Dynamics of Business Cycles in Asia: Differences and Similarities

Sunghyun Henry Kim

M. Ayhan Kose

Michael G. Plummer

Graduate School of International Economics and Finance, Brandeis University

Working Paper Series Vol. 2000-15
August 2000

The International Centre for the Study of East Asian Development, Kitakyushu

Dynamics of Business Cycles in Asia: Differences and Similarities

Sunghyun Henry Kim*
M. Ayhan Kose*
Michael G. Plummer*

March 2000

Abstract: The objective of this paper is to document the key features of business cycles in the Asian economies. We determine the extent of the similarities and differences across the business cycle characteristics of these countries and compare the cyclical regularities in this region with those of the G7 countries. We find that while the patterns of business cycle fluctuations in the main macroeconomic aggregates display important similarities, the behavior of fiscal and monetary policy variables exhibits significant differences across the Asian countries. These economies are generally more volatile than the G7 countries, but the amplitude of economic fluctuations in the Asian countries tends to decrease over time. Comovement and persistence properties of business cycles in the Asian countries are very similar to those of the G7 economies. The cross-country correlations of the cyclical fluctuations in aggregate output and its components in the Asian countries are in most cases positive and seem to be increasing over time. To examine the extent of comovement in the region, we also study different measures of region specific business cycles. We find that there is a high degree of comovement between the business cycles of the individual countries and our measures of Asian business cycles. These results provide important insight into the short-run macroeconomic dynamics, as well as to the region's long-run economic policy objectives. First, the contagious nature of economic fluctuations can be explained at least in part by simple transmission mechanisms of business cycles. Second, the process of long-term economic integration should not be viewed as a major problem as far as the features of macroeconomic fluctuations are concerned, since the types of shocks and their propagation dynamics across these countries are quite similar.

* Graduate School of International Economics and Finance, Brandeis University, Waltham MA, 02454. e-mail (Kim): hkim@brandeis.edu, e-mail (Kose): akose@brandeis.edu, e-mail (Plummer): plummer@brandeis.edu, phone (Kim): (781) 736-2268, phone (Kose): (781) 736-2266, phone (Plummer): (781) 860-7415. We gratefully acknowledge financial support from The International Center for the Study of East Asian Development (ICSEAD). Earlier versions of this paper were presented at the 1999 ACAES International Conference on Asian Economics in Seoul, The International Center for the Study of East Asian Development (ICSEAD) in Kitakyushu, Japan, and the 2000 Eastern Economic Association Conference in Virginia. We would like to thank Shinichi Ichimura, William E. James, Eric Ramstetter, and seminar participants for their comments. We are thankful to Kulaya Tantitemit for superb research assistance. The usual disclaimer applies.

1. Introduction

In recent years, a rapidly growing research program in the international business cycle literature has focused on documenting stylized features of domestic and international business cycles and developing dynamic stochastic general equilibrium (DSGE) models to explain them.[1] To date, studies in this research program have primarily focused on business cycle features of major developed economies and a limited number of developing countries. However, only a few studies have examined the stylized features of business cycles of Asian countries whose remarkable growth performance over the last three decades has been the subject of intensive research.[2]

The objective of this paper is to fill this gap by documenting the empirical regularities of business cycles in the Asian countries. In particular, we are interested in answering the following questions: first, what are the main characteristics of macroeconomic fluctuations in the Asian countries? Second, what are the differences and similarities between the features of business cycles in these countries and those in the major industrialized economies? Third, do we observe a distinct Asian business cycle? Fourth, have the characteristics of business cycles change as these economies mature over the years? Fifth, can our findings shed light on the contagious nature of the recent economic crisis in Asia? Our study also provides a set of benchmark statistics for evaluating the performance of business cycle models designed to examine the sources of business cycles in the Asian countries.

The results of our research provide important insight into recent developments as well as to the long run economic policy objectives of the region. First, considering the recent economic crisis, the rapidity and magnitude of contagion effects beg for answers as to the propagation of different types of shocks from one country to another, and to determine the extent of the co-movement properties of economic activity in the region.[3] Second, the Asian countries in our sample are members of APEC, which has the fundamental objective of establishing "free and open trade and investment in the region" by 2010 for developed countries and 2020 for developing countries ("Bogor Vision"). Since the most efficacious design of the policies in APEC largely depends

[1] See Baxter (1995) for a survey on the DSGE models of open economies.
[2] For recent surveys of the literature focusing on the growth performance of the Asian economies, see Fu, Huang, and Lovell (1999) and Crafts (1999).
[3] See Roubini's homepage www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.html for a variety of recent studies about the recent economic crisis in Asia.

on the similarities and differences of macroeconomic activity across these economies, understanding these similarities and differences becomes much more important in evaluating the feasibility of economic cooperation initiatives between member-countries.

The empirical literature on business cycles has rapidly expanded during the last decade:[4] Backus, Kehoe, and Kydland (1995) examine the characteristics of business cycles in the major industrialized countries. Christodulakis, Dimelis, and Kollintzas (1995) study the features of business cycles in the EC economies. Mendoza (1995) compares business cycle characteristics of a group of developed economies with those of some developing countries. Kose (1999a, 1999b) investigates the cyclical regularities observed in several small open developing countries.

Our study extends the previous research along several dimensions: first, we consider a large group of Asian countries and examine their macroeconomic fluctuations for a relatively long horizon. In particular, we study the cyclical features of seven Asian countries—Indonesia, Korea, Malaysia, The Philippines, Singapore, Taiwan, and Thailand—for the 1960-1996 period. We also compare the stylized features of business cycles in these countries with those in the G7 economies. Second, considering that most countries in our sample have experienced a structural transformation with very high growth rates, we study two different sub-periods, 1960-1984 and 1984-1996, to understand whether there is any change in the characteristics of business cycles of these countries over time. Third, we analyze the linkages among the Asian economies and explore the existence of an Asia-specific business cycle. Fourth, we apply different types of filtering methods to extract the trend component from time series and examine whether different filtering methods have any effects on

[4] Bergman, Bordo, and Jonung (1998) consider the evolution of business cycle characteristics and their link with different monetary regimes in developed economies. Agenor, McDermott, and Prasad (1998) document the main features of business cycles in twelve developing countries using quarterly data. Kose and Riezman (1999) study the cyclical features of macroeconomic fluctuations in several African countries in the context of a small open economy DSGE model. There are also some recent studies focusing on the Asian countries: Damle (1997) examines the stylized facts of the business cycles in seven Asian countries—China, India, Indonesia, the Philippines, Korea, Taiwan, and Thailand. Ahmed and Loungani (1997) and Hoffmaister and Roldos (1996) examine the sources of macroeconomic fluctuations in Asian economies using VAR models. Mori (1991) studies the business cycles in selected Asian countries using coincident indicators of cyclical fluctuations. Baxter (1995), Backus, Kehoe, Kydland (1995), and Crucini (1999) provide surveys of the international business cycle research program.

the empirical results. This also allows us to investigate the nature of business cycle fluctuations at different cyclical frequencies.

The rest of the paper is organized as follows: first, we provide a brief summary of our econometric methodology in section 2. Next, we study the compositions of national expenditure, aggregate output, exports, and imports, as well as document how the compositions vary over time, to gauge the structural change in economic activity in these countries in section 3. Since our objective is to document the properties of macroeconomic data without imposing strong theoretical priors, we follow the tradition of the modern business cycle research program and concentrate on simple features of business cycle fluctuations. In section 4, we explore the regularities of business cycles, followed by an examination of the comovement properties of aggregate output in section 5. We also study the cross-country correlations of some of the components of output to determine whether there is an increasing degree of synchronization of business cycles in the Asian countries. We conclude with a summary of our results in section 6.

2. Econometric Methodology and Data

We follow the common practice in the international business cycle literature and decompose the time series into secular and cyclical components.[5] The secular (trend) component captures the long-term trends in the data, i.e. non-stationary low-frequency dynamics. The cyclical one measures the deviations from the long-term trends, i.e. stationary high-frequency fluctuations.

Several methods are available for implementing this type of trend-cycle decomposition.[6] Since we plan to compare our results with those in earlier studies, we employ a method that has been widely used in the literature. The method, which was first proposed by Hodrick and Prescott (HP) (1997), decomposes a given time series into a trend component and a cyclical component by solving an optimization problem. The objective of the optimization problem is to estimate a smooth trend line,

[5] A given time series can be written as the sum of a trend component, a cyclical component, a seasonal component, and a noise component. Since our study uses only annual data, we do not consider the seasonal component.

[6] There has been an intensive debate about the sensitivity of stylized business cycle features to different types of decomposition methods. See Canova (1998) for an extensive discussion of this issue. We employ three filtering methods to check the sensitivity of our results to the decomposition method.

which might be drawn by freehand, from the data.[7] There is a trade off between the smoothness of the trend component and its ability to follow a series well in this problem.

A brief description of this method is as follows: consider a given time series $\{y_t\}_{t=1}^{T}$, expressed in natural logarithms.[8] We can split the series y_t into a cyclical component, x_t, and a trend component, g_t, where

$$y_t = x_t + g_t$$

The trend component can be found by solving the following optimization problem:

$$\min_{\{g_t\}_{t=1}^{T}} \sum_{t=1}^{T} x_t^2 + \lambda \sum_{t=2}^{T-1} [(g_{t+1} - g_t) - (g_t - g_{t-1})]^2$$

The first term in this optimization problem is the sum of squared deviations from the trend component and measures the fit of the trend to the time series. The second term is the sum of squares of the trend component's second differences and measures the smoothness of the trend. The parameter λ is a smoothing parameter, which penalizes the acceleration in the trend component. This optimization problem can easily be solved using standard numerical routines.[9] We set the value of λ at 100, which is the conventional value used for annual data in the literature. Figure 1 depicts the data, HP trends, and cyclical components for output of Japan and Korea.

We also employ the first difference (FD) filter, which is another popular method in the literature, to examine the sensitivity of our results to the detrending method and to study the growth rates of macroeconomic variables.[10] This filtering method assumes that the trend is a random walk without drift and the trend and cyclical components are independent. The cyclical component with this filter is given as

$$x_t = y_t - y_{t-1}$$

[7] Kydland and Prescott (1997) note that "the trend component of real GNP should be approximately the curve that students of business cycles and growth should draw through a time plot of this time series."

[8] We express all variables, except net exports, in natural logarithms because we focus on the percentage (instead of absolute) deviations from trend considering the following approximation: $d\log x_t = \log x_t - \log x \cong (x_t - x)/x$, where x is trend or previous period's value.

[9] The program used to solve this optimization problem is available from the authors upon request.

One should be cautious of interpreting our sensitivity results because each decomposition method leaves stationary cycles that have different average length in the data. The FD filter leaves in the data cycles with a periodicity less than three years and the HP filter passes cycles with a periodicity between four to six years in the data. Figure 1 also presents the cyclical components of output series for Japan and Korea generated by the FD filter.[11]

Our definition of a business cycle follows the conventional definition in the literature. In particular, we consider business cycles as "movements around trend in output" and study business cycle regularities defined as "comovements of the deviations from trend in different aggregate time series".[12] We study the following features of the time series: volatility as measured by the percentage standard deviation, persistence as measured by the first-order autocorrelation coefficient, and the degree of contemporaneous and non-contemporaneous correlations of a series with output, as measured by the coefficients up to a first lag and lead. Volatility measures the amplitude of fluctuations; persistence indicates the amount of inertia in business cycles; and comovement provides information on whether a series behaves pro-cyclically or counter-cyclically.

A positive (negative) correlation between output and a macroeconomic variable indicates that the variable is procyclical (countercyclical). If the correlation is close to zero, then the variable is largely uncorrelated with the cycle or acyclical. With regards to non-contemporaneous comovements with output, our interpretations are as follows: let's denote detrended output by z_t. The cross correlation between z_t and x_{t-i} is denoted as $\rho(t-i)$ with i = -1 or 1. If the correlation between z_t and x_{t-1} (x_{t+1}) is relatively large in absolute terms, then it indicates that the cycle in time series x leads (lag) the cycle of z. We consider that the correlation is significant if it exceeds the confidence bands given by $\pm 1.96/\sqrt{T}$ where T is the number of observations, depending on the leads/lags taken for the autocovariances.[13] The cut-off

[10] We also employ the band-pass (BP) filter of Baxter and King (1999). Appendix II provides a brief summary of this filtering method and the results obtained by the BP filter.

[11] The HP filter eliminates low frequency movements while leaving high frequency cycles the same. The FD filter amplifies the high frequency fluctuations while dampening low frequency movements. It is not easy to capture this fact in annual data. There are several papers studying the features of different types of filters and emphasizing these types of differences. See Canova (1998) for a survey.

[12] These definitions were first proposed by Lucas (1977).

[13] This number roughly corresponds to the required value to reject the null hypothesis of no correlation at the 5% significance level of two-sided t-statistic.

point, determining a significant correlation, is approximately ± 0.32 in our full sample (1960-1996).[14]

Our data sample covers the period of 1960-1996.[15] Several factors suggest that the features of business cycle fluctuations in the Asian economies may have changed over this period: first, these economies have exhibited substantial growth in this interval. Second, sectoral compositions of aggregate output, exports, and imports have significantly changed over this time interval. Therefore, we study two sub-periods, 1960-1984 and 1985-1996, and compare our findings associated with the full sample (1960-1996) with the results of these two sub-periods. We provide extensive evidence indicating that structural characteristics of the Asian economies change significantly over these two periods in the next section. In particular, as the share of industrial activity increases in aggregate output, export base of these economies significantly expands in the 1985-1996 period.

Another important reason why we choose the mid-1980s as the break point is that it roughly corresponds to a "structural policy break" in East Asia. In part due to economic slowdown, adverse changes in terms of trade, and shifts in the relative influence of "technocrats" (as opposed to "nationalists"), the resource-rich ASEAN countries began a fairly radical shift in their respective economic development strategies, from more inward-looking policies to outward-orientation. As part of this process, tariffs and non-tariff barriers began to be reduced (and made more transparent), and policies relative to direct foreign investment (DFI) inflows were liberalized (and, to some extent, harmonized in ASEAN). Moreover, a more flexible approach to exchange-rate management was embraced in order to maintain competitiveness; for example, Thailand devalued its currency in 1984 and Indonesia undertook three major devaluations in the 1980s, beginning in 1983.

While economic reform at various levels had begun earlier in South Korea, by the mid-1980s it still had a fairly protectionist structure in place and, in effect, DFI flows —both inward and outward— were highly regulated until 1984-85, after which there was a rapid increase in especially outward DFI flows. Coupled with the steep yen appreciation that began in early 1985, these Asian countries experienced a rapid increase in export growth and DFI; inward portfolio investment flows also began to

[14] For the first period (1960-1984), the cut-off point is 0.39; for the second period (1985-1996), the cut-off point is 0.57.

increase during this time, but didn't really take off until the financial liberalization of most Asian countries in the early-mid 1990s. One exception is the Philippines, which experienced relatively low growth. However, this can be explained by political transition from the Marcos regime, and subsequently a fairly cautious liberalization stance. While Singapore and Hong Kong remained among the most open economies in the world over the entire sample, Singapore in particular faced low growth in the mid-1980s to some degree due to contractionary fiscal policy.[16]

Hence, although no break point is without its problems, the mid-1980s appears to be an interesting marker as a major structural break point, both from the viewpoints of changes in macroeconomic performance and policy stance.[17]

The following seven Asian countries are included in our sample: Indonesia, Korea, Malaysia, The Philippines, Singapore, Taiwan, and Thailand. We also study the business cycle features of the G7 economies for comparison purposes. Most data series, unless otherwise stated, are taken from the IFS. For some of the individual series, we use the Penn World Table (PWT). The data describing composition of output, exports, and imports are drawn from the Handbook of International Trade and Development Statistics. We provide the details on the definitions of the variables and the data sources in Appendix I.

3. Structural Characteristics

We first briefly examine the national expenditure components and the sectoral composition of aggregate output of the Asian countries in this section. Then, we study sectoral composition of external balances. We also analyze the data of the G7 countries for comparison purposes. Understanding the differences in structural characteristics across countries and changes in these characteristics over time is important, as they can help explain cross-country differences in the stylized features of business cycles and potential importance of various shocks affecting these economies.

[15] Our data set ends in 1996 since we would like to understand the nature of cyclical fluctuations in the pre-crisis period.

[16] For example, the increase in Central Providence Fund taxes in order to speed up structural change in the city-state in 1984-85, a policy that was reversed subsequently.

3.1. Composition of Aggregate Output

We present the expenditure shares in Table 1a. For the whole sample period, consumption and investment on average constitute respectively 64% and 25% of aggregate output, ranging from 56% to 71% and 20% to 32% for each series. On average, government expenditures account for 12% of total output with a range from 9% in the Philippines to 17% in Taiwan. Shares of exports and imports are relatively large and significantly different across economies: exports and imports are on average 45% and 49% of aggregate output, respectively. Exports (imports) range from a low of 21% (20%) in Indonesia to a high of 122% (151%) in Singapore.

We also calculate the ratio of exports plus imports to output, which is a widely used measure of openness. According to this measure, the Asian countries in our sample appear to be quite open: on average the openness ratio is around 94% for the entire group. The least open economy in the region is Indonesia with an average openness ratio of 41% and the most open economy is Singapore with an average openness ratio of 273%. High degree of openness can potentially make these countries more prone to foreign shocks, such as sudden changes in the world prices of their main export and import items. The Asian economies in our sample have registered average trade deficits of around 2% for the whole sample period. These findings suggest that while shares of consumption, investment, and government expenditures in total output are quite similar, export and import shares seem to exhibit more variation across these economies.

Average shares of consumption and investment are slightly smaller in the G7 countries than in the Asian group. The G7 economies have on average larger shares of government expenditures in total output than the Asian countries, as the average share is around 17% in the former group. While all government expenditure figures are within one standard deviation of the mean in the sample, Japan's share of government expenditures is much smaller than the G7 average. Another notable difference between the two groups is the share of international trade: in the G7 countries, exports and imports on average account for around 18% of total output. Shares of external trade in the G7 countries are almost three times smaller than those in the Asian countries implying the Asian economies are roughly three times more open than the G7 countries.

[17] We also examined whether our results significantly change if we use 1983 or 1985 as a break point.

We now turn to differences across the two sub-periods: first, shares of investment, exports, and imports significantly increase in the second period in all of the Asian countries. This trend is an important characteristic of the so-called "Asian Development Model."[18] In particular, average shares of exports and imports rise by 41% and 25%, respectively, and the average investment share increases by 35% in the second period. In the G7 countries, the average investment share decreases in the second period. While shares of exports and imports also rise in the G7 countries, they have recorded much smaller increases compared to the Asian countries. Second, the government expenditure share is stable across the two sub-periods in the Asian group. In all of the G7 countries except the U.S., the share of output allocated to government expenditures rises in the second period.

Table 1b presents information on the sectoral composition of aggregate output. For the entire sample period, industry and service sectors account for roughly 34% and 47% of aggregate output, respectively, in the Asian countries. Contribution of the industry (service) sector to economic activity ranges from a low of 30% (37%) in Thailand (Indonesia) to a high of 42% (64%) in Taiwan (Singapore). On average in these economies, agricultural output constitutes approximately 20% of total output. However, the role of the agriculture sector varies considerably across the Asian countries: while it accounts for 31% of total output in Indonesia, less than 3% of output is due to the agriculture sector in Singapore. The share of the agriculture sector is almost five times smaller in the G7 countries than the Asian countries. On average, industry and service sectors are much larger in the G7 countries as they make up almost 40% and 56% of total output, respectively.

Typically, in the process of economic development, the role played by the industry and service sectors becomes more important: in all of the Asian countries except Singapore —which arguably already a developed economy— shares of these two sectors increase in the second period, while the share of agricultural activity decreases. In particular, the average share of agriculture sector goes down from 24% to 13% and the share of the industry (service) sector increases from 31% (45%) to 39% (48%). This trend is partly similar to the one observed in the G7 countries: the service sector becomes more important and the share of agricultural products

---

The results are not significantly different from 1984, suggesting our findings are robust.

[18] Ito and Krueger (1995) and World Bank (1993) provide detailed examinations of the Asian Development Model.

decreases in the second period. However, unlike the Asian countries, the G7 economies seem to have smaller shares of industrial sector shares in the second period than in the first period. To be more specific, while the share of industry sector increases in all of the Asian countries, it decreases in all G7 countries.

3.2. Composition of International Trade

We study decomposition of exports in Table 1c. Manufactured goods on average account for more than 45% of export revenues in the Asian countries for the entire period. While Korea and Taiwan heavily rely on exports of manufactures, less than one-fourth of export revenues is due to the manufactured goods in Indonesia and the Philippines. In Singapore, Malaysia, and Indonesia, a significant fraction of export revenues comes from exporting fuels to the rest of the world.[19] Primary goods production on average accounts for roughly 39% of the total exports in the Asian countries. In the G7 countries, while the average share of manufactured goods exceeds 75% of total exports, the share of fuel exports is less than 5% for the whole period. The role played by the manufacturing sector in Asia becomes much more important in the second period; its share of total exports increases from 33% to 62%. The increase in the share of manufactured goods and the decrease in the share of primary goods in total exports are common features observed in all Asian countries in our sample. Interestingly, the G7 countries appear to have the same feature. However, the change in the share of manufactures is much smaller in the G7 economies: while the share of manufactures in total exports on average increases by almost 100% in the second period in the Asian countries, it rises by less than 10% in the case of the G7.

