest economies (France, Germany, Japan, the U.K. and U.S) and about 40 developed countries and emerging markets around the world, over the 1985-2000.²³ Their analysis then involves relating these cross-country linkages into four specific bilateral linkages, two of which are real (direct trade flows and competition in third markets²⁴) and two of which are financial (bank lending and foreign direct investment). In addition, they augment the specifications with capital controls.

²³ Note that since the linkages are measured as regression – not correlation -- coefficients, the volatility of the right hand side variables does not affect the statistic of interest.

²⁴ The competition variable takes into account product overlap at the four digit SITC level. See Forbes and Chinn (forthcoming) for details.

The most consistent finding in Panel A of Table 5 is that the coefficient on import demand is positive and highly significant (at the 5% level) in determining the correlation of dollar denominated stock returns. This suggests that on average between 1986 and 2000, direct trade may have been the most important bilateral linkage determining how shocks to the world's largest economies affected other stock markets. The estimated coefficients on bank lending are positive, although usually insignificant. The results regarding trade competition and foreign investment fluctuate are less robust, so definite conclusions are difficult to make regarding these variables. This same pattern of results is repeated when returns are measured in local currency terms.

In order to investigate whether the importance of factors has changed between 1986 and 2000, we divide the full sample period into 3 sub-periods of equal length: 1986-1990, 1991-1995, and 1996-2000. The results for these 5 year average periods are reported in Panel B.

The coefficient estimates indicate that there were substantial changes in the importance of the bilateral linkage variables in the different sub-periods. In the earlier two periods (from 1986-90 and 1991-95), most of the coefficient estimates are insignificant, and of those that are significant, none are robust across the specifications. Not only does the coefficient significance vary across specifications, but even the estimated signs show a remarkable lack of stability. Not surprisingly, the proportion of the variance explained by the models in both of these periods is very low.

Estimates during the later period from 1996-2000, however, reflect very different patterns. There is a dramatic increase in the model's explanatory power, with the proportion of the variance explained now increasing to 12-21%. There is also a substantial increase in the consistency of some of the estimates across the different specifications. The most noteworthy

change is that the coefficient on Import Demand is always positive and significant (usually at the 5% level).

Focusing on global linkages in bond markets instead of stock markets, one is confronted by the fact that the data availability for bond markets (especially for local currency bonds) is much more limited. Therefore, Forbes and Chinn focus on estimates from 1994-2000.

The results, reported in Table 6 for both dollar denominated bonds (Panel A) and local currency denominated bonds (Panel B), indicate that bond links are determined by import demand, although trade competition also matters (negatively, as it turns out).

Given the delimited extent of the data span, it is more difficult to assess the evolution of the linkages over time. There is some evidence that the strength of the linkages is easier to detect in the 1998-2000 period, suggesting that for bond markets the linkages are growing stronger over time. However, given the short sample span – less than one business cycle -- it would be foolhardy to make inferences.

To the extent that East Asian economies are becoming increasingly linked with the G-5 economies through higher levels of trade, one should anticipate that the correlations in asset prices, after accounting for global and sectoral factors, will be rising.

4. Exchange Rate Variability

4.1 G-3 Exchange Rate/Interest Rate Variability Tradeoffs

It seems intuitive that large swings in the values of the major currencies should be avoided for a number of reasons. For instance, shifts in currency values force adjustments in trade patterns that may incur large adjustment costs. But when analysts argue for the stabilization of currency values, they typically have in mind other arguments, related more to the problems

that occur as incompletely hedged firms and governments are confronted by radically different relative prices. In that sense, one can think of the volatility in major currency exchange rates as affecting the emerging markets mainly through the increase in uncertainty surrounding the terms of trade, the current account, and capital flows.

As a consequence, several authors have investigated the benefits of target zones for the major currencies.²⁵ However, it remains an open question whether the management of exchange rates can be achieved without a commensurate increase in volatility among other important macroeconomic variables.²⁶

For instance, target zones have long been viewed as means of eliminating unwanted exchange rate variability. Sometimes, the mere commitment to a target zone is viewed as bringing stabilization, as long as the commitment is credible.²⁷ Older analyses suggested that sterilized intervention could be used to influence exchange rates (see Dominguez and Frankel, 1993). In more recent studies (e.g., Flood and Rose, 1995; Jeanne and Rose, forthcoming), the existence of noise traders suggests that elimination of variability in exchange rates need not cause a transference of volatility to another market.

Still, the Flood and Rose argument applied with greatest persuasiveness to cases wherein the switch was from a managed float to a hard fix. For the major currencies, it seems unlikely that they are soon to give up their monetary autonomy. Hence, one is left with the question of whether it would make sense to stabilize exchange rates. This question cannot be directly answered without reference to what impact on other conditions might occur as a consequence of exchange rate stabilization.

²⁵ Clarida (2000) provides an extensive survey of the topic.

²⁶ One could also argue for interest rate stabilization, on similar grounds. However, to the extent that interest rate parity conditions hold, minimization of interest rate variability might require more variability in other asset prices.

²⁷ The key references are Krugman (1991) and Froot and Obstfeld (1991).

Reinhart and Reinhart (2003) make the tradeoff explicit in the context of a small north-south model of the world. In the absence of noise trader, portfolio balance and signaling effects, exchange rate stabilization can only be achieved at the cost of higher interest rate variability. How to measure the resulting costs to the developing countries is a contentious issue, but they evaluate this using as their metrics net capital flows, and developing country growth. On the first count, they conclude that the resulting changes in capital flows from stabilizing exchange rates are sufficiently small to make the choice a toss-up.

On the second count, they obtain a slightly more ambiguous result – that indeed higher G-3 exchange rate volatility is associated with somewhat higher incidences of banking and currency crises. While they reach a different conclusion, this result seems to keep the question of G-3 exchange rate stabilization an open one.

4.2 The Interaction of East Asian Dollar-Targeting and Dollar Variability

The general issue of G-3 exchange rate variability has a particular resonance in the case of East Asia. As pointed out by several recent studies, the East Asian economies have largely – although not completely – restored their earlier policy of pegging largely against the US dollar, documented by Frankel and Wei (1994).²⁸ Indeed, the substantial accumulations of dollar assets on the part of several East Asian central banks is testimony to the fact that management against the dollar has been explicitly aimed at keeping their currencies at lower values than they would have achieved in the absence of intervention (see Hernandez and Montiel, 2001).²⁹ To a large

²⁸ See McKinnon and Schnabl (2003). Kawai (2002) argues that Thailand and Korea have moved toward a basket peg. The deterioration in Argentine competitiveness during the 1996-2001 dollar appreciation also highlighted the danger of being on a dollar peg when most of the trade flows are not with the United States.

²⁹ The motivation for these policies is a subject of debate. Indeed, there may be a multiplicity of rationales, varying in importance over time. In the immediate wake of the East Asian crises, the primary motivation was probably self-protection, while in more recent times the desire to maintain export demand was probably of greater importance.

extent, this intervention made sense insofar as policymakers wished to avoid premature currency overvaluation that might have endangered economic recovery.

It is this combination of dollar variability against the yen and euro (and prior to the euro's inception, the deutschemark) and pegging against the dollar that is the focus of attention. There are two questions that arise specifically in the context of East Asia. First, were the crises of 1997-98 attributable to the dollar's 40 percent appreciation against the yen over the preceding two years? Second, more generally, does bilateral exchange rate variation induce excessive variability in East Asian terms of trade?

On the first point, one can see this critique in a number of studies (Ito, et al. (1998); Ogawa and Ito (2002); Kuroda and Kawai (2003)). In contrast, Frankel and Roubini (2003) cast doubt upon this thesis. They point out that the dollar appreciation occurred in the context of a snapback from an unusually low value of the dollar against the yen. Hence, the overvaluation thesis is in dispute.

In addition, while there were some competitiveness effects,³⁰ the debt denomination effects worked in the opposite direction, to the extent that some of the developing country liabilities were denominated in yen.³¹ Hence, there is no *prima facie* case that dollar/yen appreciation was the core cause of the 1997-98 financial crises.