To further examine the composition of exports, we study three widely used measures in Table 1d, namely, the number of exported commodities, the export diversification index, and the export concentration index.[20] By all these three measures, the exports of the Asian countries seem to be quite diversified. Interestingly, all three measures suggest that the degree of export diversification significantly increases in the second period in these countries. For example, the average number of exported commodities increases from 112 to 190, and the export diversification (concentration) index decreases from 0.74 (0.30) to 0.58 (0.20). The

[19] Singapore is a key center for refining Indonesian and Malaysia petroleum and, hence, export--and import--data imply that fuels play an exaggerated role in the Singapore economy.
[20] We provide detailed information about these measures in Appendix I.

G7 countries have a more diversified export base than the Asian countries and the variety of exported products in the G7 countries also gets wider in the second period.

Table 1e presents the composition of imports. Manufactured goods account for the bulk of imports in the Asian countries, constituting roughly 63% of total imports. Primary goods and fuels make up 20% and 15% of total imports, respectively. The import structure of the Asian countries is very similar to that of the G7 countries: in the latter group, manufactured imports account for 56% and primary goods and fuels constitute 27% and 17% of imports, respectively. While the share of manufactures in the total imports increases, shares of primary goods and fuels go down in the second period in both groups.

We conclude this section with a brief summary of our main findings: first, while expenditure shares of consumption and investment in the Asian countries are quite close to those in the G7 countries, the share of the government expenditure is much smaller in the former group. Second, as the Asian economies mature, shares of investment, exports, and imports in total output significantly increase. Third, the Asian economies are much more open than the G7 countries, and the degree of openness increases in these countries over time. Fourth, shares of industrial production and the service sector simultaneously get larger and the role of agricultural sector in the economy significantly diminishes as the Asian countries become more developed over time. Fifth, as the Asian economies become more open, they appear to establish a more diversified export base. Finally, compositions of imports of the Asian and G7 countries are quite similar. These results also suggest that the Asian countries in our sample constitute a homogenous group in several aspects.

4. Stylized Features of Asian Business Cycles

This section presents our findings regarding the business cycle features of the Asian countries and compares them with those of the G7 countries. We first examine the volatility and persistence of growth dynamics in these countries. Then, we turn our attention to the amplitude and comovement of fluctuations in aggregate output and its components. We also study the cyclical features of components of external accounts. Next, we examine the fluctuations in price levels and monetary aggregates. Finally, we analyze whether these stylized features can be accounted for by standard DSGE models.

4.1. Output Growth Rates

Table 2 reports means, standard deviations, and autocorrelation coefficients of output growth rates, which are generated by the FD filter, for the Asian and G7 economies. For the whole period, the average growth rate of the Asian economies is more than two times larger than that of the G7 group. While the average growth rate in the Asian countries ranges from a low of 4% in the Philippines to a high of more than 8% in Singapore, the same statistic in the G7 group is between 2.3% in the U.K. and 5% in Japan. On average, the Asian countries' growth rates are more volatile than those of the G7 countries. With respect to persistence, the Asian economies display more variation than the G7 countries but the average autocorrelation of the output growth rate is almost the same in the two groups.

Four out of seven Asian countries in our sample have experienced faster growth in the second period. However, the increase in the average growth rate is small in this period. Unlike the Asian countries, the G7 economies display slower growth in the second period. On average, the growth rate of the Asian economies is almost three times higher than that of the G7 countries in the second period.

The standard deviation of growth rates is lower in the second period in all Asian economies except Thailand. The average standard deviation of growth rates decreases by more than 30% in the second period, suggesting that overall macroeconomic volatility in the Asian countries decreasing over time. This is an interesting observation because the Asian countries register significant increases in the shares of investment, exports, and imports, which are the most volatile components of aggregate output. The average standard deviation of output growth rate in the G7 group also falls in the second period.

The autocorrelation of output growth rate also changes over time: the growth rates become more persistent in the second period in all Asian countries except Singapore and Taiwan. However, there is a great deal of variation in the persistence of output growth rates across countries. Growth rates of the G7 countries also become more persistent in the second period.

4.2. Properties of Output Fluctuations

Table 3 presents the magnitude and persistence of output fluctuations, measured by the HP filtered data. The Asian economies are roughly 35% more

volatile than the G7 countries for the entire sample period.[21] Compared with other results in the literature, our findings suggest that the Asian economies appear to be less volatile than most of the developing countries. Mendoza (1995), Kose (1999a), and Kose and Riezman (1999) find that the volatility of aggregate output is two to four times larger in the developing countries than that of the developed economies. Several factors can account for the highly volatile economic environment in developing countries, such as institutional problems, political transition, difficulties associated with the development process, and absence of well established financial markets. Some external factors—highly volatile world prices, world interest rate shocks, and cyclical dynamics in developed countries—also affect the export and import demand in developing economies. This in turn can produce a more volatile economic environment in developing countries.

A growing research program has focused on understanding why small open developing economies are more volatile than the developed ones. For example, Crucini (1997) provides a two-country model in which the size difference causes larger macroeconomic volatility in a small country than a large one. Head (1995) constructs a multi-country model where foreign shocks have a greater impact on small countries than on large countries, inducing higher volatility in small countries. Kose (1999b) provides a small open economy model, designed for a typical developing economy, in which a significant fraction of highly volatile domestic economic fluctuations is explained by changes in the world prices of exports and imports. There has also been a growing research program studying the link between high volatility and growth. For example, Ramey and Ramey (1995), using the data of developing and developed economies, find that countries with highly volatile macroeconomic environments exhibit relatively lower growth rates.

In all Asian countries except Thailand, the volatility of output decreases in the second period. In other words, the amplitude of macroeconomic fluctuations in these economies becomes smaller in the latter period. In the first period, Singapore is the most volatile economy with an output volatility of 4.4%, and Thailand is the least volatile economy with an output volatility of 2%. In the second period, the Indonesian economy becomes the least volatile one with an output volatility of less

[21] However, unlike the results generated by the FD filter, the results from the HP filtered data indicate that the difference in the volatility of output fluctuations of the two groups is smaller. This suggests

than 1%, and the Philippines has the most volatile output with an output volatility of 2.6%. Almost all countries exhibit volatility figures that are within the area of one standard deviation around the mean.

How can we explain the decrease in the amplitude of economic fluctuations in the Asian countries in the second period? First, as we noted in the previous section, the share of agricultural activity decreases and shares of industry and service sectors increase over time. The agricultural sector output is highly variable since it is heavily affected by extremely volatile productivity and price shocks. As the relative size of agricultural production decreases in these countries, output volatility diminishes over time, ceteris paribus. This result implies that the decrease in output volatility due to the decrease in the share of the agricultural sector in total output outweighs the potential increase in the volatility of output due to the increases in the shares of highly volatile expenditure components, such as investment, exports, and imports in the second period. In other words, the change in the industrial composition plays a more dominant role, resulting in a decrease in the volatility of aggregate output over time in these economies.

Second, as we discuss in the next section, the measures of fiscal and monetary policy variables, such as government expenditure and money stock, appear to be less volatile in the second period, suggesting a higher degree of stabilization in economic policy formation. Third, as financial markets develop in the Asian countries, the set of financial instruments, which are used for hedging against different types of shocks and provide a variety of risk-sharing opportunities, is expanded. This, in turn, also reduces the volatility of economic activity in these economies. Fourth, global economic shocks, such as the global expansion in the 1960s, breakdown in the international financial order, oil price shocks in the 1970s, and the debt crisis in the early 1980s, were much stronger in the first period.

Unlike the Asian economies, the G7 countries do not display any significant decrease in the volatility of their aggregate output over time. While the volatility of output increases in four G7 countries, it diminishes in the other three G7 countries in the second period. Interestingly, the average output volatility is larger in the Asian countries than the G7 group in the first period, but in the second period the Asian economies as a group become slightly less volatile than the G7 countries.

---

that as the duration of business cycles becomes longer, the difference in the volatility of output growth

In terms of persistence of output fluctuations generated by the HP filter, our findings reveal that the autocorrelation of output is fairly high in all Asian countries during the 1960-1996 period. The two groups do not exhibit any major differences in the autocorrelation coefficient of aggregate output, suggesting that there is considerable persistence in aggregate economic fluctuations.

The standard DSGE models can easily generate these features of Asian business cycles. For example, closed economy DSGE models with only productivity shocks account for approximately 70% of output variation. Extensions of these models to small open economies can better represent the structural characteristics of the Asian economies. These models can perfectly replicate the volatility features of the Asian business cycles as they generally include external shocks along with domestic productivity disturbances and more complicated sectoral dynamics (see Kose (1999b)). Both closed and open economy versions of these models can generate the high persistence of output in the Asian countries if they are subjected to highly persistent productivity disturbances. In these models, a temporary positive productivity shock induces an increase in investment, which expands the capital stock and causes an increase in production. As the current capital stock increases, this positively affects the future output and makes the current and future output to be positively correlated. In other words, from a qualitative perspective, these models do have internal persistence, which can replicate the persistence properties of output series with ease.

In short, our volatility estimates provide three important results: first, the Asian economies are more volatile than the G7 countries, but not as volatile as several other developing economies studied in the literature. Second, the amplitude of economic fluctuations in these countries seems to be dampening over time. Third, the standard DSGE models can generate the volatility features of cyclical fluctuations.

4.3. Properties of National Expenditure Components

Table 4 presents the average growth rates of consumption, investment, and government spending. The average growth rates of these variables are much larger in the Asian countries than in the G7 countries for the entire period. For example, the average growth rate of consumption (investment) is two (three) times larger in the

---

rates of the two groups decreases.

Asian group. . In both periods, aggregate investment exhibits the highest average growth rate. This observation is consistent with several studies emphasizing the importance of capital accumulation as the primary source of economic growth in the Asian countries.[22]

In Asia, while the growth rate of consumption increases over time, growth rates of investment and government expenditures fall in the second period. In all countries but Malaysia and Thailand, the average growth rate of investment slows down in the second period. Growth rates of investment and government spending vary substantially across countries. For example, the average growth rate of investment ranges from a low of 6.8% in the Philippines to a high of 12.2% in Korea. While the growth rate of government expenditures rises in Indonesia, Korea, the Philippines, and Taiwan in the second period, the other three Asian countries—Malaysia, Singapore, and Thailand—record significantly lower growth rates of government expenditures in the second period.

However, most Asian countries, regardless of the trend in government spending, recorded improved central government budget balances in the 1990s. In fact, when the Asian Crisis hit, most countries had government surpluses, in some cases fairly significant ones. For example, Singapore has a very large government surplus. Malaysia has undergone a long process of fiscal adjustment; from double-digit deficits brought about in large part due to social commitments under the New Economic Policy (aggressive affirmative action). These deficits were not sustainable and an aggressive effort to bring them down significantly was achieved by the mid-1990s. The Philippines had to undergo a costly and difficult political transition--and major natural disasters--during this period. The state took on a larger role in the Taiwanese economy as part of its effect to introduce new industries characterized by economies of scale, in an economy that had hitherto been founded on small- and medium-sized enterprises. While Indonesia continued its liberalization program, the government continued to play a large role in the economy during this period, and it stepped up expenditures on certain high-profile sectors, such as aircraft production and science-related activities.

Consumption growth is more stable across countries; all consumption growth rates are within the neighborhood of one standard deviation from the mean.

[22] See Fu, Huang, and Lovell (1999) for an extensive discussion of this issue.

Interestingly, all countries but the Philippines register a higher consumption growth rate in the second period than in the first period, no doubt due to its economic and political crisis. These results are in line with our findings regarding the growth rates of output and shares of expenditure components in the two sub-periods. In particular, our findings suggest that the average output growth rate is higher than that of the consumption growth rate in the second period. This explains why the share of consumption in aggregate output is smaller in the second period than the first period. The average growth rate of investment is larger than that of output in the second period and this, in turn, results in an increase in the investment share in this interval.

The expenditure components of the G7 countries show significantly smaller growth rates than those of the Asian countries in both periods. In the second period, differences between the two groups become much more evident: consumption (investment) in the Asian countries grows by three (five) times faster than that in the G7 countries. This clarifies why the average share of investment in the Asian countries is much larger than that in the G7 countries in the second period. The average growth rate of government expenditures in every G7 country except Germany decreases in the second period, as does the investment growth rate.

Table 5a presents the volatility of HP filtered national expenditure components. Investment is the most volatile variable and consumption is the least volatile in the Asian and G7 countries. Volatility properties of investment and government spending significantly differ across the Asia. To illustrate, volatility of investment is 6% in Thailand while it is more than 27% in Indonesia in the first period. In the second period, cross-country differences in the volatility of investment become smaller: in all countries but Indonesia, relative volatility of investment to output is within the neighborhood of one standard deviation from the mean.

Table 5b reports standard deviations of expenditure components relative to output. A ratio larger than one in this table indicates that the volatility of the respective variable is greater than that of aggregate output. Business cycles of the Asian economies share several interesting regularities: investment and government spending are more volatile than aggregate output in all of the Asian countries during the entire period. In particular, investment (government spending) is on average four (three) times more volatile than output. Consumption is on average almost as volatile as output in most cases. Consumption series in four of the seven Asian countries display smaller variability than aggregate output.

While relative volatilities of consumption and investment rise in the second period, variability of government spending decreases. On average, relative volatilities of all expenditure components except investment become smaller in the second period in the G7 countries (see table 5b). For example, the average relative volatility of government spending decreases by 50% in the second period. In both periods, investment is two to four times more volatile than output in all countries.

Comparison of volatility dynamics across the two groups also reveals several interesting regularities: first, relative volatilities of expenditure components in the Asian countries are larger than those in the G7 countries. For example, relative volatility of investment is on average 4.22 (4.5) in the Asian countries while it is 2.8 (3.3) in the G7 countries in the first (second) period. The relative volatility of government spending is approximately two times larger in the Asian countries than in the G7 economies. Second, in both groups, while the volatility of expenditure components exhibits significant differences across the two sub-periods, their volatility ranking does not change over time: investment is the most volatile series and government spending exhibits larger variability than consumption.[23]

Standard DSGE models can, both qualitatively and quantitatively, replicate these features: investment fluctuates more than consumption and the volatility of investment is larger than that of output in these models. Extensions of these models, which include endogenous government spending, can also account for the variability of the government expenditures in the Asian countries.[24] The volatility of consumption is relatively too large to be tracked by these models since most one-sector DSGE models produce lower relative volatility of consumption due to consumption smoothing.

Relatively high volatility of consumption in the Asian countries can be explained by two observations: first, we do not have consumption data including both durable and nondurable goods. It is known that the volatility of durable goods consumption is two to four times higher than that of nondurables consumption (see Backus, Kehoe and Kydland (1995)). Second, since consumption smoothing through risk sharing is more prevalent in the G7 countries, these countries exhibit less volatile consumption series than the Asian countries.

[23] Table A1 in appendix IV presents the volatility of FD filtered expenditure components. While these statistics are slightly smaller than those with the HP filtered series, they indicate that both of these filters generate the same qualitative results.

Table 6 presents the cross correlations of expenditure components with output. For the entire period, all three variables are on average contemporaneously positively correlated with output. We define business cycles as fluctuations that simultaneously take place in the components of aggregate output. In this sense, there are business cycles in the Asian countries. Consumption series in all Asian countries except Indonesia are procyclical in both periods. Investment is also procyclical as the correlation coefficient ranges from 0.4 to 0.8 in the first period. In the second period, investment is weakly countercyclical in Indonesia while it is procyclical in all other Asian countries. Government spending is uniformly procyclical in the first period while there is more variation in the correlations between government spending and output in the second period. However, with the exception of Thailand where government spending is countercyclical, government-spending series are positively correlated with output in the second period as well.[25]

Some earlier studies also document the procyclical behavior of consumption and investment series in developing countries (see Kose (1999a) and Mendoza (1995)). Our results regarding cyclical comovement of government expenditures in the Asian countries are consistent with some recent studies. Damle (1997) and Kose (1999b) and Talvi and Vegh (2000) find that government spending is positively correlated with aggregate output in developing countries. However, other studies show opposite results. Agenor, McDermott, and Prasad (1998), using quarterly industrial output data from 1978 to 1995, find that government expenditures in Korea and the Philippines are countercyclical.

If government spending is countercyclical, then it decreases during expansions. This suggests that the government conducts its fiscal policy in a way implied by the standard Keynesian models to stabilize the economy. If government spending is procyclical, then an increase in aggregate output coincides with an increase in government spending. It might be the case that the Asian countries heavily rely on production-based indirect taxes that can prevent them from implementing countercyclical fiscal policy. Moreover, as government coffers increase with an economic expansion, expenditures on pet industrial and other projects become easier

[24] See Ambler and Paquet (1996) for a model including endogenous government policy.
[25] Table A8 in appendix IV presents the lead, lag, and contemporaneous correlations between output and national expenditure components. This table suggests that investment leads (lags) the cycle in Indonesia (Singapore), and it is procyclical in all other countries. Government consumption does not

to undertake. In addition, especially in the ASEAN countries, infrastructural--physical and human capital--needs have increased rapidly with economic growth and governments beginning in the late 1980s came under considerable pressure to increase expenditures on infrastructural projects as growth increased. Another possibility is that during good times, the fiscal authority is under pressure to increase its spending, which simply generates the procyclical behavior of government spending.[26]

Our observations regarding contemporaneous correlations between national expenditure components and output in the Asian economies are compatible with the regularities observed in the data of the G7 countries: consumption and investment series are uniformly procyclical in both periods. Correlations between government spending and output are, however, relatively diverse: government spending in Canada and the U.K. (Canada, France, and the U.K.) are countercyclical in the first (second) period.[27]

Since there are several DSGE models generating procyclical investment and consumption series, these features of the Asian business cycles can also be easily captured by these models. Some extensions of these models, which allow endogenous formation of government policy, can also capture procyclical behavior of government expenditures.

Table 7 shows the persistence properties of national expenditure components. These autocorrelation figures suggest that most components are fairly persistent. Interestingly, macroeconomic aggregates of the Asian countries are as persistent as those of the G7 countries. The standard DSGE models can also generate persistent consumption and investment series that are consistent with the features of macroeconomic time series of the Asian countries.

4.4. Properties of International Trade Components

We examine growth rates of exports and imports in Table 8. The Asian countries have registered remarkably impressive growth rates in their exports and imports for the full sample period. Average growth rates of exports and imports in the

---

show any clear pattern, but it lags the cycle in 4 out of 7 countries. Exports are leading the cycle in Korea and Thailand, and procyclical in other Asian countries.

[26] Talvi and Vegh (2000) explain the procyclical behavior of government expenditures in developing countries using this idea.

[27] We report cross correlations of FD filtered expenditure components in Table A3 in Appendix IV. We find that for the Asian countries, cross-country correlations are smaller with the FD filter than with the HP filter. However, all of the qualitative implications seem to be robust to the filtering method.

Asian countries are around 10% while they are less than 5% in the G7 group. The average growth rate of exports (imports) ranges between 7.6% (7.3%) in Singapore to 14% (11%) in Korea (Taiwan) in the Asian group.

The average growth rate of exports is slightly larger than that of imports in the first period, but this regularity is reversed in the second period in the Asian countries. Interestingly, export and import growth rates in the G7 countries on average decrease in the second period with the exception of the U.S., where the average growth rate of exports rises from 5.1% to 6.4% in the second period. Differences between the growth rates of external balances across the two groups become much larger in the second period: the average growth rates of exports and imports in the Asian countries are roughly two (four) times as large as those of G7 economies in the first (second) period.

Tables 9a and 9b display the standard deviations and relative standard deviations of international trade components, respectively. As these tables suggest, exports, imports, and net exports are more volatile in the Asian countries than in the G7 countries for the full period. Regarding absolute standard deviations, the external accounts of the Asian economies exhibit much larger variability in the first period than those in the second period. In particular, the volatility of exports, imports, and net exports in all Asian economies decreases in the second period. In the first period, the volatility of net exports ranges from a low of 5.6% in Singapore to a high of 17% in Indonesia, while in the second period it is between 4.6% in Malaysia and 7.6% in Korea.

There are two potential explanations for the decrease in the amplitude of cyclical fluctuations in exports and imports: first, as we have already shown in section 3, the Asian economies have expanded their export and import bases and have become more diversified. The shares of manufacturing and services in total output (exports) have increased as the shares of primary goods in total output (exports) have decreased, which made them less vulnerable to external shocks. Second, the volatility of external shocks has decreased in the second period, inducing relatively stable trade dynamics in these countries. For example, in the early 1980s, approximately three-fourths of its export revenues —and a significant percentage of government revenues— came from the oil sector in Indonesia. Decreases in the price of oil and the diversification of the Indonesian economy out of oil—due to deliberate policy

changes to promote manufactures, relative price effects, and depletion of oil reserves—rendered the economy far less susceptible to oil price shocks in the second period.

Table 9b indicates that the averages of relative volatilities of exports, imports, and net exports are also larger in the Asian countries than in G7 countries in all three periods under investigation. However, differences between the relative volatilities of international trade components of the two groups are quite small and they decrease over time.