On the other hand, the rapid movement in the dollar/yen rate, post-1995, may have increased risks for firms and consumers in the East Asian economies. Thus, looking forward, there is the interesting policy question of how sensitive East Asian exchange rates are to variations in G-3 bilateral exchange rates. In this case, it is important to consider what the

³⁰ There remains a real question as to whether there was a substantial degree of overvaluation. See for instance the estimates by Chinn (2000), and the arguments by Furman and Stiglitz (1998), that argue that the overvaluations were not key to the currency crises. On the other hand, others have recently maintained the existence of large overvaluation; see Rajan et al. (2002).

important variable is; in the narrow case of competitiveness, the relevant variable is the real *effective* exchange rate.

In order to answer this question, the correlations between changes in bilateral dollar exchange rates and changes in the real effective exchange rates of several East Asian economies over the 1990-2003 period are investigated. These effective exchange rate series, constructed by JP Morgan, are displayed in Figures 10-12 (in levels, rescaled to 1990m01=100).

Negative coefficients indicate that a dollar depreciation against the yen or euro results in a weakening of the local currency. A caveat is necessary at this point. The regression coefficients obtained are clearly not structural parameters. Rather they are the quasi-reduced form coefficients relating the real effective rate to the bilateral rates, assuming the bilateral rates can be considered exogenous (a point returned to further below). These coefficients are reported in Table 7. Panel A reports the results for the economies that suffered a financial crises during 1997-98, while Panel B reports those for the other East Asian countries.

The results in Panel A, over the full sample, fail to validate the view that dollar/yen movements dominate in changes of local rates. Of course, it is particularly hazardous to make inferences regarding nonstructural parameters over a long sample involving structural breaks. Hence, attention is restricted to the period prior to 1997m06. These results generally confirm the impression that over the period prior to the currency crises, movements in the dollar had a large impact on trade weighted exchange rates. In most cases, a dollar depreciation (indicated by a rise in s) is associated with a decline in the trade weighted value of the local currency, q). Interestingly, variations in the dollar-yen rate had a less pronounced effect than those in the dollar-euro rate. For Thailand, ten percentage point increase in the rate of dollar appreciation against the euro, the rate of effective baht appreciation increases by 1.8 percentage points. And a

³¹ Whether most of Japanese debt was denominated in dollars or yen remains an open question.

ten percentage point increase in the dollar appreciation against the yen causes an increase in the rate of baht appreciation of less than one percentage point (not statistically significant at 10%). The results for Korea are somewhat more supportive of view that dollar swings were important, with the dollar/yen rate now having a statistically significant impact. However, the effect is still less pronounced than for shifts in the dollar/euro rate.

In general, the evidence fails to support the view that the dollar appreciation against the yen resulted in a substantial worsening in competitiveness for the crisis countries. This is not to say that dollar appreciation was unimportant; rather, dollar appreciation against the euro, rather than the yen, seems to be a more important determinant of changes in East Asian competitiveness. In the wake of crises, it appears that these patterns have, if anything, persisted.³²

Needless to say, these results will be something of a surprise to many observers of East Asian economic events. One part of the reason for these diverging results is that some of the earlier series commonly used in analyses did not account for trade with China.³³

Regardless of the lessons that might or might not be drawn from the events during the run-up to the East Asian crises, it is of interest to see what the response of other East Asian effective exchange rates to dollar changes is. Panel B reports analogous results for the non-crisis countries. There is even less evidence of a role for dollar/yen shifts.

As a robustness test, the analysis is redone using the series calculated by Deutsche Bank.³⁴ The Deutsche Bank series differ from the JP Morgan series in that the export weights do

³² Note that these results pertaining to the impact of the dollar/yen rate are not sensitive to omission of the dollar/euro exchange rate.

³³ Up until 2003, the indices used 1990 trade weights omitting China (see Hargreaves and Strong, 2003). Regressions using these earlier vintage series find a greater role for shifts in the dollar/yen rate.

³⁴ The characteristics of these indices are described in Spencer and Wong (2002). They do not take into account third market export effects.

not account for third market effects. The results reported in Table 8 provide even less evidence of a critical role for shifts in the dollar/yen rate in the years leading up to the East Asian crisis.

Naturally, a country on a hard, unadjustable, peg would be most influenced by dollar exchange rate variations, and the Hong Kong dollar is clearly linked to the US dollar/euro rate, over the entire sample. However, the links to the dollar/yen rate still appear to be much weaker. Overall, the instances of significance for the dollar/yen rate are very few, and in fact go in an unanticipated direction in certain cases (the Singapore dollar). Prior to the East Asian crises, only the Philippines peso appreciates faster when the dollar depreciates more rapidly against the yen.

One particularly interesting result is that the Chinese yuan does respond by appreciating faster when the dollar appreciates, against either the euro or the yen. A ten percentage point depreciation of the dollar against the euro(yen) causes a two(one) percentage point depreciation of the RMB in the period after the East Asian crises. Hence, the yuan is the currency that best fits the view that movements in the dollar/yen rate have a large impact on the competitiveness of the local currency.

While the conventional effective exchange rate indices take into account the share of trade associated with each trading partner, they fail to allow for the possibility that trade flows associated with differing trade partners might have different price sensitivities. This factor might be important, as suggested by Fernald, Edison and Loungani's (1999) examination of whether China's 1994 exchange rate unification caused the East Asian currency crises three years later. Further evidence is provided by the results of Spilembergo and Vamvakidis (forthcoming). They find that export equations fit better when differing degrees of substitutability are allowed between intra-OECD and intra-non-OECD exports.

It would be of interest to examine whether these conclusions hold up when one uses an exchange rate index that does account for the degree of substitutability between flows of trade originating from different countries. Unfortunately, to my knowledge, a set of such indices does not exist.

However, attempts have been made to infer the appropriate weights using regression analysis. Estimates by Spencer and Wong (2002) suggest somewhat smaller weights upon the Japanese yen than simple bilateral trade flows would indicate. For instance, in their simple trade weighted index for China, Japan has a 0.22 weight, while the weights based on bilateral competition and estimated elasticities suggest a weight that is no greater than 0.10. As a consequence, they conclude that movements in the Japanese yen/US\$ exchange rate have much less impact than that implied by conventional measures.

One question that arises is whether the findings at the monthly frequency are relevant. Most of the critiques of the implicit dollar pegs in effect prior to the 1997 crises centered on long-duration misalignments associated with long swings in dollar rates. Such effects may be difficult to discern using monthly changes. In order to see if the results are sensitive to the data frequency, the analysis is repeated annual changes in the exchange rates. The results are broadly similar to those obtained before: dollar/yen exchange rates do not typically have the anticipated effects on trade weighted exchange rates.

4.3 Implications

The findings reported above should not be construed as evidence that changes in dollar movements are unimportant. Rather, they indicate that the impact on competitiveness is not always in the direction that is expected. In instances where the dollar movements -- against the

euro or the yen -- are important, then it still might be the case that alternative nominal anchors should be considered.

For instance, Kawai and Takagi (2002) have recommended moving to a managed float with a G-3 currency basket peg as the central rate. Williamson (1999, 2001) also suggests pegging to a basket, but incorporating a crawling band. He emphasizes the fact that the nominal external anchor is to be used in conjunction with a monetary policy of inflation targeting.³⁵ The need for such an adjunct to inflation targeting is probably higher if exchange rate pass through is fairly high.³⁶

Finally, it must be recalled that these correlations merely reflect an amalgam of current policies, shocks, and trade weights. They are useful to validate the impact of past and current policies. But obviously, they are not structural parameters, and should not be construed as restricting policy choices. If these countries choose to, they can simply de-link. Why they choose not to do so has been examined elsewhere much more thoroughly.³⁷

5. Regulatory Initiatives and Efforts to Reform the International Financial Architecture

5.1 Reforms of the International Financial Architecture

There have been a plethora of initiatives to reform the international financial system, ranging from increases in consultative groups, such as the Group of 20, agreements to increase

³⁵ See also Bird and Rajan (2002). A general argument for “inflation targeting plus” is presented by Goldstein (2002). For critiques of currency basket arrangements, see DeBrouwer (2000) and Frankel (2003). Frankel proposes “pegging the export price” (PEP).