We study comovement properties of components of international trade in Table 10. Both exports and imports are uniformly procyclical in both the Asian and G7 countries for the whole sample period. In other words, domestic economic activity has a positive impact on the amount of imports, as one would expect. The correlation between exports and output is smaller than that between imports and output in five Asian countries. This suggests that foreign demand plays a more important role in inducing business cycle fluctuations in exports than in imports, again as one would expect. The average correlation of exports with output in the Asian group is two-times larger than that of the G7 countries. This is an intuitively appealing result considering that the share of exports in aggregate output in the Asian economies is more than two times larger than that in the G7 countries. With respect to imports, average correlations are the same in the two groups, but the Asian economies exhibit much higher variation. Net exports are countercyclical in all Asian countries except Indonesia and Korea, while they are uniformly countercyclical in the G7 countries. This implies that these countries register larger deficits during booms than during recessions.

Exports and imports are positively correlated with output in all countries except Indonesia whose exports (imports) are negatively correlated with output in the first (second) period. Net exports are countercyclical in five (four) Asian countries in the first (second) period. In the G7 countries, both exports and imports are procyclical and net exports are countercyclical in the first period. All G7 countries except Canada have countercyclical net exports in the second period.[28]

[28] Our results regarding countercyclical behavior of net exports in the Asian countries are consistent with those in Kose (1999a). Damle (1997) finds that the net exports in Korea, the Philippines, and Thailand are positively correlated with output. She uses annual data covering the period of 1960-1990 from the PWT.

Table 11 presents the persistence properties of international trade components. This table suggests that these series are relatively less persistent than other macroeconomic aggregates. Components of international trade in the G7 countries display similar persistence features to those of the Asian countries.[29]

Open economy versions of DSGE models can account for the volatility and persistence properties of exports, imports, and net exports of the Asian countries. These models can replicate that all three components of international trade are more volatile than output. In response to a positive productivity shock, investment increases in these models. The increase in investment is financed by foreign borrowing. This, in turn, reduces net exports and causes them to be countercyclical in these models.

4.5. Fluctuations in Price Levels and Monetary Aggregates

Table 12 presents information about the behavior of inflation rates generated by the FD filter.[30] For the whole period, the average rate of inflation in the Asian economies is roughly two times larger than that in the G7 countries. If we exclude Indonesia's inflation rate, which is an obvious outlier, the average rate (volatility) of inflation in the full sample is 7.20% (6.74%) which is still larger than that in the G7 countries. The average inflation rate varies a great deal across the Asian countries in our sample: it ranges from a low of 3% in Singapore to a high of more than 31% in Indonesia. Variability of the average inflation rate in the G7 countries is relatively smaller as it takes on values between 3.3% in the U.S. and 8% in Italy. There is a striking difference between the two sub-periods: the average inflation rate significantly decreases in the second period in all Asian countries as it does in the G7 economies. There is also a drastic decrease in the difference between average inflation rates of these two groups in this period. Moreover, the variability in the average inflation rate across the Asian economies seems to be decreasing over time.

On average, inflation is more volatile in Asia than in the G7. In particular, the standard deviation of the inflation rate is roughly three times larger in the Asian countries than the G7 countries. However, the standard deviation of the inflation rate

[29] Tables A5-A8 present the cyclical features of FD filtered international trade components. Some of these statistics are different than those with the HP filtered data. However, most of the qualitative results do not depend on the filtering method.

goes down in the second period, and the difference between the two groups seems to disappear. These findings together suggest that price levels become more stable in the second period in all Asian economies in our sample.

With respect to persistence, the inflation rate in the Asian economies on average displays less persistence and more variation than the G7 countries. The autocorrelation of inflation rates increases in every Asian country but Indonesia in the second period. While rates of inflation on average seem to be countercyclical, there are two exceptions to this regularity: Malaysia and Singapore. For the entire period, price level changes are negatively correlated with aggregate output in all of the G7 countries.

We study volatility, persistence, and comovement properties of price-level fluctuations, which are generated by the HP filter, in Table 13. The volatility of the inflation rate in the Asian economies is almost four times larger than that of the G7 countries. If we exclude Indonesia, the (volatility) of inflation in the full sample reduces to 6.48%, which is still two times larger than that of the G7 countries. In all Asian countries, the inflation rate becomes more stable in this period as the standard deviation of the inflation rate goes down from 14% in the first period to 2% in the second period. In the G7 economies, the volatility of inflation also decreases in the second period. The difference between the volatility of inflation rates of these two groups disappears as price levels become more stable over time. Tables 12 and 13 together suggest that cyclical features of inflation rates are quite robust to the filtering method: while some of the statistics of the FD filtered data are smaller than those of the HP filtered data, qualitative implications of these two filters are not different.

The autocorrelations of inflation rates do not vary much across the Asian group. They are slightly greater in the G7 than Asia. In most cases, the correlation between price-level and output fluctuations is negative all three periods. Our results regarding the countercyclical feature of price fluctuations are consistent with several others in the literature: Backus and Kehoe (1992), Chadha and Prasad (1994), and Fiorito and Kollintzas (1994) show that the prices are countercyclical in the developed economies. Kim (1996) finds that there is a negative correlation between the price level and output fluctuations in Korea and Taiwan. These results support predictions

[30] We investigate some other prices such as terms-of-trade, exchange rate etc. However, we are not able to find data series long enough to lead to some reasonable comparison with the statistics reported in the paper.

of those theories emphasizing the importance of supply shocks in driving economic fluctuations.[31] In these models, supply shock generated fluctuations in output produce countercyclical movements in the price level.

Table 14 presents the properties of the growth rates of money stock, measured by M2. The average growth rate of money stock seems to be stable and it is more than two times more volatile in the Asian countries than that in the G7 countries. The volatility of the growth rate of the money stock is larger in the Asian countries for the whole period. However, there is a significant decrease in the volatility of the growth rate of money stock in the second period in the Asian group, and this reduces the volatility difference between the two groups. The money growth rates in the Asian economies are less persistent than those in the G7 countries. While the growth rate of money is procyclical, it is negatively correlated with the price level in both groups.

We report the cyclical features of money stock fluctuations in Table 15. Volatility and persistence properties of monetary variables are similar to those of price level. Fluctuations in the stock of money are on average roughly two times more volatile in the Asian countries than in the G7 countries for the full sample. There is a great deal of variation in the volatility of the money stock in the Asian group. While the volatility of the money stock goes down by almost 50% in the Asian countries in the second period, it does not change much in the G7 economies. Notably, fluctuations in the money stock are slightly less volatile in the Asian countries than the G7 group in the second period. Money stock fluctuations are slightly less persistent in the Asian economies, and there does not seem to be an obvious change in the autocorrelation of money stock changes over time. In all of the Asian and G7 countries, the money stock is pro-cyclical and there is no evidence suggesting that this property changes over time. Tables 14 and 15 together suggest that business cycle properties of the money stock fluctuations are quite robust to the filtering method.

The standard DSGE models can easily replicate these features of prices and monetary aggregates in the Asian countries. In particular, these models can account for the countercyclical nature of prices with ease as positive productivity shocks increase output in these models and reduce prices. There are also different extensions

[31] The relationship between prices and output fluctuations has been a widely debated subject. Chadha and Prasad (1994) [Kim (1996)] find that while the price level is countercylical, the rate of inflation is

of these models that can produce a weak positive correlation between output and money stock.

5. International Dimensions of Business Cycle Fluctuations

We further examine the similarity of business cycle behavior across the Asian countries by studying the contemporaneous cross-country correlations of output, consumption, investment, government spending, exports, imports, money stock, and prices. We also investigate the existence of a regional business cycle specific to the Asian countries in our sample. We compute the Asian cycle using two different methods. Our first measure of the Asian business cycle, denoted by Asian Cycle 1 (AC1), is constructed using the average growth rates of the respective macroeconomic aggregate of all Asian countries. Our second cycle, denoted by Asian Cycle 2 (AC2), is computed using the weighted average of the growth rates of the respective macroeconomic aggregate of all Asian countries. Each country's weight is determined by its relative size, measured by its GDP, in the Asian group. To investigate the interactions between the cyclical fluctuations in the G7 countries and the Asian economies, we also compute similar cycles specific to the G7 countries. Appendix III provides information about the calculation of these cycles.

Table 16 presents cross-country correlations of output growth rates in the Asian countries and their interactions with our measures of the Asian and G7 cycles for the three periods under consideration. For the entire period, all correlations are positive and in several cases they are significant. More interestingly, the growth rates of output in the Asian countries are positively correlated with both measures of the Asian business cycle. Our findings suggest that the correlations tend to increase over time. For example, 16 out of 21 cross-country correlations become higher in the second period, implying that the degree of comovement across the Asian countries increases over time. The correlations between the growth rates of output in Asian countries and the Asian business cycle get stronger during the second period; in five (six) out of seven Asian countries the correlation of output growth rate with the AC1 (AC2) increases. The correlations between the output growth rates of the Asian countries, except Korea and Taiwan, and the Asian business cycles are larger than those associated with the G7 cycles.

---

procyclical in G7 countries [Korea and Taiwan]. The procyclical inflation rate is compatible with those

Table 17 displays the cross-country correlations of output fluctuations generated by the HP filter. This table also suggests that business cycle fluctuations in the Asian economies exhibit high degrees of comovement. 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. The Asian countries' output fluctuations are positively correlated with the Asian business cycles and they increase in the second period in four out of seven cases. These correlations, except those of Korea and Taiwan, are also larger than those with the G7 cycles. In the majority of the cases, 11 out of 21, there is an increase in the cross-country correlations of output fluctuations over time.[32]

It is not surprising that the economies of Korea and Taiwan move in tandem with the G7 countries: as we discuss in section 3, they have the two largest industry activity shares in aggregate output in the Asian group. Moreover, manufactured items constitute more than 80% of total export revenues in these countries which started their development process at least a decade earlier than the other Asian countries in our sample. Also, the sizes of their economies are much larger than the other Asian countries.

Table 18 examines the consumption correlations across the Asian countries. Consumption correlations are in most cases positive and generally smaller than those of output. This implies that the imperfect consumption risk-sharing puzzle also exists in the data of the most of the Asian countries.[33] We also find cross-country consumption correlations increase over time in most of the Asian countries.

Multi country DSGE models can easily account for high cross-country output correlations observed in the Asian economies by assuming positively correlated productivity shocks and having transmission channels of shocks through trade or investment. Extensions of these models, including models with multiple sectors and

---

models in which business cycles are driven by demand shocks.

[32] In a recent paper, Kose, Otrok, and Whiteman (1999) examine the interactions between world, region, and country components of business cycles in 60 countries and 7 regions of the world. Their results suggest that the world component is quite important in accounting for common fluctuations in aggregate output, consumption, and investment. In Asian countries, the world (regional) component on average explains 7% (5%) of output variation.

[33] If capital markets were complete, then each country would engage in a perfect risk sharing arrangement and completely eliminate country-specific risks. Therefore cross-country correlation of consumption would be near one or at least larger than cross-country correlation of output. See Backus, Kehoe, and Kydland (1995) for more information on the imperfect consumption risk-sharing puzzle.

with incomplete asset markets, can also reproduce cross-country correlations of consumption and investment (see Crucini (1999)).

As Tables 19 and 20 show, correlations of investment and government spending do not exhibit any particular pattern. For example, only 11 out of 21 cross-country correlations of government spending are positive for the whole period. These tables, however, suggest that cross-country correlations of investment and government spending tend to increase in the second period. To illustrate, there is an increase in 18 (13) out of 21 cross-country investment (government spending) correlations in the second period. More interestingly, all of the investment correlations of the Asian countries with the AC1 rise over time.[34]

Regarding correlations of exports and imports across countries, Tables 21 and 22 present that while most of these correlations are positive, they are not significant in the majority of cases. However, both exports and imports fluctuations exhibit a higher degree of comovement across the Asian countries over time, as majority of the correlations increase in the second period.

Table 23 and Table 24 report the cross-country correlations of money stock, measured by M2 and price levels, measured by CPI. Money stock correlations vary considerably across country-pairs and ten out of twenty-one correlations are negative. Unlike other correlation figures, money stock correlations do not exhibit an increasing trend over time, as only eight correlations register an increase in the second period. Interestingly, correlations between money stock of individual countries and AC1 and AC2 are negative and seem to decrease in most of the cases over time. Cross-country correlations of price fluctuations do not display any consistent pattern: for the full period, half of the correlations are positive. However, in case of Indonesia, the cross-country correlations are all negative.[35] Correlations between price levels in each country and the measures of Asian business cycles tend to increase in the second period as cross-country price fluctuations rise in almost all the cases.

Table 25 provides a summary of the information presented in our cross-country correlation tables. Business cycle fluctuations in all of the macroeconomic variables, except government spending and money stock, are positively correlated

[34] Cross-country correlations of FD filtered consumption, investment, and government consumption series are presented in Appendix IV. While some of these correlations are different in sign and magnitude, most of them are comparable to those of the HP filtered data.

across the Asian countries in most cases. For example, cross-country output (exports) correlations are positive in 19 (18) cases out of 21. These variables are also significantly correlated with the measures of the Asian business cycles. Fluctuations in the policy variables, government consumption and money stock, have no clear pattern and do not exhibit strong comovement. Only 11 out of 21 cross-country government and money stock correlations are positive and only 1 out of 7 correlations between these variables and the AC1 is statistically significant. These results suggest that the patterns of policy variables in the Asian countries exhibit lesser degree of comovement than other macroeconomic variables.[36] All these results imply that similar propagation mechanisms are in place transmitting business cycles across the Asian countries. Our findings regarding high degree of comovement across the Asian countries can also be interpreted as evidence for a distinct Asian business cycle.[37]

6. Conclusions

We document stylized business cycle features of the Asian economies and compare those with the cyclical dynamics in the G7 countries. Our definition of business cycle encompasses features regarding volatility, persistence, and co-movements of the deviations of real macroeconomic variables from their long-term trends.

Our analysis of structural characteristics of the Asian countries reveals several interesting regularities: first, the Asian economies are much more open than the G7 countries and they appear to establish a more diversified export base over time. Second, as the Asian economies mature, shares of investment, exports, and imports in total output significantly increase. Third, shares of industrial production and the service sector simultaneously grow, and the role of agricultural sector in the economy significantly diminishes, as the Asian economies develop over time.

We now turn to the questions we asked in the introduction: first, what are the main characteristics of macroeconomic fluctuations in the Asian countries? We find

---

[35] As we already noted in the previous section, price fluctuations in Indonesia are quite unstable in the first period. This probably generates the negative correlations between price fluctuations in this country and the other countries of the region.

[36] These results are consistent with those in Christodulakis, Dimelis, and Kollintzas (1995) who find that unlike policy variables—government expenditure and money— aggregate output, consumption, and investment exhibit similar cyclical dynamics in the European Union economies.

[37] Damle (1997) also examines whether there is a unique Asian business cycle. She does not find large cross country correlations or comovement with the Asian business cycle suggesting that there is a regional business cycle specific to the Asian countries.

that investment and government spending are more volatile than aggregate output. In particular, investment (government spending) is on average four (three) times more volatile than output. Consumption is almost as volatile as output in most cases. All three variables are on average contemporaneously positively correlated with output and they are fairly persistent. Net exports are highly volatile and countercyclical in all Asian countries except Indonesia and Korea.

Second, are the features of business cycles of these economies in this region similar to or different from those of the G7 economies? We find that the Asian economies exhibit more volatile business cycles than the G7 countries do. Moreover, relative volatilities of expenditure components in the Asian countries are larger than those in the G7 countries. For example, relative volatility of government spending is approximately two times larger in Asia than the G7. While our study does not pinpoint a major reason why the Asian economies are more volatile, we consider institutional problems, difficulties associated with development process, absence of well-established financial markets, and some external shocks can be responsible for the higher volatility in these countries.

We also find some important similarities between the cyclical fluctuations in the Asian and G7 countries. For example, comovement and persistence features of expenditure components are similar in both groups. More interestingly, economic fluctuations in the two groups become similar over time, as the volatility of macroeconomic variables decreases. These findings suggest that the Asian economies experience short-term economic fluctuations that can be considered as business cycles similar to those observed in the developed countries.

Third, do we observe a distinct Asian business cycle? We find that business cycle fluctuations in the Asian economies exhibit a high degree of comovement. In the majority of the cases, cross-country correlations are positive for the entire sample. We also find that the growth rates of output in the Asian countries are positively correlated with our measures of the Asian business cycles. We interpret these results as evidence of a regional business cycle specific to the Asian countries in our sample. Korea and Taiwan, which mostly rely on manufactured items for their export earnings, show a stronger cyclical link with the G7 countries than the remaining other Asian countries in our sample.

While the cyclical features of aggregate output, consumption, investment, exports, imports, and net exports are quite similar, the behavior of policy variables,

i.e., government consumption and money stock, is quite different across the Asian countries. This implies that there are important similarities in the types of shocks and their propagation dynamics across these countries and the objectives regarding the long-term economic integration should not be a major problem as far as the features of macroeconomic fluctuations are concerned.

Fourth, have the characteristics of business cycles changed as these economies have matured over time? To answer this question, we compare business cycles in the two sub-periods: 1960-1984 and 1985-1996. We find that the amplitude of business cycle fluctuations dampens over time. Our results also suggest that cross-country correlations of aggregate economic variables tend to increase in the second period. This is consistent with the explanation that these economies have gone through a similar development path and the degree of economic integration has significantly increased over the last three decades. Policy formation, for example, in the ASEAN countries has been similar due to many reasons, including: a common belief in the importance of economic reform with a focus on exports and inward DFI; a perceived need for harmonization of economic policies, or, perhaps more likely, the realization of strong policy externalities; and closer economic cooperation through regional associations such as ASEAN and APEC, including "soft" cooperation such as more meetings between economic ministers and "hard" cooperation such as the ASEAN Free-Trade Area.

Fifth, what do our results mean for the recent economic crisis in these countries? Our results suggest that these economies respond similarly to different types of shocks. This implies that contagion of the Asian crisis can be explained at least in part by the simple transmission of a shock from a source country, in this case Thailand, to other countries in the region. Our findings indicate that Thailand's aggregate output, consumption, investment, exports, and imports are significantly correlated with our measures of the Asian business cycles and these correlations tend to increase in the second period.

REFERENCES

Agenor, P. R., C. J. McDermott, and E. Prasad, 1998, Macroeconomic fluctuations in developing countries: some stylized facts, IMF Working Paper.

Ahmed, S. and P. N. Loungani, 1998, Business cycles in Asia, working paper, Board of Governors of the Federal Reserve System.

Aizenman, J., and N. Marion, 1993, Policy uncertainty, persistence and growth, Review of International Economics 1, 145-163.

Ambler S., and P. Alain, 1996, Fiscal spending shocks, endogenous government spending, and real business cycles, Journal of Economic Dynamics And Control (20)1-3, 237-256.

Backus, D. K., and P. J. Kehoe, 1992, International evidence on the historical properties of business cycles, American Economic Review

Backus, D. K., P. J. Kehoe, and F. E. Kydland, 1992, International real business cycles, Journal of Political Economy 100, 745-775.

Backus, D. K., P. J. Kehoe, and F. E. Kydland, 1994, Dynamics of the trade balance and the terms of trade: the J-curve?, American Economic Review 84, 84-103.

Backus, D. K., P. J. Kehoe, and F. E. Kydland, 1995, International business cycles: Theory and evidence, in Frontier of Business cycle research, Thomas Cooley (ed.), Princeton University Press.

Baxter, M., 1995, International trade and business cycles, in: Handbook of international economics, Gene Grossman and Kenneth Rogoff (eds), Amsterdam: North Holland.

Baxter, M. and R. G. King, 1999, Measuring business cycles approximating band-pass filters for economic time series, Review Economics and Statistics, November.

Bergman, U. M., M. D. Bordo, and L. Jonung, 1998, Historical Evidence on Business Cycles: The International Experience, WP No: 255, Stockholm School of Economics.

Blackburn, K. and M. Ravn, 1992, Business cycles in the UK: facts and fictions, Economica 59, 383-401.

Burns, A. F. and W. C. Mitchell, 1946, Measuring Business Cycles, New York: National Bureau of Economic Research.

Canova, F., 1998, Detrending and business cycle facts, Journal of Monetary Economics (41)3, 475-512.

Canova, F. and H. Dellas, 1993, Trade interdependence and the international business cycle, Journal of International Economics 34, 23-47.

Chadha, B., and E. Prasad, 1994, Are prices countercyclical? Evidence from the G7, Journal of Monetary Economic 34, 239-257.

Christodulakis, N., S. P. Dimelis, and T. Kollintzas, 1995, Comparisons of business cycles in the EC: idiosyncrasies and regularities, Economica 62, 1-27.

Correia, I. H., J. C. Neves, and S. Rebelo, 1992, Business cycles in Portugal: theory and evidence, in J. F. de Amaral, D. Lucena, and A. S. Mello (eds.) The Portuguese Economy Towards 1992. Dordrect: Kluver Academic Publishers, 1-64.

Corsetti, G., P. Pesenti and N. Roubini, 1999, What Caused the Asian Currency and Financial Crisis?, Japan and the World Economy 11(3), 305-373.

Crafts, N., 1999, East Asian growth before and after the crisis, IMF Staff Papers 46, 139-166.

Crucini, M., 1997, Country size and economic fluctuations, Review of International Economics 5, No. 2, 204-220.

Crucini, M., 1999, International Comovement: Is theory ahead of international business cycle measurement?, Working Paper, Ohio State University.

Damle, D., 1997, International aspects of business cycles in Asian emerging market economies, working paper, New York University.

Fiorito, R. and T. Kollintzas, 1994, Stylized facts of business cycles in the G7 from a real business cycle perspective, European Economic Review 38, 235-269.