³⁶ It does appear that pass through is higher for emerging markets than for developed economies. However, the East Asian economies typically have lower pass through coefficients than their Latin American counterparts. See Choudhri and Hakura (2001) as reported by Co and McCauley (2003).

³⁷ See Calvo and Reinhart (2000a, b) in particular. Hausmann et al. (2000, 2001) and Goldfajn and Olivares (2001) also discuss this issue.

transparency in data provision by countries and decision-making by international financial institutions, as well as moves to increase BIS capital adequacy standards (more on this below). Finally, there has been a renewed interest in “bailing-in” the private sector, so that they bear the costs and risks of investing in emerging markets. A comprehensive discussion of these topics is clearly beyond the scope of this paper. For an excellent discussion of many of these issues, see Frankel and Roubini (2003).

The following discussion centers on initiatives and findings that have occurred over the last five years. The first is the attempt to mitigate the high costs associated with “sudden stops” and the resulting financial crises and attendant heavy financial costs³⁸ by modifying the terms under which sovereign debt is incurred. The second is the attempt to implement new regulations to reduce the likelihood of financial sector crises that seem to be attendant with these crises.

One major initiative in regard to the first was the effort to establish an international bankruptcy system to accelerate an orderly workout of international debts when a developing country falls into an extreme indebtedness crisis. This means that debt relief often needs to be an integral component of “rescue” packages in order to encourage creditor-debtor bargains to stretch out loans, convert debts to equity, and occasionally a permanent write down of claims. Private creditors should bear the major burden for renegotiating the timing and repayment terms on existing debts when a financial crisis emerges.

Such initiatives can be placed into two broad categories: contractual and statutory. Under the first grouping, one can locate proposals for a sovereign debt restructuring mechanism (SDRM), such as that forwarded by first deputy managing director Anne Krueger (2002a,b). Her proposal would have established a US style court-based approach to restructuring sovereign debt,

³⁸ “Sudden stops” are analyzed by Calvo (2002). Hutchison and Noy (2002) empirically assess the cost of these crises.

operating under the auspices of the IMF, and enshrined in the IMF's Articles of Agreement. However, as early as mid-2003, it was clear that the proposal lacked the key support of the U.S. government. Movement along this path thus appears to be at a standstill.

By default, it appears the second route will be the route adopted: that is the inclusion of "collective action clauses", which lay out how defaults are to be handled. Eichengreen (2003) discusses some of the details of how such clauses could be incorporated into bonds. To the extent there is a proposal for a systematic implementation of "private sector involvement", the encouragement of CACs is the concrete manifestation.

Interestingly, in contrast to the proposal for a SDRM, there is already some empirical evidence on this topic, since bonds issued in London already incorporate such clauses. One interesting question, aside from whether welfare in borrowing countries would actually increase,³⁹ is the distributional effect. Eichengreen and Mody (2001) found that when collective action clauses are included, then low risk countries face a lower interest rate, while high-risk countries face higher rates, while others have failed to obtain similar results for high-risk countries.⁴⁰

It is unclear what the implications are for the newly industrializing and developing countries of Asia, as distinct from those pertaining to all developing countries. To the extent that most of the East Asian economies are less risky than countries in Latin America, South Asia and Africa, these governments will tend to face lower interest rates, if the Eichengreen-Mody results are accepted.

³⁹ While it would seem obvious that easier resolution of debt defaults, and avoidance of the resulting financial crises, would result in smaller welfare losses, some have argued that the costs associated with the defaults are part of the disciplining device which enables borrowing to occur. See Dooley (2000).

⁴⁰ See Becker, Richards and Thaicharoen (2001).

Furthermore, East Asia stands apart from many other parts of the emerging world in one key sense. At the current time, liquidity does not seem to be an issue in the region; outside of China, investment remains at depressed levels. That situation may of course change, if another crisis should strike the region's economies. Indeed, that is the contingency that the Chiang Mai Initiative (CMI), a regional swap arrangement, is aimed at addressing.⁴¹ However, there do not appear to be any corresponding initiatives being undertaken at the global level, such as the Supplemental Reserve Facility (SRF). The already existing Contingent Credit Line (CCL) facility of the IMF is essentially moribund; no country has actually accessed this facility.

5.2 Regulatory Changes: The Basel II Standards

One imminent change in the international regulatory framework is the implementation of new capital adequacy standards for international banks.⁴² The objective of this initiative is to reduce the tendency toward risky lending, a clear lesson from the East Asian crisis. Still, there are a myriad of concerns attendant with this establishment of these new standards. For the purposes of this review, one key concern surrounds the additional procyclicality induced by the new standards.

To understand this concern, note that in a static context, it makes a lot of sense to calibrate the required capital reserves to the riskiness of the bank's total loan portfolio. However, what makes sense for an individual bank at a given time may not have unintended consequences over time. The riskiness of loan portfolios generally rise in times of economic stress, such as

⁴¹ The Chiang Mai Initiative is a regional financing network introduced by the ASEAN countries plus China, Japan and Korea (often termed the ASEAN+3) in May 2002. Technically, the initiative is an expansion of the ASEAN swap arrangement to pool dollar reserves to include the three newcomers. The objective is to improve the countries' ability to guard against bouts of financial speculation. See Ito (2004) for a brief review. For a broader discussion of regional initiatives, see Kawai (2004) in this volume.

⁴² See Basel Committee on Banking Supervision (2003).

recession, and so bank lending will tend to fall exactly at such times. This means for the overall economy, bank loans are made even more procyclical by the implementation of the standards.

Kashyap and Stein (2004) conduct some simulations and conclude that under certain assumptions, the Basel II standards might induce substantial additional procyclicality. They argue that as a consequence, it might be useful to adjust the capital standards by some index of macroeconomic conditions.

6. The Implications for the Adjustment Process

The links between the developed and developing economies are strengthening along a number of dimensions. The causes of this phenomenon are unclear, although the empirical analysis suggests that the increasing magnitude of trade flows is a key factor. To the extent that trade integration is proceeding apace, one should anticipate a continuation of this process, even as the mechanism whereby which this evolution takes place is little understood.

The analysis also indicates that movements in dollar exchange rates have, and continue to, strongly affect the degree of trade competitiveness of the East Asian economies. However, the ordering of effects is not always as anticipated. The evidence that dollar/yen fluctuations have the largest impact on the region's terms of trade is not firmly established, either for the pre-1997 period, or the post-crisis era. Consequently, the competitiveness-based arguments for stabilizing either G-3 exchange rates, or for East Asian countries adopting currency baskets, remain incomplete.

Finally, the efforts to reform the international financial architecture have made some progress over the last few years, especially in the areas of establishing consultative fora, but large, substantive changes have yet to be implemented. Other reforms, including the Basel II

accord, may very well improve the microeconomic efficiency of international banks, but may also have unintended macroeconomic effects.

What implications for the adjustment process can one draw from this analysis? One key aspect of the findings is the sensitivity of the East Asian economies to developments in the G-7 economies, and perhaps most importantly, the United States. Hence, any discussion must address the prospects for the US economy.

With the US trade deficit in excess of 5 percent of GDP, it is clear that at some juncture, some decline of the deficit must occur. However, this long awaited development has failed thus far to materialize, despite a substantial drop in the trade weighted value of the dollar since 2002. In part, this is due to the relative insensitivity of US trade flows to the real exchange rate (Chinn, 2003). But in addition, the revival of American economic growth during the first quarter of 2004 has served to partly offset the effects of the dollar depreciation.

Given current views of likely trends in growth around the world, it is difficult to see how the adjustment will proceed.⁴³ Indeed, with US short term interest rates likely to rise over the next year, adjustment may proceed even more slowly than anticipated. That is because higher real rates in the US will tend to increase capital inflows to the US (as discussed in Section 2), and raise the value of the dollar. This prospect makes clear why it is ever more urgent for the United States to set forth on a path of fiscal consolidation, in order to reduce the demand for world savings, and mitigate the upward pressure on real interest rates.⁴⁴

If fiscal policy were returned to a more responsible mode, then a relatively smooth adjustment could be effected, as long as sustained growth resumes in the euro area and Japan.

⁴³ Although some have argued that the financing of the US current account deficit can continue for many years. See Dooley, Folkerts-Landau and Garber, 2003.

⁴⁴ For a detailed analysis of the role of US fiscal policy in determining long term real interest rates, see Chinn and Frankel (2003).

This confluence of events could result in a soft landing in current account adjustment, as both Europe and East Asia take up more of the burden of sustaining world consumption. If in addition, European growth is driven by accelerated productivity, then the increased profitability of financial assets in the euro area could partly offset the tendency for world financial savings to flow to the United States, putting additional downward pressure on the dollar.

One major auxiliary requirement is that Japan resumes its upward trajectory; without a sustained recovery based on domestic consumption, East Asian trade will falter. Recent domestically-based growth provides hope that the US current account adjustment will be accommodated.

The full realization of this scenario requires, however, a willingness of East Asian governments to allow greater flexibility of their exchange rates, vis a vis the US dollar. In this sense, increased flexibility on the part of East Asian central banks, in terms of what currencies – or baskets of currencies – they target will prove essential.

The urgency of the situation is highlighted by the dire circumstances that are associated with alternative scenarios. In particular, a more precipitous decline in private sector willingness to purchase US assets could lead to a more rapid, and disruptive, re-balancing of global current account balances.⁴⁵ It is during such events that the likelihood of financial crises is greatest, and provides even greater argument for avoiding such paths.

⁴⁵ See BIS (2004, Chapter V) for three scenarios for US current account adjustment. For a slightly different perspective on how US and euro area adjustment might proceed, see IMF (2004).

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Appendix 1: Data Sources, Description and Calculation

Section 2.1

The data for GDP growth rates, terms of trade, and capital flows are drawn from the IMF's *World Economic Outlook* (September 2003) database, <http://www.imf.org/external/pubs/ft/weo/2003/02/data/index.htm> . These data are expressed in annual terms, for the following aggregates: Advanced developed countries, Major advanced countries (G-7), Developing countries, Developing Asian countries,⁴⁶ and Newly industrializing Asian countries. These categories are described at: <http://www.imf.org/external/pubs/ft/weo/2003/02/data/groups.htm> . Growth rates of GDP are expressed in constant local currency terms.

The US real interest rate is the 3 month Treasury bill rate (secondary market) adjusted by the annual CPI-U inflation rate over the previous year, using data at the monthly frequency. These series are drawn from the Federal Reserve Bank of St. Louis FRED database, at: <http://research.stlouisfed.org/fred2/> . Capital flows are converted into constant 1995\$ using the US CPI-U.

Section 2.3

This data set encompasses 47 countries, over the 1980-2000 period. These 47 countries include almost all the OECD countries, and the largest countries (by GDP) outside of the OECD, in addition to most East Asian emerging markets.⁴⁷ The annual nominal GDP data are drawn from the *World Development Indicators* while the real GDP data are drawn from the Penn World Tables. Bilateral and total trade data are drawn from the IMF's Direction of Trade Statistics. The gravity variables (distance, adjacency, common linguistic ties, island, colonial links, common colony) are drawn from Andrew Rose's website:

<http://faculty.haas.berkeley.edu/arose/RecRes.htm#Trade> . The Chinn and Ito (2002) measure of

⁴⁶ The data for the developing Asia group includes Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Kiribati, Lao P.D. Rep., Malaysia, Maldives, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu, and Vietnam.

⁴⁷ Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Canada, Chile, China, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, U.K., and U.S.

capital account openness in each country is calculated as a standardized principal component of four IMF dummy variables measuring different types of external account restrictions, with an adjustment for the length of time that the capital controls were in place. Higher value indicates greater capital account openness. This data set is available at:

<http://www.ssc.wisc.edu/~mchinn/KAOPEN.csv> .

The quarterly real GDP data used to construct the business cycle variables are drawn from IMF's *International Financial Statistics*, as well as national data sources. The growth rates are calculated as log-first differences, while output gaps are calculated as deviations from band-pass (Baxter-King) filtered data. Exchange rate and interest rate volatility variables are measured as standard deviations of monthly log-differences. The underlying data are drawn from *IFS*, with the exception of Chinese Taipei data, which are drawn from national sources.

Section 3

The data sources used in obtaining the results cited are described further in Forbes and Chinn (2003).⁴⁸ The data used to estimate the factor model of returns where stock returns or weekly bond returns are measured in either U.S. dollars or local currency, compiled by DataStream, weighted so as to be representative of all major markets in the given country. The bond data for developed countries is based on the total country return indices compiled by Morgan Stanley Capital International (MSCI) for 7-10 year bonds. The bond data for emerging markets is based on the EMBI Global total country return indices compiled by J.P. Morgan.

The four global factors are global interest rates, oil prices, gold prices, and commodity prices. The sectoral factors are weekly returns based on the Morgan Stanley Capital International (MSCI) Industrial Sector Indices. The cross-country factors are returns for the countries France, Germany, Japan, the U.K., and U.S. in the asset market corresponding to the left-hand side variable.

The GDP data used as a denominator for many of these statistics is taken from the World Bank's *World Development Indicators* (and reported in U.S. dollars). The trade data used to calculate Import demand and Trade competition is from the Statistics' Canada database. Trade

⁴⁸ The countries covered include the five major countries of France, Germany, Japan, UK and US, and the non-major countries: Argentina, Brazil, Canada, Chile, Colombia, Mexico, Venezuela, Australia, China, Hong Kong, India, Indonesia, Korea (South), Malaysia, New Zealand, Philippines, Singapore, Thailand, Austria, Belgium, Denmark, Finland, Greece, Hungary, Iceland, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden,

competition is competition in third markets, evaluated at the 4 digit SITC level; its construction is described in detail in Forbes and Chinn (2003). Bank lending is based on lending data reported by the Bank of International Settlements (BIS), measured as the total stock of bank lending from major country c in non-major country i as a share of country i GDP. Foreign investment is calculated on data from the OECD's *International Direct Investment Statistics Yearbook*, and measured as the total stock of foreign investment from country c in country i as a share of country i GDP.

Section 4

Data on trade weighted PPI-deflated real exchange rate indices drawn from J.P. Morgan and from Deutsche Bank. J.P. Morgan series downloaded from <http://www2.jpmorgan.com/MarketDataInd/Forex/currIndex.html> February 2002 (older series omitting China trade weights), and April 2004 (including China trade weights). Deutsche Bank series obtained via personal communication from Aileen Wong. Additional real exchange rate indices and bilateral nominal exchange rates drawn from the IMF's *International Financial Statistics* database, accessed April 7, 2004.

The interpretation of the regression results depend upon the method by which trade-weighting is implemented. The latest version of the JP Morgan series weights by both import and export flows, where the export weighting accounts for third market effects. This methodology is described in Hargreaves and Strong (2003). In contrast, the Deutsche Bank series do not include third country effects, and merely use as trade weights the simple average of exports and imports. On the other hand, the Deutsche Bank series use a Chinese exchange rate that is adjusted for the importance of swap transactions prior to the 1994 exchange rate unification (Fernald, Edison and Loungani, 1999) for a discussion.

Switzerland, Israel, Morocco, South Africa, and Turkey.

Table 1: Advanced and Developing Country Links

Shock	Linkage	Developing Country "Amplifier"
Advanced Country Business Cycle	(for booms)	
Income Effects	Trade Volumes (+)	High trade exposure ; high income elasticity for exports
Relative Price Effects	Terms of Trade (+)	Low price elasticity of demand (esp. commodities)
International Capital Flows	Capital flows to Developing Countries (-)	
Monetary Policy Cycle	(for expansionary policy)	
International Capital Flows	Portfolio capital flows (+)	Developed bond/equity markets and financial openness
Debt Servicing	Lower financing costs (+)	High debt levels

Source: Adapted from Reinhart and Reinhart (2003).