Fu, T., C. J. Huang, and C. A. K. Lovell, 1999, Economic efficiency and productivity growth in the Asia-Pacific region, Edward Elgar.

Gavin, M., and R. Hausman, 1996, Sources of macroeconomic volatility in developing economies, mimeo, Inter-American Development Bank.

Head, A. C., 1995, Country size, aggregate fluctuations, and international risk sharing, Canadian Journal of Economics 28, 1096-1119.

Hodrick, R. J., and E. Prescott, 1997, Postwar U.S. business cycles: an empirical investigation, Journal of Money Credit and Banking 19, 1-16.

Hoffmaister, A. W., and J. E. Roldos, 1996, Are business cycles different in Asia and Latin America?, IMF Working Paper.

Ito, T. and A. O. Krueger, 1996, Growth theories in light of the East Asian experience, NBER East Asia Seminar on Economics vol. 4, The University of Chicago Press.

Kim, Y. W., 1996, Are prices countercyclical? Evidence from East Asian countries, Federal Reserve Bank of St. Louis Review, 69-82, September/October.

King, R. G. and S. T. Rebelo, 1992, Low frequency filtering and real business cycles, Journal of Economic Dynamics and Control 17, 207-231.

King, R. G., C. Plosser, and S. Rebelo, 1988, Production, growth and business cycles: I. The basic neoclassical model, Journal of Monetary Economics 21, 195-232.

Kose, M. A., 1999a, Explaining business cycles in small open economies, working paper, Brandeis University.

Kose, M. A., 1999b, How important is international risk-sharing for developing economies?, working paper, Brandeis University.

Kose, M. A. and R. Riezman, 1999, Trade Shocks and Economic Dynamics in Africa, working paper, Brandeis University.

Kose, M., A., C. Otrok, and C. Whiteman, 1999, International Business Cycles: World, Region, and Country Specific Factors, working paper, Brandeis University.

Kydland F. E. and E. Prescott, 1982, Time to build and aggregate fluctuations, Econometrica 50, 1345-1370.

Kydland F. E. and E. Prescott, 1990, Business cycles: real facts and monetary myth, Federal Reserve Bank of Minneapolis Quarterly Review 14(2), 3-18.

Lucas R. E. Jr., 1977, Understanding business cycles, in K. Brunner and A. H. Meltzer (eds.) Stabilization of the Domestic and International Economy, Carnegie-Rochester Conference Series on Public Policy, 5. Amsterdam: North-Holland.

Mendoza, E.G., 1995, The terms of trade, the real exchange rate, and economic fluctuations, International Economic Review 36, 101-137.

Mori, K., 1991, Business cycles in Asian countries, in Business cycles in Asia, H. Osada and D. Hiratsuka (eds.), IDE, 151-159.

Ramey, G., and V. A. Ramey, 1995, Cross-country evidence on the link between volatility and growth, American Economic Review 85, 1138-1151.

Summers R. and A. Heston, 1991, The Penn World Table (mark 5): an expanded set of international comparisons, 1950-1998, Quarterly Journal of Economics, 327-368.

Talvi, E. and C. A. Vegh, 2000, Tax base variability and procyclical fiscal policy, NBER Working Paper: 7499.

World Bank, 1993, The East Asian Miracle, Oxford University Press.

Appendix I:

Data Sources and Definitions
(Most data series are taken from the International Financial Statistics (IFS). Unless indicated, the data series are from 1960 to 1996.)

Output: Output is measured as Gross Domestic Product (GDP) at 1990 prices (*line 99b.p or 99b.r*). Gross Domestic Product (*line 99b*) is generally presented in IFS as the sum of final expenditure: Exports of Goods and Services, Imports of Goods and Services, Private Consumption, Government Consumption, Gross Fixed Capital Formation, and Increase/Decrease in Stocks. Except for Malaysia and Taiwan, the output series are from the IFS. For Malaysia and Germany, the GDP at 1990 prices series from the IFS are not available from 1960 to 1969 and from 1960 to 1978, respectively; therefore, the data in those periods are generated by applying the growth rate of the real GDP from the Penn World Table to the series from the IFS. For Taiwan, real GDP is from the Penn World Table (PWT).

GDP Deflator: GDP deflator is the ratio of nominal GDP *(line 99b)* to real GDP (*line 99b.p or 99b.r*). GDP deflator for Taiwan is available from 1960 to 1990 because its nominal GDP series (from the PWT) is available only for that period.

Private Consumption: Except for Taiwan, all private consumption series are from the IFS (*line 96f*). Real private consumption is private consumption deflated by the GDP deflator. Real private consumption series of Taiwan is from the PWT.

Investment: Investment is measured as gross fixed capital formation (*line 93e*). Real investment is investment deflated by the GDP deflator. Real investment series of Taiwan is from the PWT.

Government Consumption: Government consumption series are from the IFS (*line 91f*). Real government consumption is government consumption deflated by the GDP deflator. Real government consumption of Taiwan is from the PWT.

Exports: Exports are measured as exports of goods and services of national accounts (*line 90c*). This series is not available for Singapore, Taiwan, and Germany. For Singapore and Germany, exports are measured as merchandise exports f.o.b. (*line 70*) which are, in general, customs statistics reported under the general trade system according to the recommendations of the UN *International Trade Statistics: Concepts and Definitions*, 1982. For Taiwan, the series of exports is from the PWT. Real export series is export series deflated by the GDP deflator. The export series of Indonesia starts from 1962.

Imports: Imports are measured as imports of goods and services of national accounts (*line 98c*). This series is not available for Singapore, Taiwan, and Germany. For Singapore and Germany, imports are measured as merchandise imports c.i.f. (*line 71*). For Taiwan, the series of imports is from the PWT. Real import series is import series deflated by the GDP deflator.

Saving: Real saving series is defined as real GDP minus real private and government consumption. Saving ratio is defined as saving divided by GDP.

M1: M1 includes transferable deposits and currency outside banks (*line 34*). The M1 series of UK is not available. The M1 series of Indonesia, Singapore, Taiwan, and Italy start from 1965, 1963, 1961, and 1962, respectively. The M1 series of Taiwan is from the central bank of Taiwan. Real M1 is M1 deflated by the GDP deflator.

Quasi-Money: Quasi-money includes time, savings, and foreign currency deposits (*line 35*). The quasi-money series of UK is not available. The quasi money series of Indonesia, Singapore, Taiwan and Italy start from 1965, 1963, 1961, and 1962, respectively. The quasi-money series of Taiwan is from the central bank of Taiwan (M2 minus M1). Real quasi-money is quasi-money deflated by the GDP deflator.

M2: M2 is defined as M1 plus quasi-money. The M2 series of the UK is available from the IFS (*line 35l*). The M2 series of Indonesia, Singapore, Taiwan, and Italy start from 1965, 1963, 1961, and 1962, respectively. The M2 series of Taiwan is from the central bank of Taiwan. Real M2 is M2 deflated by the GDP deflator.

Velocity of Money: Velocity of money is defined as GDP divided by money. The velocity of money series of Indonesia, Singapore, Taiwan, and Italy start from 1965, 1963, 1961, and 1962, respectively.

CPI: Consumer Price Index (CPI) series are from the IFS (*line 64*). The CPI series of Korea starts from 1963. The CPI series of Taiwan is not available.

Export Price: Index for unit value of exports is Laspeyres with weights derived from the data for transactions (*line 74*). The export price series of Korea, Malaysia, Philippines, and Singapore are from 1963 to 1996, from 1960 to 1991, from 1960 to 1991, and from 1979 to 1996, respectively. The export price series of Taiwan is not available.

Import Price: Index for unit value of imports is Laspeyres with weights derived from the data for transactions (*line 75*). The import price series of Korea, Malaysia, Philippines, and Singapore are from 1963 to 1996, from 1960 to 1987, from 1960 to 1991, and from 1974 to 1996, respectively. The export price series of Indonesia and Taiwan are not available.

Terms of Trade: Terms of trade is defined as export price divided by import price. From the availability of export and import price series, the terms of trade series of Korea, Malaysia, Philippines, and Singapore are from 1963 to 1996, from 1960 to 1987, from 1960 to 1991, and from 1979 to 1996, respectively. The terms of trade series of Indonesia and Taiwan are not available.

Exchange Rate: Exchange rates are measured as period averages, of market exchange rates and official exchange rates for countries quoting rates in units of national currency per U.S. dollar (*line rf*). Real exchange rates are defined as the relative price of traded goods in terms of nontraded goods, proxied by the ratio of the product of the exchange rate and the PPI of the U.S. divided by the CPI of home country. The real exchange rates of Indonesia and Korea start from 1967 and 1963, respectively. The real exchange rate series of Taiwan is not available.

Decomposition of GDP, Exports, and Imports: The data on decomposition of GDP, exports and imports are taken from the various issues of the Handbook of International Trade and Development Statistics (Tables 4.1,4.2, and 6.3 in the source). Below we define the relevant series and provide names of some representative commodities in each group for descriptive purposes. SITC codes are also presented in parenthesis.

Food (0+1+22+4): all food items (live animals chiefly for food, vegetables, rice, wheat, animal and vegetable oils, beverages and tobacco, etc.)

Agriculture (2 less (22+27+28)): agricultural raw materials (crude materials except fuels, silk, cotton, etc.)

Metals (27+28+68): ores and metals (fertilizers, base metals, copper, nickel, zinc, tin, lead, etc.)

Primary: food, agriculture, and metals.

Manufacturing (5 to 8 less 68): manufactured goods (chemicals such as medicinal and pharmaceutical products; manufactured goods classified chiefly by material such as leather, wood manufactures, paper; machinery and transport equipment such as food processing machines, engines and motors, road motor vehicles etc.)

Fuels (3): mineral fuels, lubricants and related materials (gas, coal, oils etc.)

Industry: mining and quarrying, manufacturing, construction, electricity, gas and water.

Services: whole sale and retail trade, transports and communication, financing, insurance, real estate and business services, social and personal services, producers of government services and other producers.

Number of Exported Commodities: This number is the number of products exported at the three-digit SITC, Revision 2 level; this figure includes only those products which are greater than $50,000 for the periods before 1984 and greater than $100,000 for the periods from 1984 forward. The data are from the various issues of the Handbook of International Trade and Development Statistics (Table 4.5 in the source).

Export Diversification and Concentration Indices: The indices are from the various issues of the Handbook of International Trade and Development Statistics (Table 4.5 in the source). Export diversification index is the absolute deviation of the country commodity shares from world structure and calculated as

$$D_j = \frac{\sum_i |x_{ij} - x_i|}{2}$$

where x_{ij} = share of commodity i in total exports of country j

x_i = share of commodity i in total world exports

The concentration index is calculated by using the formula

$$C_j = \frac{\sqrt{\sum_{i=1}^{M} (y_i / Y)^2} - \sqrt{1/M}}{1 - \sqrt{1/M}}$$

where $j =$ country index

$y_i =$ value of exports of commodity i

$Y = \sum_{i=1}^{M} y_i$

$M =$ number of products at the three digit SITC level for the relevant year.

Appendix II:

The Band-Pass Filter (BP filter)

The band-pass filter, developed by Baxter and King (1999), is a moving average filter that isolates both high frequency "noise" and low frequency "trends", leaving behind fluctuations at the typical business cycle frequencies. The filter is constructed by combining a low-pass filter and a high-pass filter and imposing constraints that eliminate fluctuations at frequencies higher and lower than those corresponding to typical business cycle frequencies. The frequency cut-offs used in the paper correspond to 2 and 8 years, i.e. when applied to annual data, the band-pass filter takes the form of a six year moving average as follows:

$$y_t^f = \sum_{h=-3}^{3} a_h y_{t-h} = a(L) y_t$$

where L is the lag operator. Baxter and King adjust the band-pass filter with a constraint that the sum of the moving average coefficients is zero ($\Sigma a_h = 0$).

Table B in Appendix IV presents some summary results generated using the BP filter. This table reveals several interesting observations: first, on average, the Asian economies are more volatile than the G7 countries. Second, BP filtered national expenditure components of Asian economies show the same regularities as those of the HP and FD filtered series, i.e. in all of the Asian countries, consumption is almost as volatile as output and investment and government consumption are more volatile than output. Furthermore, on average, investment is four times more volatile than output and government consumption is three times more volatile than output. Third, similar to the HP and FD filtered series, national expenditure components measured by the BP and FD filters are on average contemporaneously positively correlated with output. Exports and imports are on average procyclical while net exports are countercyclical. Fourth, the autocorrelation coefficients of the BP filtered variables are significantly smaller than those of the HP filtered series.

Appendix III:

Definition of the Asian and G7 Cycles

Asian and G7 cycles 1: Asian cycle 1 is constructed using the average growth rates of the respective series of all the Asian countries in our sample. G7 cycle 1 is constructed using the average growth rates of the respective series of the G7 countries.

Asian and G7 cycles 2: Asian cycle 2 is constructed using the weighted average of the growth rates of the respective series of all the Asian countries in our sample. Each country's weight is determined by its relative size, measured by its GDP. G7 cycle 2 is constructed using the weighted average of the growth rates of the respective series of the G7 countries.

When an Asian country is compared with a measure of Asian cycle, that Asian country is excluded from the Asian cycle. Similarly, when a G7 country is compared to a measure of G7 Cycle, that G7 country is excluded from the G7 cycle.

Table 1a
Components of National Expenditure (%)

Country	1960-1984							1985-1996							1960-1996						
	C/Y	I/Y	G/Y	X/Y	M/Y	(X+M)/Y	NX/Y	C/Y	I/Y	G/Y	X/Y	M/Y	(X+M)/Y	NX/Y	C/Y	I/Y	G/Y	X/Y	M/Y	(X+M)/Y	NX/Y
Asia																					
Indonesia	73.92	16.81	9.16	18.38	18.11	36.49	0.28	57.70	32.07	9.18	25.35	24.31	49.66	1.04	68.36	22.05	9.17	20.77	20.23	41.00	0.54
Korea	72.17	22.94	10.72	20.47	27.54	48.01	-7.07	53.83	33.72	10.26	32.89	31.53	64.42	1.36	66.22	26.43	10.57	24.50	28.83	53.33	-4.34
Malaysia	58.44	22.05	16.00	48.41	45.70	94.10	2.71	50.00	33.29	13.92	77.38	76.92	154.30	0.46	55.70	25.69	15.33	57.80	55.82	113.63	1.98
Philippines	70.40	20.06	8.74	17.73	20.31	38.04	-2.59	72.95	20.40	9.70	30.15	33.42	63.56	-3.27	71.22	20.17	9.05	21.75	24.56	46.32	-2.81
Singapore	65.47	30.39	10.52	115.67	150.90	266.58	-10.23	44.77	34.38	10.33	135.75	151.27	287.02	9.11	58.76	31.68	10.46	122.19	151.02	273.21	-3.96
Taiwan	60.82	21.92	17.84	35.31	34.64	69.95	-0.58	56.61	22.77	15.30	52.02	43.00	95.01	6.63	59.45	22.19	17.02	38.55	36.25	74.80	0.82
Thailand	68.22	22.74	10.88	19.38	22.65	42.03	-3.27	56.59	35.74	10.45	34.20	37.73	71.92	-3.53	64.45	26.96	10.74	24.18	27.54	51.72	-3.35
Mean	***67.06***	***22.42***	***11.98***	***39.34***	***45.69***	***85.03***	***-2.96***	***56.06***	***30.34***	***11.31***	***55.39***	***56.88***	***112.27***	***1.69***	***63.45***	***25.02***	***11.76***	***44.25***	***49.18***	***93.43***	***-1.59***
Std.	***5.80***	***4.11***	***3.51***	***35.56***	***47.36***	***82.72***	***4.44***	***8.73***	***6.12***	***2.33***	***39.68***	***44.95***	***84.47***	***4.72***	***5.65***	***3.89***	***3.12***	***36.83***	***46.38***	***83.06***	***2.61***
G7																					
Canada	58.51	22.41	17.63	22.50	21.64	44.14	0.86	59.22	19.63	20.24	29.07	28.35	57.42	0.72	58.74	21.51	18.48	24.63	23.81	48.45	0.82
France	59.52	22.86	15.80	17.14	16.77	33.91	0.37	60.05	19.58	19.16	22.53	21.44	43.97	1.08	59.69	21.80	16.89	18.89	18.28	37.17	0.60
Germany	56.25	23.14	17.52	20.17	17.75	37.92	2.43	56.35	20.95	19.59	24.67	21.06	45.73	3.61	56.28	22.43	18.19	21.63	18.82	40.45	2.81
Italy	62.43	22.71	14.78	16.89	18.27	35.17	-1.38	62.31	18.97	17.23	19.92	19.34	39.26	0.59	62.39	21.50	15.58	17.88	18.62	36.49	-0.74
Japan	56.96	31.77	8.71	11.60	10.88	22.48	0.72	58.68	29.44	9.38	10.47	8.38	18.84	2.09	57.52	31.01	8.93	11.23	10.07	21.30	1.16
UK	62.49	18.19	19.22	23.29	23.58	46.87	-0.29	63.28	17.03	20.98	25.51	27.01	52.53	-1.50	62.74	17.82	19.79	24.01	24.69	48.71	-0.68
US	62.37	15.34	21.52	6.61	6.84	13.45	-0.23	66.86	14.29	20.09	9.48	11.07	20.54	-1.59	63.83	15.00	21.05	7.54	8.21	15.75	-0.67
Mean	***59.79***	***22.35***	***16.46***	***16.89***	***16.53***	***33.42***	***0.36***	***60.96***	***19.98***	***18.09***	***20.23***	***19.52***	***39.76***	***0.71***	***60.17***	***21.58***	***16.99***	***17.97***	***17.50***	***35.47***	***0.47***
Std.	***2.68***	***5.10***	***4.06***	***6.01***	***5.86***	***11.82***	***1.19***	***3.47***	***4.70***	***4.02***	***7.55***	***7.48***	***14.92***	***1.86***	***2.87***	***4.95***	***3.98***	***6.45***	***6.28***	***12.66***	***1.30***

Notes: Net exports are exports minus imports. Y, C, I, G, X, M, and NX stands for output, consumption, investment, government consumption, exports, imports, and net exports, respectively.

Table 1b
Decomposition of Output (%)

Country	1960-1984			1985-1996			1960-1996		
	Agriculture	**Industry**	**Services**	**Agriculture**	**Industry**	**Services**	**Agriculture**	**Industry**	**Services**
Asia									
Indonesia	38.50	27.25	34.00	21.00	38.67	40.67	31.00	32.14	36.86
Korea	25.50	31.50	42.75	11.50	42.00	46.50	20.83	35.00	44.00
Malaysia	29.25	27.25	39.75	15.00	44.50	40.00	24.50	33.00	39.83
Philippines	27.75	31.50	39.50	23.33	33.00	43.33	25.86	32.14	41.14
Singapore	2.00	30.00	67.25	2.67	37.00	60.33	2.29	33.00	64.29
Taiwan	12.00	41.50	46.50	4.33	42.00	53.67	7.40	41.80	50.80
Thailand	30.00	24.75	45.25	13.33	35.33	51.00	22.86	29.29	47.71
Mean	***23.57***	***30.54***	***45.00***	***13.02***	***38.93***	***47.93***	***19.25***	***33.77***	***46.38***
Std.	***12.36***	***5.44***	***10.66***	***7.74***	***4.12***	***7.47***	***10.43***	***3.93***	***9.21***
G7									
Canada	4.50	34.50	58.00	3.00	32.00	65.00	4.20	34.00	59.40
France	4.75	45.25	47.25	2.50	28.50	69.00	4.00	39.67	54.50
Germany	3.50	48.50	47.25	2.00	43.00	55.50	3.00	46.67	50.00
Italy	8.75	41.00	49.50	3.67	32.33	63.67	6.57	37.29	55.57
Japan	7.00	44.00	50.50	2.33	41.00	56.67	5.00	42.71	53.14
UK	2.75	41.75	53.00	2.00	35.50	62.50	2.50	39.67	56.17
US	3.25	34.75	61.50	2.00	29.00	69.00	3.00	33.60	63.00
Mean	***4.93***	***41.39***	***52.43***	***2.50***	***34.48***	***63.05***	***4.04***	***39.09***	***55.97***
Std.	***2.19***	***5.23***	***5.47***	***0.63***	***5.67***	***5.37***	***1.41***	***4.66***	***4.23***

Notes: The data on decomposition of GDP are from the various issues of the Handbook of International Trade and Development Statistics.