Table 2: Advanced and Developing Country Growth, 1980-2003

Dep.Var.	Const.	Δy	r^{US}	Adj. R^2	SER
Panel A: G-7 Countries					
All Developing	4.242*** (0.578)	0.506*** (0.159)	-0.341*** (0.122)	0.23	1.089
Developing	6.189*** (0.758)	0.474*** (0.115)	-0.168 (0.164)	0.04	1.477
Asia					
Newly	3.343** (1.268)	0.881** (0.374)	0.366* (0.212)	0.15	2.908
Industrializing					
Asia					
Dep.Var.	Const.	Δy	r^{US}	Adj. R^2	SER
Panel B: Advanced Countries					
All Developing	4.025*** (0.605)	0.553*** (0.172)	-0.341*** (0.117)	0.26	1.067
Developing	6.027*** (0.793)	0.499*** (0.127)	-0.164 (0.164)	0.04	1.471
Asia					
Newly	2.673* (1.408)	1.093** (0.414)	0.334 (0.243)	0.20	2.825
Industrializing					
Asia					

Notes: Variables expressed in percentage points. Newey-West robust standard errors in parentheses. *, ** and *** is significant at the 1%, 5% and 10% level, respectively.

Table 3: Capital Flows to Emerging Markets, 1980-2003

Dep.Var.	Const.	$r^{US}(t-1)$	Adj. R^2	SER
Net Private Capital Flows	123.81*** (26.76)	-19.49*** (6.63)	0.27	53.88
Net Direct Investment Flows	89.34*** (24.18)	-8.49 (7.03)	0.03	55.28
Net Portfolio Flows	26.96 (23.36)	-3.46 (5.57)	-0.02	37.27
Net Other Private Capital Flows	7.50 (14.38)	-7.54** (3.45)	0.03	47.48

Notes: Dependent variable in billions of constant 1995 US\$. Newey-West robust standard errors in parentheses. *, ** and *** is significant at the 1%, 5% and 10% level, respectively.

Table 4: Determinants of Business Cycle Correlations, G-7 – non-OECD links, 1980-2000

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Est.	OLS	OLS	OLS	OLS	IV	IV	OLS	OLS	OLS	OLS	IV	IV
Dep. Var.	Growth	Growth	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap
Trade Var.	Trade	GDP	Trade	GDP	Trade	GDP	Trade	GDP	Trade	GDP	Trade	GDP
Trade	-0.0132 (0.0120)	-0.0071 (0.0125)	0.0307 (0.0206)	0.0473** (0.0214)	0.0422 (0.0273)	0.0841*** (0.0283)	0.0194 (0.0264)	0.0450 (0.0317)	0.0404* (0.0279)	0.0777** (0.0062)	0.0620** (0.0312)	0.1040*** (0.0355)
Spec.							-0.0493 (0.0357)	-0.0270 (0.0409)	-0.0051 (0.0380)	0.0374 (0.0428)	-0.0278 (0.0413)	0.0061 (0.0437)
Int. Rate Volatility									-0.0158*** (0.0039)	-0.0150*** (0.0040)	0.0440* (0.0248)	0.0523** (0.0251)
Fin. Open.											0.0613** (0.0304)	0.0527* (0.0309)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.026	0.025	0.173	0.185	0.163	0.162	0.164	0.165	0.223	0.218	0.207	0.198
N	637	637	637	637	630	630	630	630	511	511	393	393

Notes: Dependent variable is business cycle correlation. “Growth” indicates that the correlation pertains to GDP growth rate correlations; “Gap” indicates that the correlation pertains to output gap correlations. “Trade” under Trade Var. Norm. indicates that bilateral trade linkages are normalized by total trade. “GDP” under Trade Var. Norm. indicates that bilateral trade linkages are normalized by GDP (calculated using PPP exchange rates). Newey-West robust standard errors in parentheses. *, ** and *** is significant at the 1%, 5% and 10% level, respectively.

Table 5: Bilateral Linkage Regressions for Stock Returns in US Dollars

Factor model with global, sectoral & cross-country factors							
Years	N	R ²	Import Demand	Trade Comp.	Bank Lend.	Foreign Invest.	Capital Controls
Part A: Full Period Average: 1986-2000							
1986-2000	161	0.07	1.715** (0.492)	-0.439** (0.209)	0.282 (0.207)	-0.064 (4.074)	-0.001 (0.017)
Part B: 5-Year Averages							
1986-1990	60	0.06	-2.074* (1.193)	0.754 (0.564)	-0.075 (0.390)	2.342 (36.788)	-0.102** (0.047)
1991-1995	104	0.03	-2.909 (2.070)	0.413 (0.672)	0.120 (0.216)	8.314 (17.143)	-0.036 (0.066)
1996-2000	149	0.18	1.932** (0.677)	-1.065** (0.232)	1.418** (0.372)	0.088 (2.656)	0.022 (0.017)

Notes: Standard errors in parentheses. *, ** and *** is significant at the 1%, 5% and 10% level, respectively. Source: Forbes and Chinn (2003).

Table 6: Bilateral Linkage Regressions for Bond Returns

Factor model with global & cross-country factors							
Years	N	R ²	Import Demand	Trade Comp.	Bank Lending	Foreign Invest.	Capital Controls
Panel A: Full Period – Dollar							
	142	0.16	3.082** (0.471)	-0.905** (0.331)	1.364 (0.828)	6.428 (5.255)	0.046* (0.027)
Panel B: Full Period – Local Currency							
	85	0.18	2.868** (0.515)	-0.595** (0.255)	0.786 (0.797)	-1.410 (3.115)	0.052 (0.065)

Notes: Standard errors in parentheses. ** and * is significant at the 5% & 10% level, respectively. Source: Forbes and Chinn (2003).

Table 7: East Asian Effective Exchange Rates and Dollar Exchange Rates

Panel A: Crisis Countries										
	Indonesia		Korea		Malaysia		Thailand			
	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥		
Full	0.169	0.095	-0.243***	0.063	-0.170***	-0.051	-0.038	-0.035		
Early	-0.251***	-0.191***	-0.244***	-0.113***	-0.187***	-0.119***	-0.178***	-0.075		
Late	0.219	0.437	-0.334**	0.089	-0.158**	-0.063	-0.004	-0.058		
Panel B: Non-Crisis Countries										
	China		Hong Kong		Philippines		Singapore		Ch. Taipei	
	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥
Full	-0.229***	-0.114*	-0.198***	-0.139***	-0.203**	-0.342***	-0.079*	0.018	-0.206***	-0.064**
Early	-0.298***	-0.025	-0.267***	-0.075**	0.022	-0.213	-0.037	-0.046*	-0.209***	-0.080*
Late	-0.176***	-0.148***	-0.131**	-0.199***	-0.079*	0.018	-0.176***	0.140**	-0.188***	-0.045

Notes: Dependent variable is real effective value of local currency. Regressions using JP Morgan trade weighted exchange rate indices. OLS estimates. *(**)[***] indicates significance at the 10%(5%)[1%] level, using Newey-West robust standard errors. ¶ indicates significant at 11% level. A negative sign indicates an increase in dollar appreciation causes an increase in local currency appreciation; a positive sign indicates an increase in dollar appreciation causes an increase in local currency depreciation.

Full Sample, 1990m02-2004m01; Early, 1990m02-1997m06; Late, 1998m07-2004m01.

Table 8: East Asian Effective Exchange Rates and Dollar Exchange Rates

Panel A: Crisis Countries										
	Indonesia		Korea		Malaysia		Thailand			
	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥		
Full	0.100	0.250	-0.238***	0.195¶	-0.143***	0.120¶	0.017	0.130¶		
Early	-0.115	0.093	-0.171***	0.028	-0.158*	-0.006	-0.136**	0.084*		
Late	0.142	0.132	-0.228*	0.266***	-0.132*	0.116	0.057	0.063		
Panel B: Non-Crisis Countries										
	China		Hong Kong		Philippines		Singapore		Ch. Taipei	
	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥	\$/€	\$/¥
Full	-0.147*	-0.140**	-0.163***	-0.054	-0.076	0.058	0.032	0.069**	-0.092**	0.057
Early	-0.095	-0.148	-0.200**	-0.012	-0.148	-0.192**	0.056	0.076**	-0.112**	0.073
Late	-0.188***	-0.122*	-0.124***	-0.067	-0.055	0.303	0.033	0.055	-0.043	0.026

Notes: Dependent variable is real effective value of local currency. Regressions using Deutsche Bank trade elasticity weighted exchange rate indices. OLS estimates. *(**)[***] indicates significance at the 10%(5%)[1%] level, using Newey-West robust standard errors. ¶ indicates significant at 11% level. A negative sign indicates an increase in dollar appreciation causes an increase in local currency appreciation; a positive sign indicates an increase in dollar appreciation causes an increase in local currency depreciation.

Full Sample, 1990m02-2004m02; Early, 1990m02-1997m06; Late, 1998m07-2004m02.

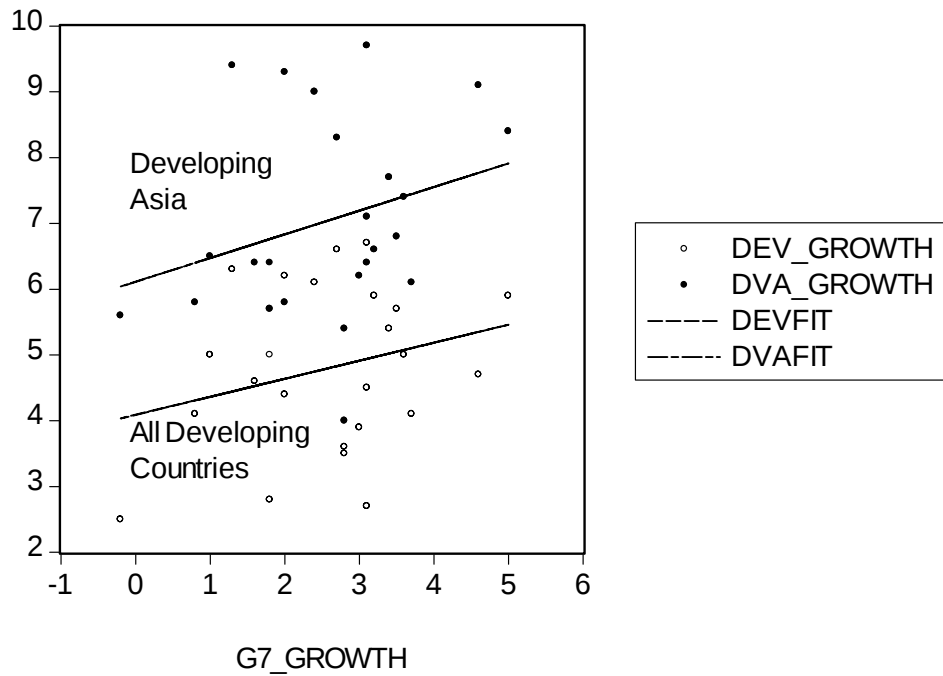


Figure 1: Growth Rates: Developing and Developing Asia against Advanced Countries

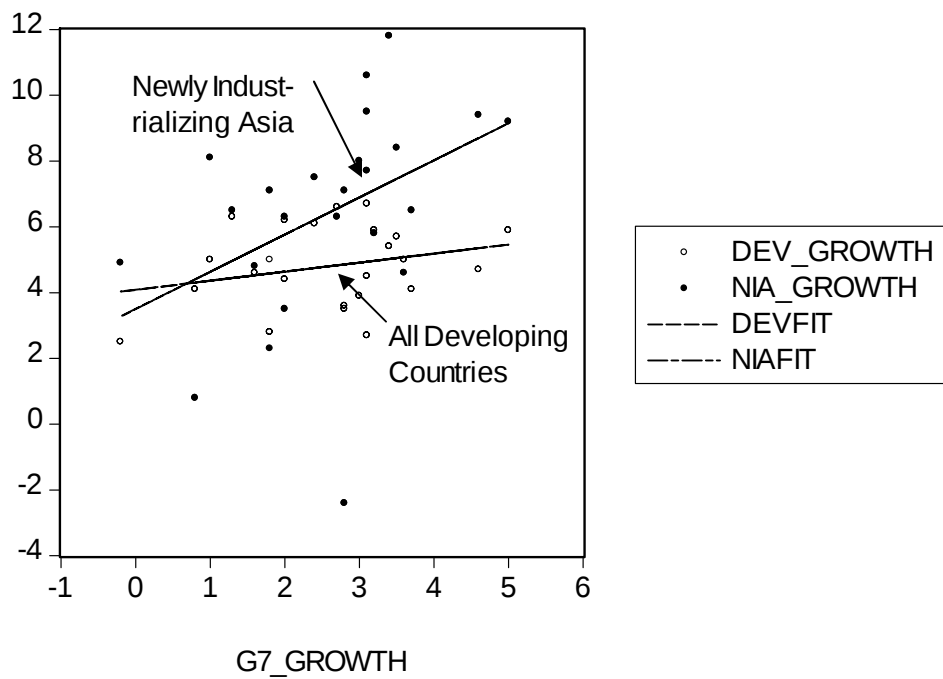


Figure 2: Growth Rates: Developing and Newly Industrializing Asia against Advanced Countries

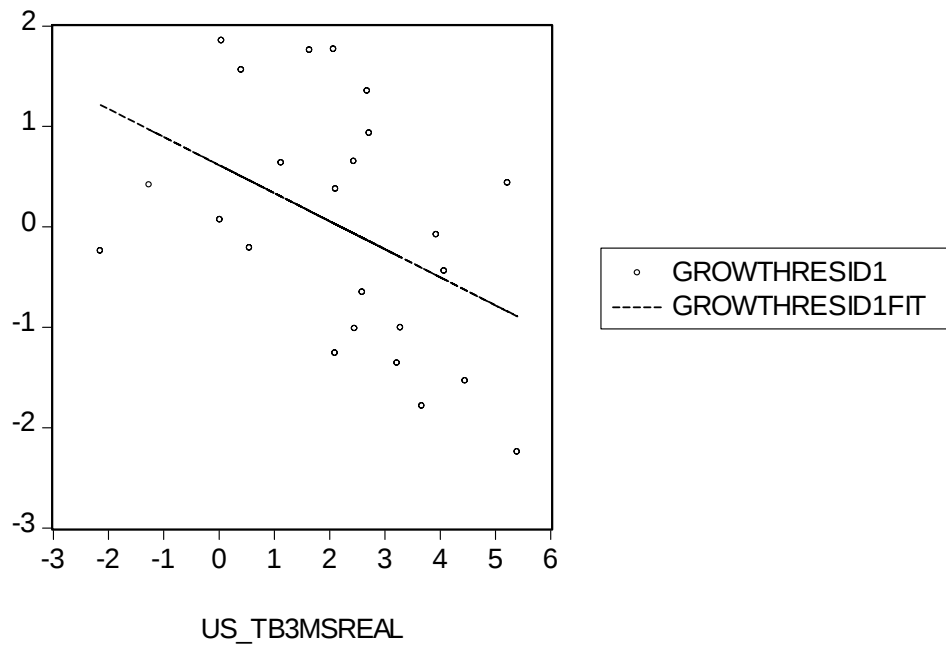


Figure 3: Developing Countries Growth Residual on US Real Interest Rate



Figure 4: Change in Terms of Trade against Advanced Country Growth Rate

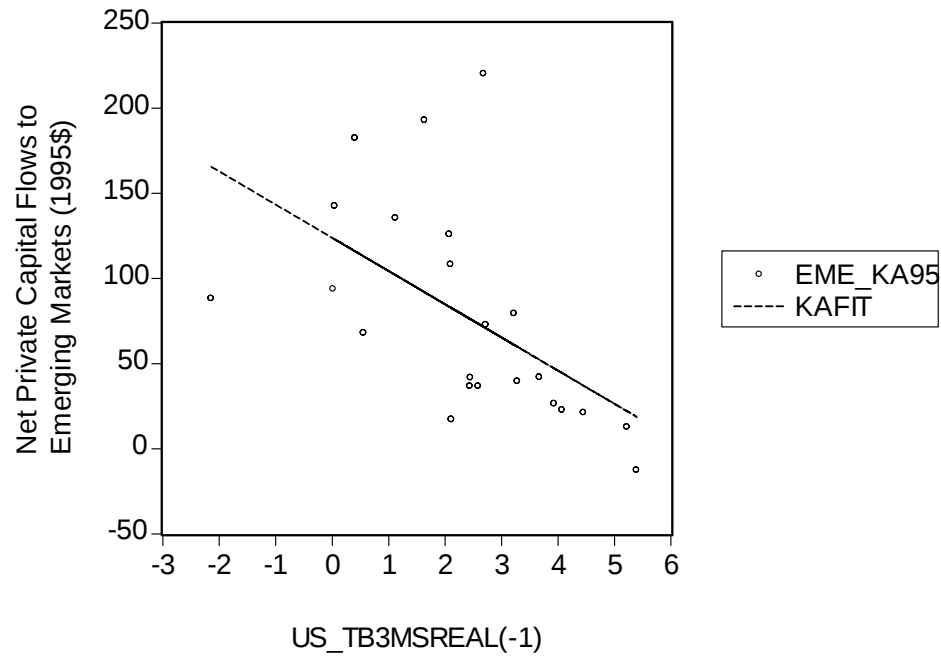


Figure 5: Net Private Capital Flows (1995\$) to Emerging Markets against US Real Interest Rate