Table 1c
Decomposition of Exports (%)

Country	1960-1984			1985-1996			1960-1996		
	Primary	**Manufacturing**	**Fuels**	**Primary**	**Manufacturing**	**Fuels**	**Primary**	**Manufacturing**	**Fuels**
Asia									
Indonesia	43.50	2.10	54.31	21.63	32.37	46.00	34.13	15.07	50.75
Korea	23.84	74.86	1.12	5.17	92.70	2.03	15.84	82.50	1.51
Malaysia	74.29	12.06	12.93	28.50	51.90	18.93	54.66	29.13	15.50
Philippines	81.93	11.47	1.19	30.13	35.33	1.53	59.73	21.70	1.33
Singapore	34.41	35.25	26.36	10.37	68.87	17.27	24.10	49.66	22.46
Taiwan	17.20	81.57	1.07	7.00	91.73	1.03	12.10	86.65	1.05
Thailand	85.61	11.64	0.33	39.97	58.10	0.93	66.05	31.55	0.59
Mean	***51.54***	***32.71***	***13.90***	***20.40***	***61.57***	***12.53***	***38.09***	***45.18***	***13.31***
Std.	***28.60***	***32.73***	***20.26***	***13.27***	***24.42***	***16.74***	***22.01***	***28.97***	***18.64***
G7									
Canada	44.47	44.64	10.47	25.10	59.93	11.07	36.17	51.20	10.73
France	25.43	70.85	3.01	20.03	75.87	2.93	23.12	73.00	2.98
Germany	10.54	84.43	3.47	8.77	87.60	1.70	9.78	85.79	2.71
Italy	13.55	80.26	5.52	9.07	87.37	2.77	11.63	83.30	4.34
Japan	9.52	89.23	0.34	2.20	95.80	0.47	6.38	92.04	0.39
UK	14.58	77.05	5.63	11.07	75.30	11.73	13.07	76.30	8.25
US	28.78	64.39	3.78	18.77	73.60	3.30	24.49	68.34	3.57
Mean	***20.98***	***72.98***	***4.60***	***13.57***	***79.35***	***4.85***	***17.80***	***75.71***	***4.71***
Std.	***12.71***	***14.98***	***3.14***	***7.96***	***11.84***	***4.57***	***10.53***	***13.47***	***3.55***

Notes: The data on decomposition of exports are from the various issues of the Handbook of International Trade and Development Statistics. Primary sector includes all food items, agricultural raw materials, and ores and metals. Manufacturing is composed of chemical products, other manufactured good, and machinery and equipment. Fuels are mineral fuels, lubricants, and related materials (gas, coal, oil, etc.)

Table 1d
Export Concentration and Diversification Indices

Country	1960-1984			1985-1996			1960-1996		
	NCE	EDI	ECI	NCE	EDI	ECI	NCE	EDI	ECI
Asia									
Indonesia	61	0.80	0.47	176	0.67	0.29	118	0.73	0.38
Korea	122	0.72	0.25	193	0.52	0.14	157	0.62	0.20
Malaysia	132	0.75	0.34	201	0.57	0.21	166	0.66	0.27
Philippines	82	0.85	0.29	165	0.70	0.30	124	0.77	0.29
Singapore	161	0.60	0.30	210	0.50	0.21	186	0.56	0.26
Taiwan	132	0.64	0.16	199	0.52	0.11	183	0.55	0.12
Thailand	94	0.82	0.27	189	0.60	0.11	142	0.71	0.19
Mean	***112***	***0.74***	***0.30***	***190***	***0.58***	***0.20***	***154***	***0.66***	***0.24***
Std.	***34***	***0.09***	***0.09***	***15***	***0.08***	***0.08***	***27***	***0.09***	***0.09***
G7									
Canada	167	0.51	0.18	211	0.43	0.17	189	0.47	0.18
France	179	0.27	0.09	218	0.26	0.07	199	0.27	0.08
Germany	178	0.36	0.13	217	0.28	0.10	197	0.32	0.12
Italy	172	0.39	0.11	215	0.36	0.07	194	0.37	0.09
Japan	163	0.46	0.14	203	0.45	0.17	183	0.46	0.15
UK	177	0.33	0.10	217	0.24	0.09	197	0.29	0.10
US	179	0.35	0.11	217	0.31	0.09	198	0.33	0.10
Mean	***174***	***0.38***	***0.12***	***214***	***0.33***	***0.11***	***194***	***0.36***	***0.12***
Std.	***6***	***0.08***	***0.03***	***5***	***0.08***	***0.04***	***6***	***0.08***	***0.04***

Notes: NCD: Number of commodities exported; CI: Concentration index; DI: Diversification Index. The data on export concentration and diversification indices are from the various issues of the Handbook of International Trade and Development Statistics.

Table 1e
Decomposition of Imports (%)

Country	1960-1984			1985-1996			1960-1996		
	Primary	Manufacturing	Fuels	Primary	Manufacturing	Fuels	Primary	Manufacturing	Fuels
Asia									
Indonesia	17.13	76.10	6.54	16.13	73.97	9.63	16.70	75.19	7.86
Korea	35.59	48.69	15.71	18.93	62.83	17.90	28.45	54.75	16.65
Malaysia	27.50	57.97	13.38	12.60	79.83	6.57	21.11	67.34	10.46
Philippines	20.75	56.63	17.89	14.77	49.37	17.27	18.18	53.52	17.62
Singapore	26.76	51.51	20.04	10.43	70.60	17.83	19.76	59.69	19.09
Taiwan	27.63	57.07	14.43	18.93	65.70	12.93	23.28	61.38	13.68
Thailand	14.00	64.08	17.30	12.57	71.93	12.93	13.38	67.44	15.43
Mean	***24.19***	***58.86***	***15.04***	***14.91***	***67.75***	***13.58***	***20.13***	***62.76***	***14.40***
Std.	***7.36***	***9.05***	***4.36***	***3.29***	***9.80***	***4.40***	***4.85***	***7.73***	***4.03***
G7									
Canada	16.50	72.39	9.32	10.43	81.80	5.33	13.90	76.42	7.61
France	28.66	51.99	19.27	17.10	70.00	12.90	23.71	59.71	16.54
Germany	33.70	48.54	14.20	18.47	67.40	11.50	27.17	56.62	13.04
Italy	37.92	40.50	21.16	23.53	59.40	14.96	31.75	48.60	18.50
Japan	46.10	19.73	33.73	29.37	41.27	28.13	38.93	28.96	31.33
UK	39.10	46.19	13.13	17.50	73.87	7.40	29.84	58.05	10.67
US	27.01	50.69	19.53	10.63	74.13	12.33	19.99	60.74	16.44
Mean	***32.71***	***47.15***	***18.62***	***18.15***	***66.84***	***13.22***	***26.47***	***55.59***	***16.31***
Std.	***9.66***	***15.66***	***7.88***	***6.74***	***13.20***	***7.36***	***8.19***	***14.39***	***7.62***

Notes: The data on decomposition of exports are from the various issues of the Handbook of International Trade and Development Statistics. Primary sector includes all food items, agricultural raw materials, and ores and metals. Manufacturing is composed of chemical products, other manufactured good, and machinery and equipment. Fuels are mineral fuels, lubricants, and related materials (gas, coal, oil, etc.)

Table 2
Properties of Output Growth Rates
(FD)

Country	Mean			Volatility			Persistence		
	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996
Asia									
Indonesia	5.56	6.59	5.79	3.28	0.95	2.81	0.48	0.67	0.47
Korea	8.07	8.25	8.07	3.46	2.13	3.05	0.05	0.36	0.06
Malaysia	6.53	7.52	6.62	3.39	2.41	3.33	0.02	0.82	0.20
Philippines	4.60	3.59	3.95	2.99	2.26	3.39	0.49	0.62	0.60
Singapore	8.61	8.04	8.15	3.53	2.43	3.57	0.37	0.04	0.39
Taiwan	8.36	7.32	8.01	2.75	2.18	2.59	0.25	0.23	0.26
Thailand	6.96	8.68	7.42	2.14	2.22	2.30	0.15	0.43	0.39
Mean	***6.96***	***7.14***	***6.86***	***3.08***	***2.08***	***3.01***	***0.26***	***0.45***	***0.34***
Std.	***1.51***	***1.71***	***1.55***	***0.50***	***0.51***	***0.46***	***0.19***	***0.27***	***0.18***
G7									
Canada	4.36	2.10	3.68	2.28	1.99	2.38	0.16	0.59	0.41
France	3.85	2.07	3.25	1.91	1.58	1.96	0.61	0.30	0.63
Germany	2.67	3.26	2.84	3.69	3.47	3.53	0.53	0.20	0.44
Italy	4.25	1.90	3.49	3.03	1.45	2.80	0.23	0.43	0.36
Japan	5.97	3.00	5.03	4.18	1.90	3.80	0.16	0.68	0.30
UK	2.23	2.27	2.28	2.11	2.23	2.10	0.15	0.66	0.33
US	3.10	2.29	2.85	2.37	1.34	2.09	0.27	0.25	0.29
Mean	***3.77***	***2.41***	***3.35***	***2.80***	***2.00***	***2.67***	***0.30***	***0.45***	***0.39***
Std.	***1.26***	***0.51***	***0.88***	***0.86***	***0.72***	***0.74***	***0.19***	***0.20***	***0.12***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Mean is the average growth rate of the filtered series. Volatility is measured by the standard deviation and persistence is measured by the first order autocorrelation of the filtered series. The reported statistic of persistence for the 60-96 period is significant at 5% level if it lies outside of [-0.32 , 0.32].

Table 3
Properties of Output Fluctuations
(HP)

Country	Volatility			Persistence		
	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996
Asia						
Indonesia	3.14	0.96	2.75	0.71	0.56	0.72
Korea	3.19	2.14	3.05	0.46	0.57	0.55
Malaysia	3.01	2.17	3.39	0.48	0.30	0.62
Philippines	2.80	2.57	3.78	0.46	0.65	0.73
Singapore	4.36	1.76	4.12	0.75	-0.01	0.71
Taiwan	2.52	2.25	2.54	0.49	0.68	0.56
Thailand	1.98	2.18	2.59	0.50	0.52	0.69
Mean	***3.00***	***2.00***	***3.17***	***0.55***	***0.47***	***0.66***
Std.	***0.73***	***0.52***	***0.61***	***0.12***	***0.24***	***0.08***
G7						
Canada	1.80	2.21	2.07	0.42	0.64	0.59
France	1.16	1.70	1.38	0.52	0.65	0.62
Germany	3.03	3.31	3.24	0.57	0.50	0.60
Italy	2.31	1.59	2.07	0.42	0.67	0.47
Japan	3.48	2.37	3.14	0.48	0.78	0.54
UK	1.65	2.62	2.26	0.29	0.67	0.63
US	2.03	1.34	1.95	0.43	0.53	0.53
Mean	***2.21***	***2.16***	***2.30***	***0.45***	***0.63***	***0.57***
Std.	***0.81***	***0.68***	***0.67***	***0.09***	***0.09***	***0.06***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Volatility is measured by the standard deviation and persistence is measured by the first order autocorrelation coefficient of the filtered series. The reported statistic of persistence for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 4
Properties of National Expenditure Components
(Mean: FD)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	4.54	7.09	5.20	7.55	7.43	7.56	1.70	2.98	2.40
Korea	6.54	7.49	6.79	12.15	10.57	11.45	6.49	8.76	7.20
Malaysia	5.62	6.39	5.79	10.61	10.68	10.12	7.10	4.89	6.29
Philippines	4.19	3.58	3.85	6.84	6.80	5.49	4.17	7.69	5.14
Singapore	5.89	7.10	6.13	16.86	6.72	12.91	9.31	3.79	8.09
Taiwan	7.62	7.85	7.70	10.39	6.71	9.16	6.46	7.14	6.69
Thailand	6.40	7.47	6.61	9.94	12.44	10.41	8.16	6.09	7.50
Mean	***5.83***	***6.71***	***6.01***	***10.62***	***8.76***	***9.59***	***6.20***	***5.91***	***6.19***
Std.	***1.19***	***1.45***	***1.24***	***3.31***	***2.40***	***2.47***	***2.54***	***2.12***	***1.92***
G7									
Canada	3.76	2.23	3.36	3.68	0.86	2.94	6.04	2.37	4.87
France	3.80	2.02	3.22	3.68	1.16	2.86	5.53	2.14	4.36
Germany	2.71	3.39	2.88	1.87	3.92	2.43	4.36	3.16	3.94
Italy	4.15	1.87	3.43	3.98	0.09	2.70	5.19	1.71	4.08
Japan	6.02	3.14	5.09	5.78	3.70	5.10	6.81	3.09	5.56
UK	1.89	2.71	2.18	2.37	1.36	2.11	3.43	2.21	2.96
US	3.15	2.77	3.07	3.71	0.99	2.84	2.88	1.13	2.42
Mean	***3.64***	***2.59***	***3.32***	***3.58***	***1.73***	***3.00***	***4.89***	***2.26***	***4.03***
Std.	***1.30***	***0.57***	***0.88***	***1.25***	***1.48***	***0.97***	***1.41***	***0.72***	***1.07***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Mean is the average growth rate of the filtered series.

Table 5a
Properties of National Expenditure Components
(Volatility: HP)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	3.26	5.17	3.93	27.05	6.90	22.36	24.73	5.55	20.32
Korea	2.36	1.71	2.27	12.82	6.50	11.36	9.33	2.38	7.86
Malaysia	4.02	4.75	4.68	11.94	11.44	14.09	7.68	3.38	6.74
Philippines	2.55	1.45	2.70	11.22	7.98	15.34	6.83	5.86	7.87
Singapore	3.81	2.09	3.72	12.75	7.55	12.95	7.07	5.15	7.44
Taiwan	1.86	4.38	2.99	8.08	8.04	9.00	3.82	10.07	6.62
Thailand	2.10	1.75	2.42	5.75	9.24	8.18	6.28	5.84	6.50
Mean	***2.85***	***3.04***	***3.24***	***12.80***	***8.23***	***13.32***	***9.39***	***5.46***	***9.05***
Std.	***0.85***	***1.64***	***0.89***	***6.81***	***1.67***	***4.75***	***6.96***	***2.43***	***5.00***
G7									
Canada	1.55	1.72	1.97	5.89	7.00	6.53	2.74	2.06	2.44
France	1.08	1.10	1.05	3.17	6.23	4.77	2.44	1.10	2.16
Germany	2.35	4.46	3.25	7.72	7.20	7.74	4.13	4.87	4.41
Italy	2.57	1.42	2.22	7.16	5.34	6.54	3.58	3.31	3.41
Japan	2.42	1.42	2.07	7.04	6.00	6.90	3.89	0.72	3.07
UK	1.94	2.92	2.61	4.50	10.14	7.46	*2.98*	0.93	2.49
US	1.83	1.31	1.85	6.42	6.06	6.30	2.10	1.44	2.22
Mean	***1.96***	***2.05***	***2.15***	***5.99***	***6.85***	***6.61***	***3.12***	***2.06***	***2.89***
Std.	***0.53***	***1.22***	***0.68***	***1.62***	***1.58***	***0.96***	***0.76***	***1.52***	***0.81***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Volatility is measured by the standard deviation of the filtered series.

Table 5b
Properties of National Expenditure Components
(Relative Volatility: HP)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	1.04	5.38	1.43	8.61	7.18	8.13	7.88	5.78	7.39
Korea	0.74	0.80	0.74	4.02	3.03	3.72	2.93	1.11	2.58
Malaysia	1.33	2.19	1.38	3.96	5.27	4.16	2.55	1.56	1.99
Philippines	0.91	0.56	0.71	4.00	3.11	4.06	2.44	2.28	2.08
Singapore	0.87	1.19	0.90	2.92	4.29	3.14	1.62	2.93	1.81
Taiwan	0.74	1.95	1.18	3.20	3.57	3.55	1.51	4.47	2.61
Thailand	1.06	0.80	0.93	2.90	4.24	3.15	3.16	2.68	2.50
Mean	***0.96***	***1.84***	***1.04***	***4.23***	***4.39***	***4.27***	***3.16***	***2.97***	***2.99***
Std.	***0.21***	***1.68***	***0.29***	***2.00***	***1.46***	***1.75***	***2.17***	***1.64***	***1.96***
G7									
Canada	0.86	0.78	0.95	3.28	3.16	3.15	1.52	0.93	1.18
France	0.93	0.65	0.76	2.73	3.67	3.46	2.10	0.65	1.57
Germany	0.77	1.34	1.01	2.54	2.17	2.39	1.36	1.47	1.36
Italy	1.11	0.89	1.07	3.10	3.35	3.15	1.55	2.08	1.65
Japan	0.70	0.60	0.66	2.02	2.53	2.20	1.12	0.30	0.98
UK	1.18	1.12	1.16	2.73	3.88	3.30	1.81	0.35	1.10
US	0.90	0.98	0.95	3.16	4.53	3.23	1.03	1.08	1.14
Mean	***0.92***	***0.91***	***0.94***	***2.79***	***3.33***	***2.98***	***1.50***	***0.98***	***1.28***
Std.	***0.17***	***0.26***	***0.17***	***0.43***	***0.80***	***0.49***	***0.37***	***0.63***	***0.25***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Relative volatility is the ratio of the standard deviation of the filtered series to that of filtered output.

Table 6
Properties of National Expenditure Components
(Contemporaneous Comovement with Output: HP)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	-0.08	0.62	0.10	0.64	-0.19	0.59	0.49	0.44	0.45
Korea	0.45	0.01	0.38	0.41	0.60	0.45	0.24	0.21	0.23
Malaysia	0.54	0.75	0.69	0.70	0.90	0.83	0.38	0.28	0.42
Philippines	0.69	0.48	0.77	0.77	0.66	0.88	0.82	0.98	0.82
Singapore	0.83	0.32	0.68	0.38	0.29	0.48	0.68	0.00	0.28
Taiwan	0.86	0.44	0.62	0.69	0.89	0.76	0.20	0.15	0.23
Thailand	0.54	0.60	0.70	0.64	0.95	0.83	0.57	-0.32	0.14
Mean	***0.55***	***0.46***	***0.56***	***0.61***	***0.58***	***0.69***	***0.48***	***0.25***	***0.37***
Std.	***0.32***	***0.24***	***0.24***	***0.15***	***0.41***	***0.18***	***0.23***	***0.40***	***0.23***
G7									
Canada	0.82	0.60	0.78	0.73	0.94	0.81	-0.26	-0.51	-0.35
France	0.31	0.95	0.51	0.80	0.97	0.90	0.41	-0.62	0.00
Germany	0.93	0.96	0.90	0.84	0.99	0.88	0.62	0.87	0.73
Italy	0.82	0.94	0.83	0.53	0.92	0.60	0.20	0.63	0.25
Japan	0.82	0.95	0.83	0.94	0.98	0.93	0.33	0.36	0.29
UK	0.81	0.96	0.92	0.76	0.95	0.89	*-0.16*	-0.25	-0.12
US	0.69	0.96	0.78	0.83	0.69	0.77	*0.23*	0.21	0.36
Mean	***0.74***	***0.90***	***0.79***	***0.78***	***0.92***	***0.83***	***0.20***	***0.10***	***0.17***
Std.	***0.20***	***0.13***	***0.13***	***0.13***	***0.10***	***0.12***	***0.31***	***0.57***	***0.35***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Contemporaneous comovement with output is measured by the correlation between the filtered series and filtered output. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 7
Properties of National Expenditure Components
(Persistence: HP)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	0.03	0.50	0.28	0.34	0.39	0.35	0.41	0.41	0.41
Korea	0.33	0.51	0.44	0.53	0.63	0.56	0.57	0.50	0.59
Malaysia	0.30	0.44	0.52	0.61	0.38	0.73	0.23	-0.06	0.29
Philippines	0.54	0.41	0.69	0.45	0.31	0.69	0.30	0.63	0.64
Singapore	0.59	0.51	0.64	0.66	0.35	0.70	0.67	0.27	0.60
Taiwan	0.43	0.56	0.56	0.42	0.53	0.44	0.26	0.45	0.54
Thailand	0.19	0.23	0.48	0.57	0.62	0.69	0.63	0.70	0.71
Mean	***0.34***	***0.45***	***0.52***	***0.51***	***0.46***	***0.59***	***0.44***	***0.41***	***0.54***
Std.	***0.20***	***0.11***	***0.14***	***0.11***	***0.13***	***0.15***	***0.18***	***0.25***	***0.14***
G7									
Canada	0.42	0.47	0.65	0.57	0.63	0.64	0.52	0.60	0.51
France	0.20	0.67	0.39	0.46	0.76	0.71	0.54	0.42	0.61
Germany	0.54	0.45	0.56	0.63	0.53	0.63	0.68	0.41	0.60
Italy	0.43	0.49	0.44	0.54	0.55	0.55	0.46	0.70	0.52
Japan	0.26	0.74	0.31	0.53	0.75	0.61	0.69	0.33	0.68
UK	0.44	0.63	0.68	0.32	0.69	0.68	0.63	0.18	0.60
US	0.04	0.52	0.32	0.39	0.65	0.47	0.47	0.52	0.63
Mean	***0.33***	***0.57***	***0.48***	***0.49***	***0.65***	***0.61***	***0.57***	***0.45***	***0.59***
Std.	***0.17***	***0.11***	***0.15***	***0.11***	***0.09***	***0.08***	***0.10***	***0.17***	***0.06***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Persistence is measured by the first order autocorrelation coefficient of the filtered series. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 8
Properties of International Trade Components
(Mean: FD)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	11.49	7.95	9.66	10.82	8.91	9.73	0.67	-0.96	-0.07
Korea	17.88	7.78	14.35	12.32	9.18	10.98	5.55	-1.39	3.37
Malaysia	6.39	12.22	7.99	7.28	13.01	8.66	-0.90	-0.79	-0.67
Philippines	8.00	8.35	7.67	8.26	10.97	8.27	-0.26	-2.63	-0.60
Singapore	7.66	8.32	7.62	7.73	7.48	7.31	-0.06	0.84	0.31
Taiwan	14.62	-	12.88	12.23	-	11.07	2.39	-	1.81
Thailand	7.90	13.46	9.67	8.33	13.71	9.84	-0.43	-0.25	-0.18
Mean	***10.56***	***9.68***	***9.98***	***9.57***	***10.54***	***9.41***	***1.00***	***-0.86***	***0.57***
Std.	***4.29***	***2.49***	***2.66***	***2.16***	***2.46***	***1.40***	***2.28***	***1.16***	***1.49***
G7									
Canada	6.47	5.06	5.98	5.64	4.93	5.50	0.84	0.13	0.48
France	6.15	2.14	4.78	6.89	1.36	5.03	-0.74	0.79	-0.25
Germany	5.03	0.74	3.79	5.03	0.86	3.74	0.01	-0.12	0.05
Italy	6.49	3.27	5.42	6.28	0.79	4.52	0.21	2.48	0.90
Japan	7.37	-0.40	4.83	6.72	1.50	4.79	0.66	-1.90	0.03
UK	3.67	2.49	3.35	3.41	3.00	3.21	0.26	-0.51	0.14
US	5.10	6.41	5.25	6.74	4.44	5.83	-1.64	1.97	-0.58
Mean	***5.76***	***2.82***	***4.77***	***5.81***	***2.41***	***4.66***	***-0.06***	***0.40***	***0.11***
Std.	***1.23***	***2.36***	***0.92***	***1.26***	***1.72***	***0.93***	***0.86***	***1.50***	***0.48***

Note: All data are real at 1990 prices and logged and detrended using the FD filter. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Mean is the average growth rate of the filtered series.