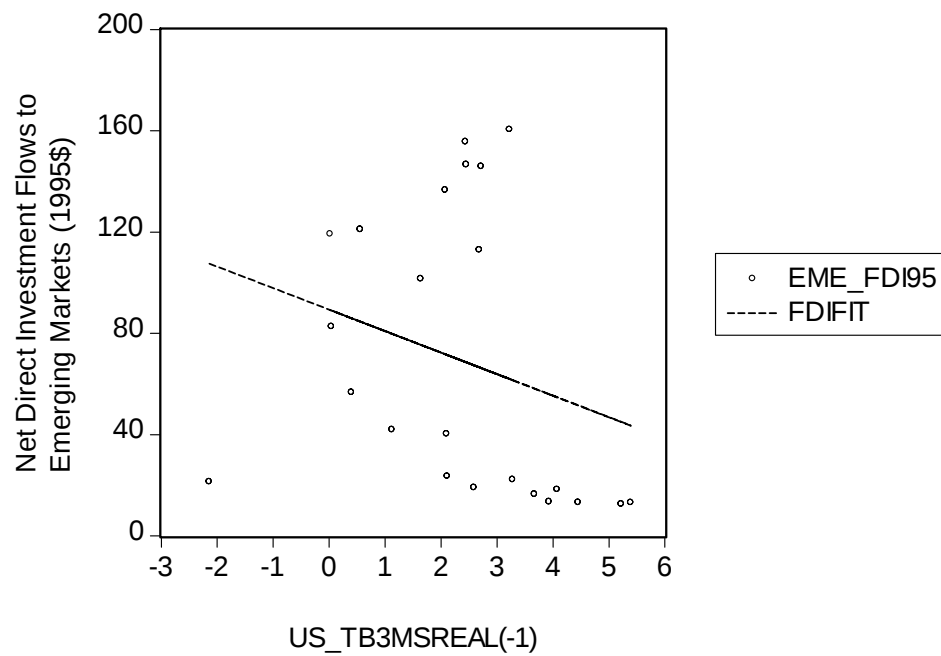


Figure 6: Net Direct Investment Flows (1995\$) to Emerging Markets against US Real Interest Rate

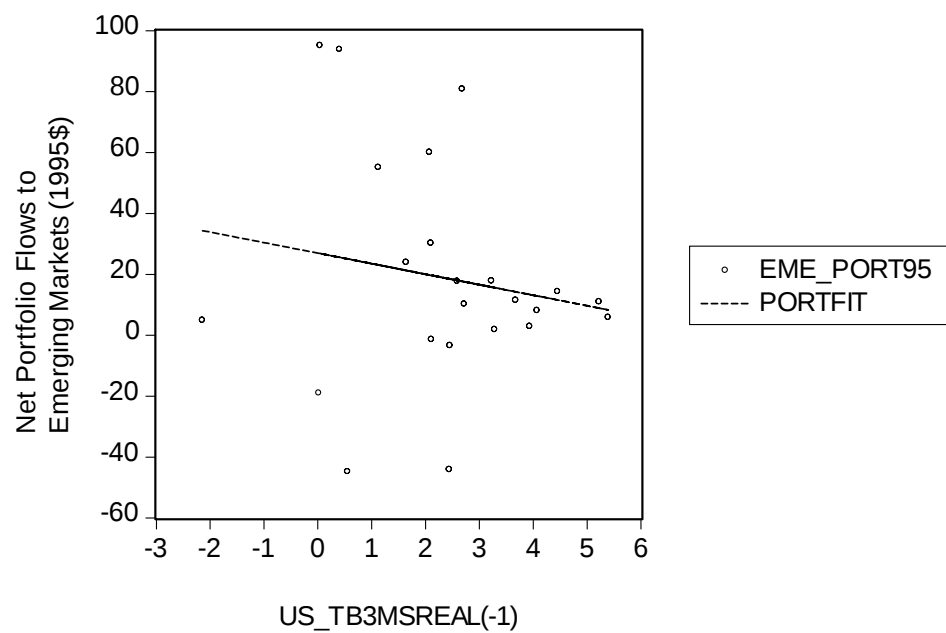


Figure 7: Net Portfolio Flows (1995\$) to Emerging Markets against US Real Interest Rate

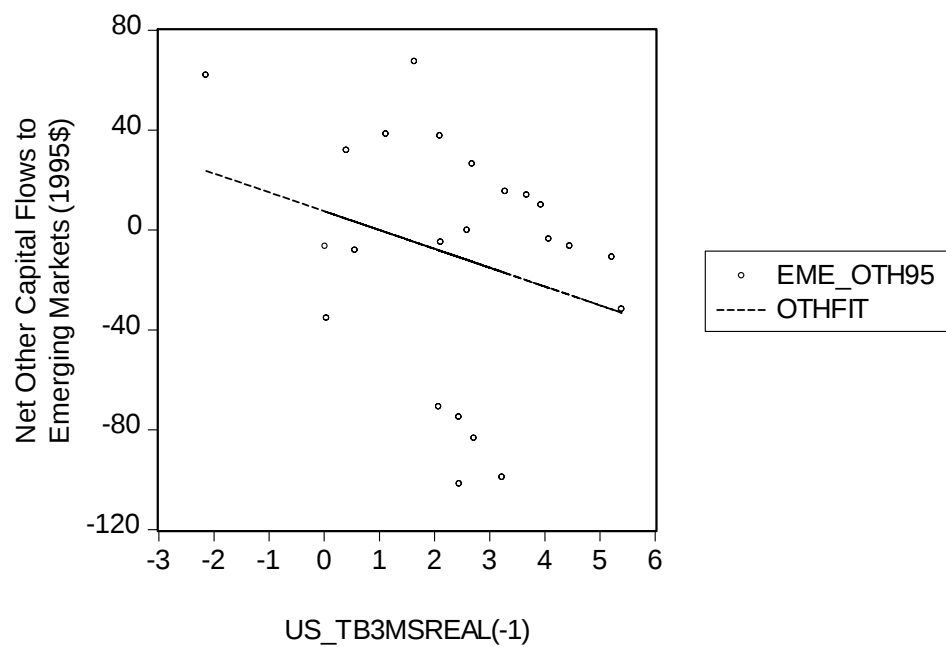


Figure 8: Net Other Private Flows (1995\$) to Emerging Markets against US Real Interest Rate

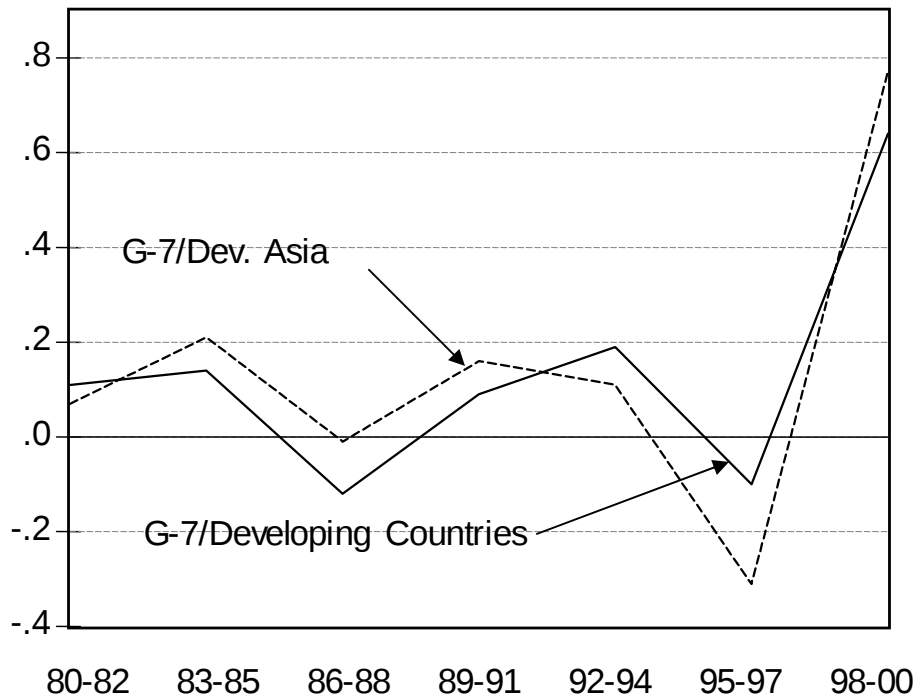


Figure 9: Average Business Cycle Correlations, G-7 Countries with Selected Groups

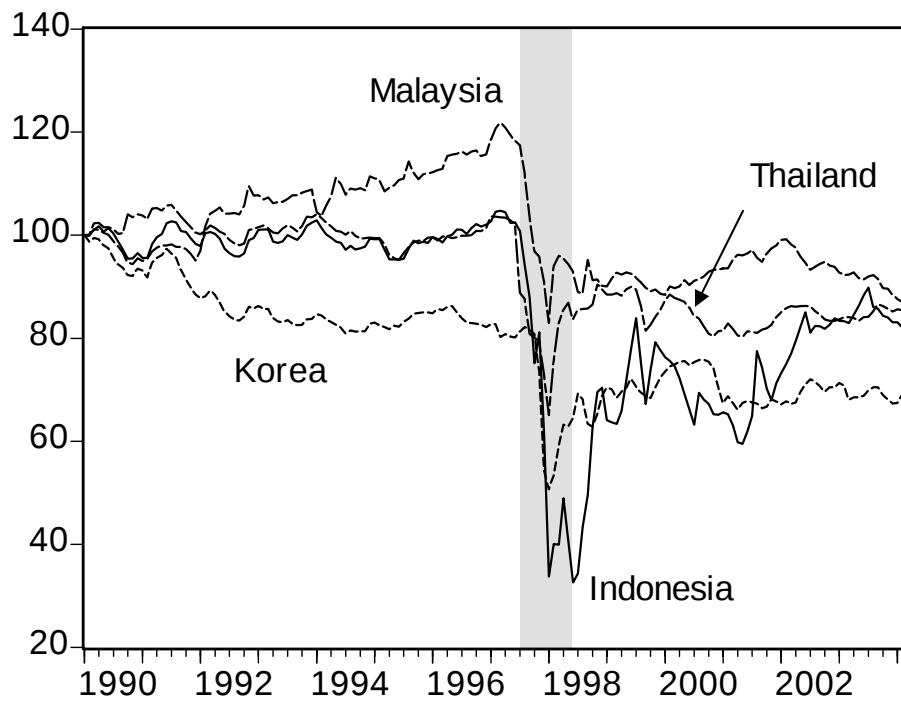


Figure 10: Trade Weighted Real Currency Values for Crisis Countries: Source: JP Morgan.

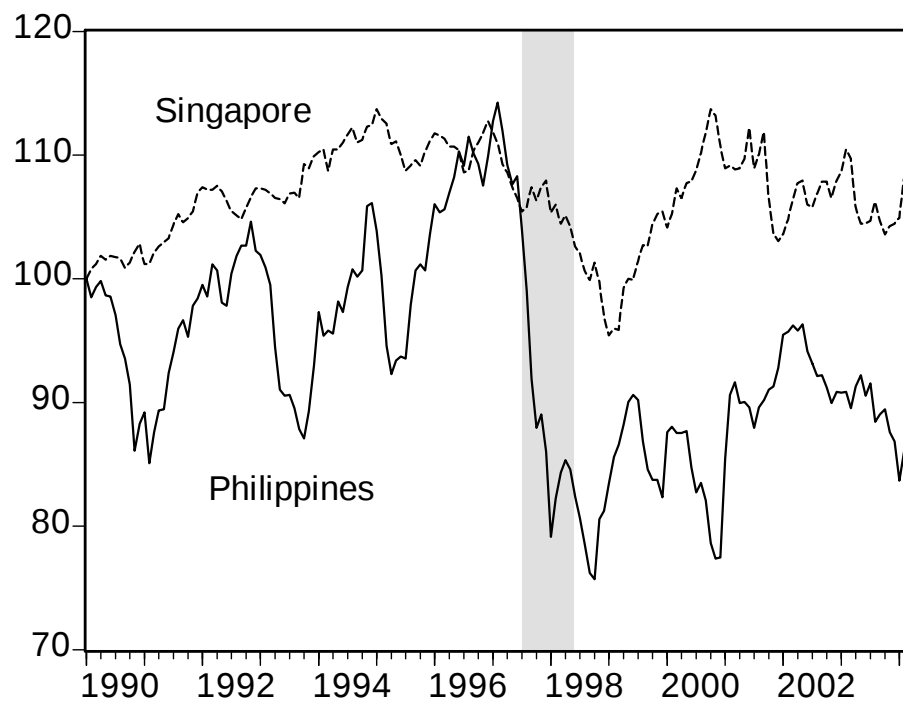


Figure 11: Trade Weighted Real Currency Values for Philippines and Singapore. Source: JP Morgan.

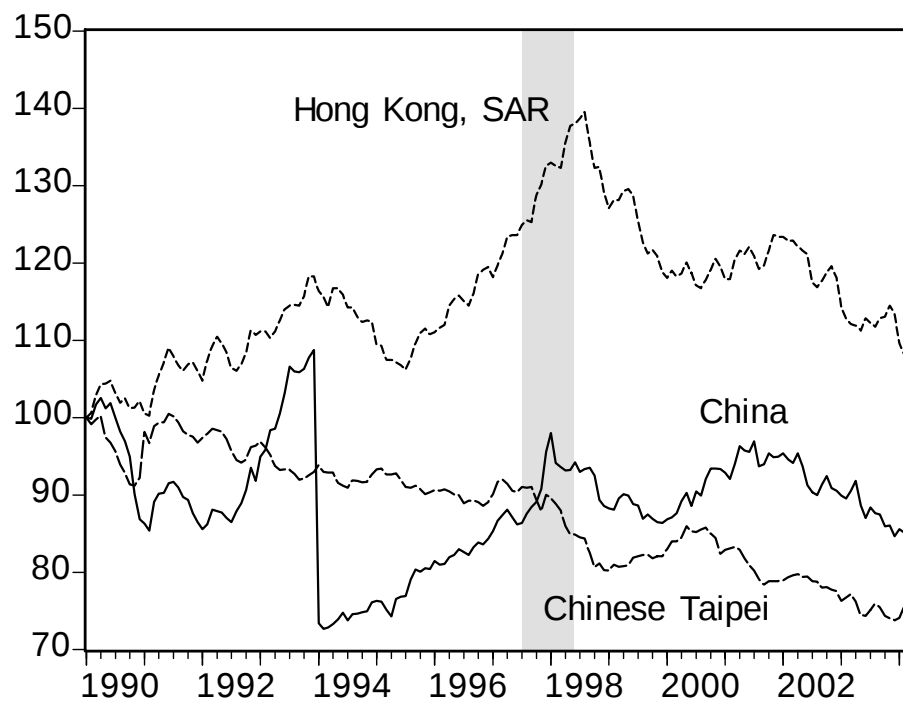


Figure 12: Trade Weighted Real Currency Values for PRC, Hong Kong and Chinese Taipei. Source: JP Morgan.