Table 9a
Properties of International Trade Components
(Volatility: HP)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	21.66	6.07	18.32	21.42	5.44	17.96	16.93	5.46	13.98
Korea	11.99	9.14	10.96	10.09	5.09	8.71	11.21	7.58	10.48
Malaysia	7.28	4.63	7.17	8.68	8.30	10.29	8.75	4.59	8.29
Philippines	14.66	5.48	12.57	15.60	5.65	15.05	9.25	5.56	9.60
Singapore	10.90	6.67	9.88	10.41	5.98	9.77	5.61	2.25	4.85
Taiwan	8.81	-	8.11	9.20	-	8.60	8.17	-	8.12
Thailand	7.45	6.68	8.23	7.83	10.21	10.19	7.03	6.31	7.44
Mean	***11.82***	***6.44***	***10.75***	***11.89***	***6.78***	***11.51***	***9.56***	***5.29***	***8.97***
Std.	***5.08***	***1.53***	***3.82***	***4.90***	***2.03***	***3.57***	***3.69***	***1.79***	***2.84***
G7									
Canada	4.90	8.66	6.20	6.39	5.58	6.28	3.80	3.57	4.25
France	5.66	4.73	5.32	6.14	6.06	6.10	4.50	2.45	3.93
Germany	4.39	5.65	4.91	4.68	8.11	6.01	4.55	5.99	5.44
Italy	5.47	6.90	5.79	8.17	6.95	7.69	7.71	4.38	6.73
Japan	6.91	7.56	7.64	10.95	15.03	13.18	9.11	8.94	9.63
UK	5.66	5.62	5.51	8.74	5.91	8.04	5.25	4.65	5.12
US	8.30	4.64	8.06	6.92	4.42	6.06	5.91	5.36	6.67
Mean	***5.90***	***6.25***	***6.21***	***7.43***	***7.44***	***7.62***	***5.83***	***5.05***	***5.97***
Std.	***1.32***	***1.51***	***1.20***	***2.05***	***3.54***	***2.59***	***1.92***	***2.07***	***1.94***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Volatility is measured by the standard deviation of the filtered series.

Table 9b
Properties of International Trade Components
(Relative Volatility: HP)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	6.82	6.33	6.64	6.74	5.66	6.51	5.33	5.69	5.06
Korea	3.76	4.27	3.59	3.17	2.38	2.86	3.52	3.54	3.43
Malaysia	2.41	2.13	2.12	2.88	3.82	3.04	2.90	2.12	2.45
Philippines	5.24	2.13	3.33	5.57	2.20	3.98	3.30	2.17	2.54
Singapore	2.50	3.79	2.40	2.39	3.40	2.37	1.29	1.28	1.18
Taiwan	3.50	-	2.99	3.65	-	3.17	3.24	-	2.99
Thailand	3.75	3.07	3.17	3.95	4.69	3.93	3.54	2.90	2.87
Mean	***4.00***	***3.62***	***3.46***	***4.05***	***3.69***	***3.69***	***3.30***	***2.95***	***2.93***
Std.	***1.56***	***1.58***	***1.49***	***1.56***	***1.34***	***1.37***	***1.19***	***1.55***	***1.17***
G7									
Canada	2.72	3.91	2.99	3.56	2.52	3.03	2.11	1.61	2.05
France	4.87	2.79	3.86	5.28	3.58	4.42	3.87	1.44	2.85
Germany	1.45	1.71	1.52	1.54	2.45	1.86	1.50	1.81	1.68
Italy	2.37	4.33	2.79	3.54	4.37	3.71	3.34	2.75	3.25
Japan	1.98	3.19	2.43	3.14	6.34	4.20	2.61	3.77	3.06
UK	3.44	2.15	2.44	5.31	2.26	3.56	3.19	1.78	2.27
US	4.08	3.47	4.13	3.40	3.31	3.11	2.91	4.01	3.42
Mean	***2.99***	***3.08***	***2.88***	***3.68***	***3.55***	***3.41***	***2.79***	***2.45***	***2.65***
Std.	***1.21***	***0.94***	***0.89***	***1.30***	***1.44***	***0.86***	***0.79***	***1.07***	***0.66***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Relative volatility is measured by the ratio of the standard deviation of the filtered series to that of filtered output.

Table 10
Properties of International Trade Components
(Contemporaneous Comovement with Output: HP)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	0.54	-0.38	0.53	-0.04	0.17	0.05	0.74	-0.59	0.63
Korea	0.20	0.32	0.22	0.11	0.24	0.11	0.11	0.22	0.14
Malaysia	0.38	0.07	0.40	0.47	0.16	0.58	-0.15	-0.23	-0.37
Philippines	0.12	0.65	0.26	0.32	0.83	0.58	-0.35	-0.21	-0.57
Singapore	0.33	0.63	0.43	0.60	0.66	0.67	-0.46	0.14	-0.46
Taiwan	0.72	-	0.64	0.82	-	0.80	-0.14	-	-0.21
Thailand	0.10	0.66	0.45	0.37	0.90	0.72	-0.30	-0.76	-0.50
Mean	***0.34***	***0.32***	***0.42***	***0.38***	***0.49***	***0.50***	***-0.08***	***-0.24***	***-0.19***
Std.	***0.23***	***0.42***	***0.14***	***0.29***	***0.34***	***0.30***	***0.40***	***0.39***	***0.43***
G7									
Canada	0.63	0.25	0.41	0.85	0.34	0.73	-0.62	0.07	-0.48
France	0.48	0.57	0.43	0.51	0.78	0.53	-0.09	-0.85	-0.25
Germany	0.25	-0.12	0.06	0.50	0.61	0.48	-0.27	-0.94	-0.47
Italy	0.42	-0.39	0.15	0.57	0.06	0.41	-0.30	-0.71	-0.34
Japan	0.07	0.34	0.05	0.17	0.47	0.18	-0.15	-0.51	-0.20
UK	0.39	0.08	0.28	0.54	0.74	0.59	-0.49	-0.84	-0.62
US	0.07	0.57	0.08	0.50	0.86	0.56	-0.48	-0.22	-0.42
Mean	***0.33***	***0.19***	***0.21***	***0.52***	***0.55***	***0.50***	***-0.34***	***-0.57***	***-0.40***
Std.	***0.21***	***0.36***	***0.16***	***0.20***	***0.28***	***0.17***	***0.19***	***0.38***	***0.15***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Contemporaneous comovement with output is measured by the correlation between the filtered series and filtered output. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 11
Properties of International Trade Components
(Persistence: HP)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	-0.12	0.05	-0.05	-0.41	0.19	-0.32	0.44	0.08	0.43
Korea	0.30	0.54	0.35	0.40	0.46	0.40	0.19	0.41	0.31
Malaysia	0.26	0.12	0.36	0.18	0.10	0.42	0.19	0.05	0.33
Philippines	-0.02	0.51	0.03	-0.01	0.26	0.24	0.17	-0.11	0.38
Singapore	0.44	0.40	0.47	0.50	0.35	0.56	0.49	0.21	0.49
Taiwan	0.40	-	0.36	0.49	-	0.48	0.49	-	0.52
Thailand	0.35	0.52	0.53	0.43	0.45	0.60	0.02	0.12	0.25
Mean	***0.23***	***0.36***	***0.29***	***0.23***	***0.30***	***0.34***	***0.28***	***0.13***	***0.39***
Std.	***0.22***	***0.22***	***0.22***	***0.34***	***0.14***	***0.31***	***0.19***	***0.17***	***0.10***
G7									
Canada	0.35	0.75	0.58	0.38	0.68	0.49	0.24	0.66	0.51
France	0.50	0.23	0.45	-0.02	0.39	0.15	0.10	0.59	0.19
Germany	0.16	0.48	0.33	0.05	0.38	0.29	0.37	0.50	0.55
Italy	0.41	0.40	0.44	0.18	-0.02	0.18	0.32	0.20	0.30
Japan	0.18	0.23	0.35	0.28	0.28	0.42	0.17	0.42	0.37
UK	0.43	0.49	0.45	0.43	0.55	0.49	0.52	0.56	0.57
US	0.58	0.58	0.65	0.29	0.62	0.31	0.29	0.62	0.56
Mean	***0.37***	***0.45***	***0.46***	***0.23***	***0.41***	***0.33***	***0.29***	***0.51***	***0.44***
Std.	***0.16***	***0.19***	***0.12***	***0.16***	***0.24***	***0.14***	***0.14***	***0.16***	***0.15***

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Persistence is measured by the first order autocorrelation coefficient of the filtered series. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 12
Properties of Inflation Rates (CPI)
(FD)

Country	Mean			Volatility			Persistence			Comovement		
	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996
Asia												
Indonesia	43.01	8.03	31.25	57.25	1.73	49.39	0.60	-0.04	0.65	-0.51	-0.08	-0.49
Korea	13.21	5.57	10.33	7.29	1.95	7.04	0.31	0.41	0.55	-0.48	-0.14	-0.32
Malaysia	3.70	3.05	3.41	3.87	1.51	3.30	0.52	0.65	0.53	0.26	0.69	0.32
Philippines	10.99	8.65	10.55	9.02	4.37	7.95	0.21	0.59	0.27	-0.60	-0.33	-0.54
Singapore	3.71	1.85	3.05	5.27	1.39	4.44	0.46	0.71	0.49	-0.03	0.55	0.07
Taiwan	-	2.93	-	-	1.44	-	-	0.61	-	-	-0.75	-
Thailand	5.71	4.38	5.21	5.82	1.40	4.84	0.56	0.70	0.58	-0.26	0.20	-0.20
Mean	***13.39***	***4.92***	***10.63***	***14.75***	***1.97***	***12.83***	***0.44***	***0.52***	***0.51***	***-0.27***	***0.02***	***-0.19***
Std.	***15.03***	***2.62***	***10.62***	***20.89***	***1.08***	***17.99***	***0.15***	***0.27***	***0.13***	***0.33***	***0.50***	***0.33***
G7												
Canada	5.67	3.14	4.85	3.35	1.74	3.11	0.87	0.58	0.86	-0.48	-0.25	-0.20
France	7.16	2.56	5.71	3.44	0.65	3.53	0.86	0.70	0.89	-0.73	0.31	-0.19
Germany	3.83	2.33	3.33	1.60	1.59	1.71	0.76	0.78	0.79	-0.41	0.16	-0.25
Italy	9.33	5.09	8.02	5.81	0.85	5.13	0.87	0.46	0.88	-0.52	0.30	-0.26
Japan	6.40	1.24	4.70	3.91	1.16	4.05	0.55	0.72	0.72	-0.33	0.22	-0.004
UK	8.20	4.36	6.96	5.26	2.28	4.79	0.76	0.66	0.79	-0.55	-0.35	-0.46
US	5.23	3.43	4.63	3.33	1.01	2.88	0.80	0.61	0.81	-0.60	-0.43	-0.50
Mean	***6.55***	***3.16***	***5.46***	***3.81***	***1.33***	***3.60***	***0.78***	***0.64***	***0.82***	***-0.52***	***-0.01***	***-0.26***
Std.	***1.86***	***1.29***	***1.58***	***1.39***	***0.57***	***1.17***	***0.11***	***0.11***	***0.06***	***0.13***	***0.33***	***0.17***

Notes: All data are logged and detrended using the FD filter. The CPI data of Korea and Taiwan start from 1963 and 1985. Mean is the average growth rate of the filtered series. Volatility is measured by the standard deviation and persistence is measured by the first order autocorrelation coefficient of the filtered series. Comovement is measured by the correlation between the filtered series and filtered output. The reported statistic of persistence and comovement for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 13
Properties of Price Level Fluctuations (CPI)
(HP)

Country	Volatility			Persistence			Comovement		
	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996
Asia									
Indonesia	55.28	1.52	45.13	0.71	0.41	0.71	-0.54	0.23	-0.51
Korea	6.80	2.03	6.58	0.39	0.54	0.66	-0.53	-0.40	-0.63
Malaysia	3.55	1.67	3.43	0.64	0.69	0.71	0.21	0.75	0.41
Philippines	7.06	4.66	7.11	0.35	0.56	0.51	-0.37	-0.51	-0.55
Singapore	5.39	1.44	4.65	0.62	0.54	0.66	-0.13	0.34	0.01
Taiwan	-	1.55	-	-	0.63	-	-	-0.88	-
Thailand	5.47	1.35	5.09	0.58	0.45	0.70	-0.26	0.11	-0.10
Mean	***13.92***	***2.03***	***12.00***	***0.55***	***0.55***	***0.66***	***-0.27***	***-0.05***	***-0.23***
Std.	***20.30***	***1.18***	***16.28***	***0.15***	***0.09***	***0.08***	***0.28***	***0.56***	***0.41***
G7									
Canada	2.30	2.07	2.55	0.68	0.76	0.81	-0.14	-0.16	-0.44
France	2.22	0.82	2.92	0.73	0.79	0.87	-0.42	0.55	-0.51
Germany	1.82	1.90	2.11	0.77	0.70	0.82	-0.12	0.32	-0.10
Italy	4.58	0.92	4.85	0.82	0.65	0.88	-0.31	0.29	-0.39
Japan	4.83	1.41	3.81	0.78	0.68	0.78	-0.46	0.26	-0.49
UK	5.26	2.72	4.65	0.78	0.72	0.83	-0.39	-0.35	-0.51
US	2.64	1.16	2.69	0.65	0.67	0.80	-0.50	-0.51	-0.60
Mean	***3.38***	***1.57***	***3.37***	***0.74***	***0.71***	***0.83***	***-0.33***	***0.06***	***-0.43***
Std.	***1.45***	***0.69***	***1.07***	***0.06***	***0.05***	***0.04***	***0.15***	***0.40***	***0.16***

Notes: All data are logged and detrended using the HP filter with the smoothing parameter set at 100. The CPI data of Korea and Taiwan start from 1963 and 1985. Volatility is measured by the standard deviation and persistence is measured by the first order autocorrelation coefficient of the filtered series. Comovement is measured by the correlation between the filtered series and filtered output. The reported statistic of persistence and comovement for the 60-96 period is significant at 5% level if it lies outside of [-0.32 , 0.32].

Table 14
Properties of Money Growth Rates
(FD)

Country	Mean			Volatility			Persistence			Comovement with Output			Comovement with CPI		
	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996
Asia															
Indonesia	9.63	13.81	11.41	17.14	6.19	13.96	0.50	0.10	0.45	0.38	0.38	0.32	-0.82	-0.50	-0.80
Korea	12.49	10.73	11.87	15.25	2.16	12.45	0.50	0.10	0.50	0.19	0.32	0.19	-0.57	-0.34	-0.39
Malaysia	10.15	11.65	10.55	6.73	7.80	6.91	-0.16	0.14	-0.06	0.41	-0.18	0.26	-0.06	0.42	0.02
Philippines	6.11	9.65	6.82	10.92	6.46	9.93	-0.22	0.36	0.10	0.52	0.58	0.52	-0.71	-0.33	-0.65
Singapore	9.87	9.52	9.60	5.65	4.28	5.13	0.21	0.07	0.19	0.48	-0.04	0.41	-0.50	-0.03	-0.39
Taiwan	15.54	-	15.23	5.73	-	5.36	0.10	-	0.11	0.29	-	0.29	-	-	-
Thailand	10.56	12.01	10.92	4.75	3.51	4.37	0.36	0.29	0.32	-0.04	0.55	0.17	-0.57	0.18	-0.49
Mean	***10.62***	***11.23***	***10.92***	***9.45***	***5.07***	***8.30***	***0.18***	***0.17***	***0.23***	***0.32***	***0.27***	***0.31***	***-0.54***	***-0.10***	***-0.45***
Std.	***2.88***	***1.62***	***2.53***	***5.05***	***2.10***	***3.83***	***0.29***	***0.12***	***0.20***	***0.20***	***0.31***	***0.12***	***0.26***	***0.35***	***0.28***
G7															
Canada	5.51	5.26	5.37	4.36	2.59	3.81	0.15	0.26	0.17	0.45	0.30	0.38	-0.14	-0.34	-0.13
France	6.73	1.80	5.06	9.21	3.22	8.03	0.06	0.50	0.17	0.21	0.25	0.31	-0.23	-0.43	-0.01
Germany	4.37	4.39	4.42	4.23	3.67	3.95	0.75	-0.32	0.47	0.65	-0.03	0.47	-0.55	0.04	-0.36
Italy	4.52	0.67	3.18	6.54	2.07	5.65	0.41	0.62	0.48	0.41	-0.05	0.45	-0.78	0.39	-0.49
Japan	7.49	4.45	6.55	5.48	3.96	5.12	0.36	0.76	0.47	0.64	0.63	0.66	-0.51	-0.22	-0.20
UK	2.21	11.19	5.04	7.21	16.86	11.52	0.33	0.21	0.33	0.45	0.57	0.44	-0.45	-0.08	-0.35
US	3.41	1.13	2.76	3.31	2.76	3.26	0.26	0.16	0.38	0.45	0.24	0.44	-0.69	-0.34	-0.47
Mean	***4.89***	***4.13***	***4.62***	***5.76***	***5.02***	***5.91***	***0.33***	***0.31***	***0.35***	***0.47***	***0.27***	***0.45***	***-0.48***	***-0.14***	***-0.29***
Std.	***1.84***	***3.60***	***1.31***	***2.04***	***5.26***	***2.94***	***0.22***	***0.36***	***0.14***	***0.15***	***0.26***	***0.11***	***0.23***	***0.28***	***0.18***

Notes: Money data are M2 series. All data are real at 1990 prices and logged and detrended using the FD filter. The M2 series of Indonesia, Singapore, Taiwan, and Italy start from 1965, 1963, 1961, and 1962, respectively. Mean is the average growth rate of the filtered series. Volatility is measured by the standard deviation and persistence is measured by the first order autocorrelation coefficient of the filtered series. Comovement with output is measured by the correlation between the filtered series and filtered output, and comovement with CPI is measured by the correlation coefficient between the filtered series and the filtered CPI. The reported statistic of persistence and comovement for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 15
Properties of Money Stock Fluctuations
(HP)

Country	Volatility			Persistence			Comovement with output			Comovement with CPI		
	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996	1960-1984	1985-1996	1960-1996
Asia												
Indonesia	17.46	5.43	14.34	0.48	0.42	0.49	0.53	0.20	0.41	-0.79	-0.62	-0.76
Korea	17.77	2.09	14.62	0.71	0.52	0.71	0.32	0.70	0.33	-0.40	-0.67	-0.40
Malaysia	5.52	7.28	6.13	0.32	0.52	0.44	0.64	0.17	0.47	0.05	0.71	0.26
Philippines	8.38	5.46	9.44	0.12	0.30	0.50	0.36	0.49	0.67	-0.79	-0.03	-0.67
Singapore	5.77	4.20	5.29	0.57	0.58	0.58	0.64	0.02	0.55	-0.53	-0.30	-0.44
Taiwan	5.46	-	5.21	0.52	-	0.53	0.31	-	0.29	-	-	-
Thailand	4.77	3.70	4.34	0.53	0.62	0.56	0.12	0.77	0.27	-0.76	0.08	-0.60
Mean	***9.30***	***4.69***	***8.48***	***0.46***	***0.49***	***0.54***	***0.42***	***0.39***	***0.43***	***-0.54***	***-0.14***	***-0.43***
Std.	***5.79***	***1.78***	***4.41***	***0.19***	***0.12***	***0.09***	***0.19***	***0.31***	***0.15***	***0.33***	***0.51***	***0.37***
G7												
Canada	3.92	2.14	3.72	0.50	0.28	0.59	0.53	0.04	0.22	0.32	-0.32	0.03
France	8.36	3.56	7.02	0.43	0.64	0.47	0.32	0.11	0.15	-0.11	-0.73	-0.06
Germany	2.74	2.64	2.98	0.62	0.12	0.58	0.53	0.49	0.56	-0.30	0.14	-0.35
Italy	4.52	2.25	4.04	0.44	0.65	0.51	0.48	0.14	0.45	-0.55	0.75	-0.62
Japan	4.96	4.95	5.02	0.55	0.78	0.65	0.64	0.78	0.67	-0.52	-0.27	-0.55
UK	7.97	16.90	12.57	0.63	0.56	0.68	0.38	0.79	0.69	-0.60	-0.02	-0.46
US	2.85	2.54	3.24	0.40	0.36	0.63	0.38	0.52	0.50	-0.79	-0.20	-0.70
Mean	***5.04***	***5.00***	***5.51***	***0.51***	***0.49***	***0.59***	***0.47***	***0.41***	***0.46***	***-0.37***	***-0.09***	***-0.39***
Std.	***2.28***	***5.34***	***3.40***	***0.09***	***0.24***	***0.08***	***0.11***	***0.31***	***0.21***	***0.37***	***0.46***	***0.28***

Notes: Money data are M2 series. All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. The M2 series of Indonesia, Singapore, Taiwan, and Italy start from 1965, 1963, 1961, and 1962, respectively. Volatility is measured by the standard deviation and persistence is measured by the first order autocorrelation coefficient of the filtered series. Comovement with output is measured by the correlation between the filtered series and filtered output, and comovement with CPI is measured by the correlation coefficient between the filtered series and the filtered CPI. The reported statistic of persistence and comovement for the 60-96 period is significant at the 5% level if it lies outside of [-0.32 , 0.32].

Table 16
Cross Country Correlations of Output Growth Rates
(FD)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.16						
Malaysia	0.41*	0.05					
Philippines	0.12	0.10	0.24				
Singapore	0.30	0.12	0.39*	0.40*			
Taiwan	0.11	0.33*	0.32*	0.28	0.23		
Thailand	0.04	0.38*	0.35*	0.29	0.34*	0.30	
Asia Cycle 1	0.32*	0.27	0.48*	0.39*	0.50*	0.43*	0.47*
Asia Cycle 2	0.33*	0.16	0.44*	0.29	0.44*	0.38*	0.51*
G7 Cycle 1	-0.14	0.38*	-0.03	0.21	0.18	0.57*	0.32*
G7 Cycle 2	-0.14	0.41*	-0.02	0.10	0.13	0.62*	0.36*

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.19						
Malaysia	0.34	0.09					
Philippines	0.03	0.01	0.04				
Singapore	0.28	0.11	0.17	0.12			
Taiwan	0.17	0.27	0.46	0.12	0.14		
Thailand	-0.07	0.46	0.18	0.28	0.21	0.36	
Asia Cycle 1	0.31	0.30	0.37	0.14	0.30	0.46	0.42
Asia Cycle 2	0.29	0.18	0.33	0.10	0.30	0.38	0.44
G7 Cycle 1	-0.08	0.37	0.05	0.13	0.18	0.59	0.53
G7 Cycle 2	-0.08	0.42	0.05	0.00	0.13	0.66	0.56

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.03						
Malaysia	0.83 (+)	-0.08					
Philippines	0.70 (+)	0.39 (+)	0.64 (+)				
Singapore	0.63 (+)	0.18 (+)	0.88 (+)	0.77 (+)			
Taiwan	-0.07	0.63 (+)	0.01	0.48 (+)	0.38 (+)		
Thailand	0.33 (+)	0.26	0.66 (+)	0.57 (+)	0.79 (+)	0.42 (+)	
Asia Cycle 1	0.62 (+)	0.28	0.70 (+)	0.83 (+)	0.89 (+)	0.41	0.72 (+)
Asia Cycle 2	0.55 (+)	0.15	0.66 (+)	0.80 (+)	0.82 (+)	0.49 (+)	0.49 (+)
G7 Cycle 1	-0.36	0.59 (+)	-0.28	0.16 (+)	-0.06	0.41	0.32
G7 Cycle 2	-0.40	0.49 (+)	-0.28	0.17 (+)	-0.08	0.40	0.55

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. The cross country correlation is measured by the correlation coefficient of the series of two countires. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) countries. The reported statistic for the 60-96 period is significant at the 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 17
Cross Country Correlations of Output Fluctuations
(HP)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.11						
Malaysia	0.53*	-0.18					
Philippines	0.37*	-0.06	0.46*				
Singapore	0.63*	0.04	0.41*	0.28			
Taiwan	0.24	0.42*	0.25	0.24	0.16		
Thailand	0.11	0.35*	0.19	0.53*	0.28	0.49*	
Asia Cycle 1	0.59*	0.12	0.46*	0.48*	0.48*	0.45*	0.52*
Asia Cycle 2	0.42*	-0.03	0.44*	0.36*	0.44*	0.52*	0.49*
G7 Cycle 1	0.00	0.51*	-0.13	-0.08	0.11	0.67*	0.39*
G7 Cycle 2	-0.19	0.49*	-0.22	-0.15	-0.10	0.66*	0.39*

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.28						
Malaysia	0.42	0.05					
Philippines	0.28	-0.07	0.14				
Singapore	0.59	0.18	0.16	-0.13			
Taiwan	0.41	0.26	0.58	0.21	0.19		
Thailand	-0.03	0.40	-0.15	0.27	0.05	0.34	
Asia Cycle 1	0.67	0.29	0.35	0.14	0.31	0.56	0.22
Asia Cycle 2	0.45	0.13	0.39	0.17	0.32	0.51	0.26
G7 Cycle 1	0.21	0.30	0.23	-0.07	0.33	0.64	0.39
G7 Cycle 2	-0.03	0.31	0.07	-0.11	0.04	0.65	0.51

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.60						
Malaysia	0.73 (+)	-0.64					
Philippines	-0.09	0.60 (+)	-0.18				
Singapore	0.11	-0.05	0.58 (+)	0.39 (+)			
Taiwan	-0.88	0.82 (+)	-0.69	0.47 (+)	0.02		
Thailand	-0.29	0.30	0.27 (+)	0.32 (+)	0.63 (+)	0.43 (+)	
Asia Cycle 1	-0.31	0.30 (+)	-0.15	0.57 (+)	0.58 (+)	0.24	0.65 (+)
Asia Cycle 2	-0.09	-0.01	-0.02	0.40 (+)	0.33 (+)	0.54 (+)	0.41 (+)
G7 Cycle 1	-0.49	0.87 (+)	-0.38	0.80 (+)	0.25	0.80 (+)	0.60 (+)
G7 Cycle 2	-0.14	0.83 (+)	-0.05	0.61 (+)	0.33 (+)	0.82 (+)	0.63 (+)

Notes: All data are real at 1990 prices and logged and detrended using the 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. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 18
Cross Country Correlations of Consumption
(HP)

1960 - 1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.34*						
Malaysia	-0.08	0.32*					
Philippines	0.01	0.12	0.27				
Singapore	-0.23	0.14	0.14	-0.10			
Taiwan	-0.20	0.21	-0.12	0.16	0.26		
Thailand	-0.17	0.32*	0.36*	0.36*	0.46*	-0.02	
Asia Cycle 1	-0.28	0.25	0.27	0.27	0.19	0.05	0.49*
Asia Cycle 2	-0.25	-0.03	0.23	0.34*	-0.26	0.04	0.29
G7 Cycle 1	-0.45*	-0.08	-0.23	-0.07	0.37*	0.44*	-0.09
G7 Cycle 2	-0.34*	-0.11	-0.43*	-0.08	0.19	0.44*	-0.17

1960 - 1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.34						
Malaysia	-0.15	0.07					
Philippines	-0.04	-0.19	-0.24				
Singapore	-0.06	0.02	0.19	-0.34			
Taiwan	-0.18	0.27	-0.11	0.27	0.03		
Thailand	-0.31	0.03	-0.08	-0.09	0.48	-0.22	
Asia Cycle 1	-0.38	-0.10	-0.10	-0.35	0.17	-0.01	-0.02
Asia Cycle 2	-0.40	-0.38	-0.43	-0.10	-0.52	0.30	-0.31
G7 Cycle 1	-0.07	-0.33	-0.25	0.09	0.23	0.48	-0.08
G7 Cycle 2	0.01	-0.24	-0.48	0.13	0.02	0.43	-0.11

1985 - 1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.37						
Malaysia	-0.19	0.85 (+)					
Philippines	-0.37	0.82 (+)	0.77 (+)				
Singapore	-0.65	-0.14	-0.11	0.07 (+)			
Taiwan	-0.16 (+)	0.02	-0.14	0.25	0.48 (+)		
Thailand	-0.11 (+)	0.80 (+)	0.83 (+)	0.60 (+)	-0.11	-0.06	
Asia Cycle 1	-0.42	0.54 (+)	0.33 (+)	0.65 (+)	-0.22	-0.02	0.62 (+)
Asia Cycle 2	-0.36	0.19 (+)	0.61 (+)	0.46 (+)	-0.61	-0.16	0.64 (+)
G7 Cycle 1	-0.86	0.28 (+)	0.09 (+)	0.32 (+)	0.67 (+)	0.36	-0.08
G7 Cycle 2	-0.82	0.14 (+)	-0.06 (+)	0.29 (+)	0.75 (+)	0.51 (+)	-0.18

Notes: All data are real at 1990 prices and logged and detrended using the 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. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 19
Cross Country Correlations of Investment
(HP)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.25						
Malaysia	0.10	-0.35*					
Philippines	-0.02	0.11	0.45*				
Singapore	0.10	-0.48*	0.73*	0.15			
Taiwan	0.20	0.23	0.13	0.30	-0.18		
Thailand	-0.05	0.51*	0.17	0.51*	0.03	0.35*	
Asia Cycle 1	0.02	-0.19	0.44*	0.42*	0.19	0.33*	0.44*
Asia Cycle 2	-0.15	-0.27	0.39*	0.11	0.21	0.31	0.51*
G7 Cycle 1	0.19	0.10	0.03	-0.10	-0.03	0.50*	0.30
G7 Cycle 2	0.03	0.14	-0.07	-0.26	-0.06	0.34*	0.16

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.33						
Malaysia	0.12	-0.64					
Philippines	-0.12	-0.01	0.03				
Singapore	0.12	-0.60	0.63	-0.30			
Taiwan	0.22	0.14	0.21	0.03	-0.19		
Thailand	-0.28	0.43	-0.43	0.08	-0.19	-0.03	
Asia Cycle 1	-0.11	-0.55	0.09	-0.18	-0.09	0.28	-0.27
Asia Cycle 2	-0.37	-0.64	0.06	-0.34	0.06	0.09	-0.23
G7 Cycle 1	0.17	-0.13	0.45	-0.29	0.44	0.52	-0.01
G7 Cycle 2	0.01	0.10	0.19	-0.35	0.19	0.45	0.14

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.76 (+)						
Malaysia	-0.05	0.22 (+)					
Philippines	0.38 (+)	0.42 (+)	0.17				
Singapore	-0.26	-0.13 (+)	0.80 (+)	-0.08 (+)			
Taiwan	0.31 (+)	0.23 (+)	-0.49	0.29 (+)	-0.57		
Thailand	0.68 (+)	0.89 (+)	0.44 (+)	0.65 (+)	0.06 (+)	0.33 (+)	
Asia Cycle 1	0.46 (+)	0.69 (+)	0.30 (+)	0.51 (+)	0.06 (+)	-0.03	0.94 (+)
Asia Cycle 2	0.63 (+)	0.84 (+)	0.27 (+)	0.50 (+)	-0.01	0.19 (+)	0.94 (+)
G7 Cycle 1	0.82 (+)	0.62 (+)	-0.25	0.61 (+)	-0.52	0.50	0.62 (+)
G7 Cycle 2	0.62 (+)	0.32 (+)	-0.27	0.63 (+)	-0.44	0.30	0.38 (+)

Notes: All data are real at 1990 prices and logged and detrended using the 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. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 20
Cross Country Correlations of Government Consumption
(HP)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.46*						
Malaysia	-0.04	-0.21					
Philippines	-0.13	0.20	0.32*				
Singapore	0.16	-0.06	-0.03	-0.53*			
Taiwan	0.21	0.27	-0.02	-0.09	-0.06		
Thailand	0.14	0.17	0.02	-0.23	0.36*	0.34*	
Asia Cycle1	0.31	0.44*	-0.01	-0.16	0.01	0.25	0.25
Asia Cycle2	0.33*	-0.04	0.10	-0.02	0.10	0.39*	0.25
G7 Cycle1	-0.17	0.03	0.22	0.11	0.04	0.30	-0.27
G7 Cycle2	-0.20	0.08	-0.09	-0.14	0.04	0.19	-0.23

1960 -1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.47						
Malaysia	-0.06	-0.24					
Philippines	-0.12	0.13	0.45				
Singapore	0.17	0.06	0.00	-0.37			
Taiwan	0.26	0.26	-0.11	-0.15	0.32		
Thailand	0.01	0.04	-0.03	-0.04	0.05	0.15	
Asia Cycle1	0.14	0.29	-0.04	-0.06	0.11	0.30	0.03
Asia Cycle2	0.31	0.00	0.00	-0.03	0.23	0.43	0.06
G7 Cycle1	-0.21	-0.05	0.29	0.33	0.16	-0.40	-0.13
G7 Cycle2	-0.26	0.07	0.01	0.04	-0.04	-0.20	-0.08

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.50 (+)						
Malaysia	0.54 (+)	-0.08 (+)					
Philippines	-0.61	-0.03	-0.29				
Singapore	0.49 (+)	-0.09	0.28 (+)	-0.22 (+)			
Taiwan	0.62 (+)	0.69 (+)	-0.02 (+)	-0.61	-0.14		
Thailand	0.67 (+)	-0.23	0.45 (+)	-0.66	0.74 (+)	0.16 (+)	
Asia Cycle1	0.93 (+)	0.43 (+)	0.30 (+)	-0.71	0.32 (+)	0.12	0.41 (+)
Asia Cycle2	0.86 (+)	0.15 (+)	0.41 (+)	-0.54	0.50 (+)	0.48 (+)	0.36 (+)
G7 Cycle1	0.49 (+)	0.74 (+)	0.02	-0.41	-0.08	0.82 (+)	-0.06 (+)
G7 Cycle2	0.24 (+)	0.73 (+)	-0.04	-0.18	-0.27	0.66 (+)	-0.37

Notes: All data are real at 1990 prices and logged and detrended using the 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. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 21
Cross Country Correlation of Exports
(HP)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.10						
Malaysia	0.36*	0.03					
Philippines	0.28	-0.32	0.26				
Singapore	0.39*	0.05	0.71*	0.21			
Taiwan	0.33*	0.10	0.02	-0.16	0.04		
Thailand	0.30	0.23	0.49*	0.09	0.48*	0.18	
Asia Cycle 1	0.45*	-0.06	0.57*	0.12	0.55*	0.18	0.51*
Asia Cycle 2	0.24	-0.12	0.50*	0.06	0.43*	0.18	0.39*
G7 Cycle 1	0.35*	0.16	0.59*	0.19	0.56*	-0.14	0.19
G7 Cycle 2	0.52*	0.14	0.79*	0.28	0.68*	-0.05	0.53*

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.00						
Malaysia	0.28	0.13					
Philippines	0.28	-0.42	0.24				
Singapore	0.37	0.08	0.65	0.13			
Taiwan	0.39	0.03	0.04	-0.18	0.08		
Thailand	0.27	0.36	0.37	0.10	0.45	0.15	
Asia Cycle 1	0.50	-0.03	0.51	0.07	0.49	0.19	0.50
Asia Cycle 2	0.31	-0.06	0.48	0.01	0.37	0.17	0.40
G7 Cycle 1	0.46	0.32	0.73	0.15	0.65	0.06	0.42
G7 Cycle 2	0.52	0.34	0.78	0.23	0.69	0.08	0.54

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.39						
Malaysia	0.41 (+)	-0.11					
Philippines	-0.46	0.67 (+)	0.09				
Singapore	0.22	0.38 (+)	0.76 (+)	0.53 (+)			
Taiwan	-0.22	0.98 (+)	-0.34	0.66 (+)	0.15 (+)		
Thailand	0.50 (+)	0.04	0.62 (+)	-0.01	0.64 (+)	0.19 (+)	
Asia Cycle 1	0.00	0.32 (+)	0.44	0.37 (+)	0.81 (+)	0.42 (+)	0.52 (+)
Asia Cycle 2	-0.20	-0.04 (+)	0.31	0.49 (+)	0.75 (+)	0.71 (+)	0.30
G7 Cycle 1	-0.07	-0.08	0.36	0.42 (+)	0.40	-0.87	-0.18
G7 Cycle 2	0.36	-0.24	0.53	0.34 (+)	0.54	-0.71	0.29

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Export data for Indonesia starts from 1962 and export data for Taiwan ends in 1990. The cross country correlation is measured by the correlation coefficient of the series of two countries. Asian (G7) cycle 1 is constructed rom average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 22
Cross Country Correlations of Imports
(HP)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.34*						
Malaysia	0.09	0.19					
Philippines	-0.14	0.14	0.69*				
Singapore	0.21	0.47*	0.62*	0.39*			
Taiwan	0.40*	0.18	0.07	-0.24	0.46*		
Thailand	0.16	0.30	0.55*	0.46*	0.52*	0.34*	
Asia Cycle 1	0.20	0.44*	0.57*	0.24	0.65*	0.33*	0.57*
Asia Cycle 2	0.07	0.22	0.69*	0.33*	0.56*	0.05	0.48*
G7 Cycle 1	0.26	0.53*	0.45*	0.23	0.57*	0.28	0.43*
G7 Cycle 2	0.26	0.57*	0.40*	0.23	0.58*	0.35*	0.49*

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.33						
Malaysia	-0.03	0.17					
Philippines	-0.26	0.06	0.62				
Singapore	0.17	0.51	0.49	0.21			
Taiwan	0.40	0.18	-0.18	-0.46	0.38		
Thailand	0.10	0.40	0.18	0.34	0.33	0.13	
Asia Cycle 1	0.14	0.50	0.33	-0.02	0.54	0.21	0.40
Asia Cycle 2	-0.03	0.18	0.59	0.14	0.44	-0.11	0.39
G7 Cycle 1	0.26	0.57	0.45	0.15	0.62	0.31	0.42
G7 Cycle 2	0.25	0.60	0.38	0.13	0.62	0.36	0.51

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.38 (+)						
Malaysia	0.34 (+)	-0.13					
Philippines	0.05 (+)	0.30 (+)	0.42				
Singapore	0.07	0.12	0.62 (+)	0.67 (+)			
Taiwan	-0.60	0.15	0.03 (+)	0.01 (+)	0.60 (+)		
Thailand	0.49 (+)	-0.11	0.83 (+)	0.45 (+)	0.78 (+)	0.28 (+)	
Asia Cycle 1	0.36 (+)	0.08	0.67 (+)	0.53 (+)	0.78 (+)	0.18	0.81 (+)
Asia Cycle 2	0.56 (+)	0.09	0.49	0.50 (+)	0.58 (+)	0.11 (+)	0.43 (+)
G7 Cycle 1	0.38 (+)	0.45	0.42	0.57 (+)	0.49	0.03	0.51 (+)
G7 Cycle 2	0.42 (+)	0.55	0.37	0.70 (+)	0.53	0.03	0.51 (+)

Notes: All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. Import data for Indonesia starts from 1962 and import data for Taiwan ends in 1990. The cross country correlation is measured by the correlation coefficient of the series of two countries. Asian (G7) cycle 1 is constructed rom average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 23
Cross Country Correlations of Money Stock
(HP)

1960-1996	**Indonesia**	**Korea**	**Malaysia**	**Philippines**	**Singapore**	**Taiwan**	**Thailand**
Korea	-0.39*						
Malaysia	0.39*	-0.22					
Philippines	-0.28	0.15	0.01				
Singapore	-0.04	0.49*	-0.19	0.24			
Taiwan	0.23	-0.40*	-0.02	-0.20	-0.56*		
Thailand	0.09	0.48*	-0.23	0.08	0.44*	0.06	
Asia Cycle1	-0.16	-0.05	0.01	-0.04	0.30	-0.31	0.46*
Asia Cycle2	-0.42*	0.06	0.04	-0.05	0.48*	-0.28	0.51*
G7 Cycle1	0.19	0.11	-0.29	-0.07	0.26	0.34*	0.23
G7 Cycle2	0.25	0.06	-0.28	-0.18	0.16	0.47*	0.345*

1960-1984	**Indonesia**	**Korea**	**Malaysia**	**Philippines**	**Singapore**	**Taiwan**	**Thailand**
Korea	-0.44						
Malaysia	0.71	-0.23					
Philippines	-0.34	0.24	-0.18				
Singapore	-0.15	0.54	0.04	0.32			
Taiwan	0.27	-0.46	0.05	-0.01	-0.60		
Thailand	-0.02	0.53	-0.12	0.22	0.36	0.10	
Asia Cycle1	-0.18	-0.05	0.20	0.01	0.32	-0.27	0.51
Asia Cycle2	-0.45	0.06	0.17	-0.03	0.50	-0.29	0.55
G7 Cycle1	0.12	0.04	0.13	0.16	0.11	0.36	0.20
G7 Cycle2	0.22	-0.02	0.13	0.16	0.07	0.49	0.43

1985-1996	**Indonesia**	**Korea**	**Malaysia**	**Philippines**	**Singapore**	**Taiwan**	**Thailand**
Korea	-0.11 (+)						
Malaysia	-0.40	-0.60					
Philippines	0.20 (+)	0.12	0.03 (+)				
Singapore	0.59 (+)	0.40	-0.77	-0.35			
Taiwan	-0.86	0.61 (+)	-0.03	-0.41	-0.22 (+)		
Thailand	0.69 (+)	-0.09	-0.46	-0.24	0.73 (+)	-0.76	
Asia Cycle1	0.24 (+)	-0.21	-0.71	-0.23	-0.17	-0.75	0.10
Asia Cycle2	0.40 (+)	-0.24	-0.68	0.14 (+)	0.49	-0.57	0.42
G7 Cycle1	0.15 (+)	0.82 (+)	-0.73	-0.07	0.67 (+)	0.25	0.19
G7 Cycle2	0.24 (+)	0.82 (+)	-0.70	-0.08	0.66 (+)	0.25	0.18

Notes: Money data are M2 series. All data are real at 1990 prices and logged and detrended using the HP filter with the smoothing parameter set at 100. The M2 series of Indonesia, Singapore, Taiwan, amd Italy start from 1965, 1963, 1961, and 1962, respectively. The cross country correlation is measured by the correlation coefficient of the series of two countries. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 24
Cross Country Correlations of Price Levels (CPI)
(HP)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.01						
Malaysia	-0.10	0.41*					
Philippines	-0.27	-0.11	0.39*				
Singapore	-0.10	0.33*	0.93*	0.44*			
Taiwan	-	-	-	-	-		
Thailand	-0.07	0.62*	0.85*	0.14	0.85*	-	
Asia Cycle1	-0.17	0.11	0.20	-0.18	0.17	-	0.17
Asia Cycle2	-0.22	0.06	0.11	-0.26	0.06	-	0.16
G7 Cycle1	-0.14	0.72*	0.76*	0.23	0.65*	-	0.79*
G7 Cycle2	-0.13	0.80*	0.72*	0.16	0.62*	-	0.82*

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.02						
Malaysia	-0.13	0.20					
Philippines	-0.35	-0.14	0.51				
Singapore	-0.11	0.20	0.95	0.54			
Taiwan	-	-	-	-	-		
Thailand	-0.08	0.48	0.82	0.22	0.84	-	
Asia Cycle1	-0.21	0.05	0.13	-0.25	0.13	-	0.11
Asia Cycle2	-0.27	0.04	0.07	-0.35	0.02	-	0.13
G7 Cycle1	-0.18	0.64	0.73	0.18	0.64	-	0.78
G7 Cycle2	-0.18	0.73	0.67	0.13	0.59	-	0.79

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.04 (+)						
Malaysia	0.58 (+)	0.43 (+)					
Philippines	0.06 (+)	0.97 (+)	0.52 (+)				
Singapore	0.42 (+)	0.86 (+)	0.74	0.90 (+)			
Taiwan	0.37	0.69	0.88	0.77	0.91		
Thailand	0.06 (+)	0.67 (+)	0.71	0.78 (+)	0.79	0.84	
Asia Cycle1	0.23 (+)	0.84 (+)	0.71 (+)	0.83 (+)	0.98 (+)	0.90	0.81(+)
Asia Cycle2	0.14 (+)	0.76 (+)	0.64 (+)	0.94 (+)	0.97 (+)	0.86	0.74 (+)
G7 Cycle1	-0.38	0.79 (+)	-0.13	0.75 (+)	0.47	0.25	0.32
G7 Cycle2	-0.29	0.84 (+)	-0.04	0.81 (+)	0.57	0.35	0.38

Notes: All data are logged and detrended using the HP filter with the smoothing parameter set at 100. The CPI data of Korea and Taiwan start from 1963 and 1985. The cross country correlation is measured by the correlation coefficient of the series of two countries. Asian (G7) cycle 1 is constructed from average growht rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 25
Summary of Cross Country Correlations

A. Summary of Correlations

1960-1996	Plus Sign	Minus Sign	Significant Stats.
Output (FD)	21	0	8
Output (HP)	19	2	9
Consumption	15	6	6
Investment	15	6	7
Gov. consumption	11	10	5
Exports	18	3	6
Imports	19	2	11
Money	11	10	7

B. Change in Correlation Coefficients

1985-1996	Plus Sign	Minus Sign	Total
Output (FD)	16	5	21
Output (HP)	10	11	21
Consumption	10	11	21
Investment	16	5	21
Gov. consumption	13	8	21
Exports	12	9	21
Imports	14	7	21
Money	8	13	21

C. Summary of Correlations with the Measures of Asian Business Cycles

	1960-1996		Change from 60-84 to 85-96		Number of Significant Statistics (60-96)	
	Plus Sign w/ AC1	Plus Sign w/ AC2	Plus Sign w/ AC1	Plus Sign w/ AC2	w/ AC1	w/ AC2
Output (FD)	7	7	5	6	6	5
Output (HP)	7	7	4	4	6	6
Consumption	6	4	4	4	1	1
Investment	6	5	6	6	4	2
Gov. consumption	5	5	5	6	1	2
Exports	6	6	5	4	4	3
Imports	7	7	5	5	5	4
Money	3	4	1	2	1	3

Notes: This table presents a summary of the information presented in tables 16-24. Panel A presents the number of positive correlation coefficients (plus sign), the number of negative correlation coefficients (negative sign) across the Asian countries,and the number of the statistically significant correlations. The plus (minus) sign in panel B represents the number of cross coutry correlations which increase (decrease) in the 1985-1996 period. Panel C presents the number of positive correlation coefficients (plus sign w/), the number of correlation coefficients which increase in the 1985-1996 period (change from 60-84 to 85-96), and the number of statistically significant correlations (number of significant statistics) between macroeconomic variables of Asian countries and Asian business cycles.

Table A1
Properties of National Expenditure Components
(Volatility: FD)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	4.56	5.70	5.00	33.14	8.16	27.22	28.72	6.28	23.60
Korea	2.82	1.75	2.52	13.26	6.20	11.34	9.45	2.61	7.86
Malaysia	4.83	4.97	4.76	10.90	12.41	11.47	9.70	5.11	8.41
Philippines	2.55	1.63	2.43	11.75	9.95	13.54	8.09	5.32	7.38
Singapore	3.86	2.22	3.50	12.47	8.22	12.84	6.33	5.95	7.23
Taiwan	2.12	4.20	2.92	10.68	9.82	10.41	4.25	9.80	6.49
Thailand	2.81	2.15	2.70	6.18	8.77	7.21	5.65	5.15	5.43
Mean	***3.36***	***3.23***	***3.41***	***14.05***	***9.08***	***13.43***	***10.31***	***5.75***	***9.49***
Std.	***1.05***	***1.68***	***1.07***	***8.72***	***1.93***	***6.41***	***8.36***	***2.14***	***6.30***
G7									
Canada	1.81	1.78	1.95	6.10	6.46	6.23	3.41	2.00	3.42
France	1.72	1.01	1.72	4.89	5.15	4.97	2.65	1.21	2.81
Germany	3.04	4.83	3.59	7.48	7.30	7.29	4.54	5.54	4.77
Italy	3.17	1.56	2.90	7.59	5.51	7.06	4.18	3.01	4.09
Japan	3.27	1.20	3.04	7.94	4.95	7.03	3.77	0.87	3.58
UK	2.14	2.62	2.27	5.71	8.60	6.55	2.87	1.17	2.52
US	2.62	1.32	2.26	7.33	5.59	6.77	2.58	1.48	2.44
Mean	***2.54***	***2.05***	***2.53***	***6.72***	***6.22***	***6.56***	***3.43***	***2.18***	***3.38***
Std.	***0.65***	***1.34***	***0.67***	***1.15***	***1.33***	***0.78***	***0.77***	***1.64***	***0.86***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Volatility is measured by the standard deviation of the filtered series.

Table A2
Properties of National Expenditure Components
(Relative Volatility: FD)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	1.39	6.01	1.78	10.10	8.61	9.69	8.75	6.62	8.40
Korea	0.81	0.82	0.83	3.83	2.91	3.72	2.73	1.22	2.58
Malaysia	1.43	2.07	1.43	3.22	5.15	3.44	2.86	2.13	2.52
Philippines	0.85	0.72	0.72	3.93	4.40	4.00	2.71	2.35	2.18
Singapore	1.09	0.92	0.98	3.53	3.39	3.59	1.79	2.45	2.02
Taiwan	0.77	1.92	1.13	3.88	4.50	4.01	1.54	4.49	2.50
Thailand	1.31	0.96	1.17	2.89	3.94	3.13	2.64	2.32	2.36
Mean	***1.09***	***1.92***	***1.15***	***4.48***	***4.70***	***4.51***	***3.29***	***3.08***	***3.22***
Std.	***0.28***	***1.88***	***0.36***	***2.51***	***1.88***	***2.30***	***2.46***	***1.84***	***2.29***
G7									
Canada	0.79	0.89	0.82	2.68	3.24	2.62	1.50	1.00	1.43
France	0.90	0.63	0.88	2.56	3.25	2.53	1.39	0.76	1.43
Germany	0.82	1.39	1.02	2.03	2.10	2.06	1.23	1.60	1.35
Italy	1.05	1.07	1.04	2.50	3.80	2.52	1.38	2.08	1.46
Japan	0.78	0.63	0.80	1.90	2.60	1.85	0.90	0.46	0.94
UK	1.02	1.17	1.08	2.71	3.85	3.12	1.36	0.52	1.20
US	1.10	0.98	1.08	3.09	4.16	3.24	1.09	1.10	1.17
Mean	***0.92***	***0.97***	***0.96***	***2.50***	***3.29***	***2.56***	***1.26***	***1.07***	***1.28***
Std.	***0.13***	***0.28***	***0.12***	***0.41***	***0.73***	***0.51***	***0.21***	***0.59***	***0.19***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Relative volatility is the ratio of the standard deviation of the filtered series to that of filtered output.

Table A3
Properties of National Expenditure Components
(Contemporaneous Comovement with Output: FD)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	0.04	0.37	0.14	0.45	0.08	0.42	0.51	0.48	0.48
Korea	0.38	-0.12	0.32	0.39	0.56	0.42	-0.12	-0.15	-0.11
Malaysia	0.42	0.76	0.49	0.58	0.82	0.66	0.15	-0.08	0.12
Philippines	0.45	0.53	0.57	0.73	0.61	0.80	0.74	0.95	0.64
Singapore	0.70	0.43	0.66	0.15	0.40	0.34	0.45	0.03	0.09
Taiwan	0.83	0.29	0.52	0.63	0.85	0.69	0.18	0.14	0.13
Thailand	0.45	0.52	0.52	0.51	0.90	0.68	0.27	-0.13	0.07
Mean	***0.47***	***0.40***	***0.46***	***0.49***	***0.60***	***0.57***	***0.31***	***0.18***	***0.20***
Std.	***0.25***	***0.27***	***0.17***	***0.19***	***0.29***	***0.18***	***0.28***	***0.40***	***0.26***
G7									
Canada	0.78	0.56	0.75	0.74	0.90	0.78	-0.06	-0.55	0.11
France	0.67	0.84	0.76	0.89	0.93	0.89	0.35	-0.51	0.42
Germany	0.93	0.93	0.90	0.85	0.99	0.89	0.65	0.87	0.70
Italy	0.86	0.87	0.88	0.69	0.89	0.73	0.21	0.35	0.35
Japan	0.88	0.87	0.89	0.94	0.96	0.91	0.55	0.19	0.60
UK	0.85	0.90	0.86	0.76	0.92	0.81	-0.16	-0.09	-0.16
US	0.64	0.93	0.67	0.85	0.79	0.84	0.29	0.06	0.30
Mean	***0.80***	***0.84***	***0.82***	***0.82***	***0.91***	***0.84***	***0.26***	***0.05***	***0.33***
Std.	***0.11***	***0.13***	***0.09***	***0.09***	***0.06***	***0.07***	***0.32***	***0.50***	***0.29***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Contemporaneous comovement with output is measured by the correlation between the filtered series and filtered output. The report statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32, 0.32].

Table A4
Properties of National Expenditure Components
(Persistence: FD)

Country	Consumption			Investment			Government Consumption		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	-0.14	-0.10	-0.09	-0.13	-0.17	-0.13	0.04	0.08	0.04
Korea	0.12	0.47	0.20	0.23	0.38	0.25	0.34	-0.02	0.33
Malaysia	-0.17	0.40	0.04	0.36	0.40	0.46	-0.14	-0.38	-0.14
Philippines	0.08	0.24	0.24	0.13	0.06	0.39	0.26	0.54	0.31
Singapore	0.26	0.37	0.26	0.62	0.55	0.68	0.29	0.32	0.20
Taiwan	0.13	0.42	0.32	-0.09	0.29	0.04	-0.18	0.19	0.09
Thailand	-0.22	-0.01	-0.01	0.23	0.47	0.42	0.28	0.61	0.37
Mean	***0.01***	***0.25***	***0.14***	***0.19***	***0.29***	***0.30***	***0.13***	***0.19***	***0.17***
Std.	***0.18***	***0.22***	***0.16***	***0.26***	***0.25***	***0.27***	***0.22***	***0.34***	***0.19***
G7									
Canada	0.09	0.54	0.38	0.34	0.45	0.40	0.45	0.29	0.57
France	0.27	0.33	0.46	0.53	0.62	0.57	0.21	0.23	0.52
Germany	0.60	0.08	0.34	0.52	0.25	0.46	0.60	0.13	0.42
Italy	0.24	0.00	0.31	0.24	0.21	0.28	0.04	0.29	0.23
Japan	0.00	0.56	0.22	0.26	0.65	0.33	0.39	-0.09	0.54
UK	0.23	0.62	0.38	0.17	0.65	0.42	0.34	0.13	0.35
US	-0.22	0.22	-0.15	0.14	0.43	0.22	0.12	0.50	0.29
Mean	***0.17***	***0.34***	***0.28***	***0.31***	***0.46***	***0.38***	***0.31***	***0.21***	***0.42***
Std.	***0.25***	***0.25***	***0.20***	***0.16***	***0.18***	***0.12***	***0.20***	***0.18***	***0.13***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Persistence is measured by the first order autocorrelation of the filtered series. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32, 0.32].

Table A5
Properties of International Trade Components
(Volatility: FD)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	33.60	8.71	27.54	36.87	7.32	29.82	19.13	7.56	15.90
Korea	15.81	8.87	14.60	11.88	5.46	10.39	14.87	7.96	13.23
Malaysia	9.70	6.35	9.09	11.51	11.43	11.75	11.13	6.54	9.74
Philippines	21.35	5.48	17.75	22.17	7.16	19.09	12.05	9.44	11.12
Singapore	13.00	7.77	11.43	11.43	7.23	10.24	6.16	2.95	5.29
Taiwan	10.82	-	10.68	10.12	-	9.82	8.65	-	8.35
Thailand	8.79	6.97	8.45	8.64	11.41	9.67	10.06	8.17	9.36
Mean	***16.15***	***7.36***	***14.22***	***16.09***	***8.33***	***14.40***	***11.72***	***7.10***	***10.43***
Std.	***8.81***	***1.34***	***6.71***	***10.17***	***2.49***	***7.57***	***4.25***	***2.24***	***3.43***
G7									
Canada	5.87	7.29	6.19	7.53	5.02	6.69	4.88	3.39	4.42
France	6.14	5.81	6.19	9.10	6.96	8.68	6.19	2.33	5.23
Germany	6.02	6.01	6.20	6.69	9.19	7.57	5.30	5.84	5.40
Italy	6.64	7.84	6.99	11.02	9.62	10.62	9.34	5.62	8.26
Japan	9.03	8.87	9.46	13.61	17.66	14.82	11.87	9.68	11.08
UK	6.46	6.00	6.18	9.66	5.93	8.46	5.28	4.62	5.01
US	8.35	4.63	7.40	8.64	4.08	7.50	7.09	5.10	6.60
Mean	***6.93***	***6.64***	***6.94***	***9.47***	***8.35***	***9.19***	***6.57***	***5.23***	***6.57***
Std.	***1.25***	***1.44***	***1.21***	***2.31***	***4.59***	***2.78***	***2.36***	***2.33***	***2.36***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Volatility is measured by the standard deviation of the filtered series.

Table A6
Properties of International Trade Components
(Relative Volatility: FD)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	10.24	9.18	9.81	11.24	7.72	10.62	5.83	7.97	5.66
Korea	4.57	4.17	4.79	3.43	2.56	3.41	4.30	3.74	4.34
Malaysia	2.87	2.64	2.73	3.40	4.75	3.52	3.29	2.72	2.92
Philippines	7.15	2.42	5.24	7.42	3.16	5.64	4.03	4.17	3.28
Singapore	3.68	3.20	3.20	3.24	2.98	2.87	1.74	1.22	1.48
Taiwan	3.93	-	4.12	3.68	-	3.79	3.14	-	3.22
Thailand	4.11	3.13	3.67	4.04	5.13	4.20	4.70	3.67	4.07
Mean	***5.22***	***4.12***	***4.79***	***5.21***	***4.38***	***4.86***	***3.86***	***3.91***	***3.57***
Std.	***2.59***	***2.55***	***2.38***	***3.04***	***1.93***	***2.68***	***1.30***	***2.25***	***1.30***
G7									
Canada	2.57	3.66	2.60	3.30	2.52	2.81	2.14	1.70	1.85
France	3.22	3.67	3.16	4.77	4.39	4.43	3.25	1.47	2.67
Germany	1.63	1.73	1.76	1.81	2.65	2.14	1.44	1.68	1.53
Italy	2.19	5.41	2.50	3.64	6.64	3.79	3.08	3.88	2.95
Japan	2.16	4.66	2.49	3.26	9.28	3.90	2.84	5.09	2.92
UK	3.07	2.69	2.94	4.59	2.65	4.03	2.51	2.07	2.39
US	3.52	3.44	3.54	3.64	3.04	3.59	2.98	3.80	3.16
Mean	***2.62***	***3.61***	***2.71***	***3.57***	***4.45***	***3.53***	***2.61***	***2.81***	***2.50***
Std.	***0.68***	***1.21***	***0.57***	***0.98***	***2.59***	***0.79***	***0.64***	***1.42***	***0.61***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and and import data for Taiwan end in 1990. Relative volatility is measured by the ratio of the standard deviation of the filtered series to that of filtered output.

Table A7
Properties of International Trade Components
(Contemporaneous Comovement with Output: FD)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	0.34	-0.21	0.33	0.02	0.25	0.05	0.56	-0.11	0.49
Korea	0.19	0.50	0.22	0.14	0.37	0.18	0.08	0.22	0.10
Malaysia	0.59	0.32	0.57	0.54	0.31	0.53	-0.04	-0.38	-0.11
Philippines	-0.09	0.53	0.05	0.09	0.59	0.25	-0.33	-0.48	-0.34
Singapore	0.44	0.77	0.49	0.55	0.79	0.60	-0.09	-0.13	-0.11
Taiwan	0.66	-	0.63	0.75	-	0.74	-0.06	-	-0.06
Thailand	-0.05	0.62	0.21	0.11	0.89	0.46	-0.14	-0.71	-0.29
Mean	***0.30***	***0.42***	***0.36***	***0.32***	***0.53***	***0.40***	***0.00***	***-0.27***	***-0.05***
Std.	***0.29***	***0.34***	***0.21***	***0.29***	***0.26***	***0.25***	***0.28***	***0.33***	***0.28***
G7									
Canada	0.63	0.38	0.52	0.80	0.50	0.69	-0.49	-0.07	-0.30
France	0.34	0.57	0.48	0.49	0.67	0.58	-0.38	-0.54	-0.40
Germany	0.41	0.05	0.26	0.56	0.61	0.53	-0.25	-0.88	-0.45
Italy	0.49	-0.15	0.39	0.71	0.27	0.65	-0.49	-0.64	-0.51
Japan	-0.04	0.36	0.16	0.22	0.43	0.28	-0.28	-0.34	-0.23
UK	0.39	0.09	0.30	0.52	0.64	0.52	-0.48	-0.61	-0.52
US	0.16	0.42	0.17	0.49	0.80	0.53	-0.41	-0.29	-0.41
Mean	***0.34***	***0.25***	***0.32***	***0.54***	***0.56***	***0.54***	***-0.39***	***-0.48***	***-0.40***
Std.	***0.22***	***0.26***	***0.14***	***0.19***	***0.18***	***0.13***	***0.10***	***0.27***	***0.10***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Contemporaneous comovement with output is measured by the correlation between the filtered series and filtered output. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32, 0.32].

Table A8
Properties of National Expenditure and International Trade Components
(Comovement with Output: FD)

1960-1996	Consumption			Investment			Government Consumption			Exports			Imports			Net Exports		
	j=-1	j=0	j=1	j=-1	j=0	j=1	j=-1	j=0	j=1	j=-1	j=0	j=1	j=-1	j=0	j=1	j=-1	j=0	j=1
Asia																		
Indonesia	-0.07	0.10	**0.20**	**0.61**	0.59	0.28	**0.50**	0.45	0.07	0.37	**0.53**	0.33	0.04	**0.05**	-0.02	0.44	**0.63**	0.45
Korea	-0.02	**0.38**	0.44	0.15	**0.45**	0.35	0.24	0.23	**0.36**	**0.25**	0.22	0.00	-0.06	**0.11**	0.10	**0.31**	0.14	-0.09
Malaysia	0.44	**0.69**	0.58	0.62	**0.83**	0.66	0.28	0.42	**0.44**	0.28	**0.40**	0.00	0.44	**0.58**	0.27	-0.30	**-0.37**	-0.35
Philippines	0.57	**0.77**	0.72	0.57	**0.88**	0.76	**0.83**	0.82	0.42	0.26	**0.26**	0.26	0.47	**0.58**	0.53	-0.40	**-0.57**	-0.48
Singapore	0.53	**0.68**	0.42	0.18	0.48	**0.69**	0.14	0.28	**0.41**	0.31	**0.43**	0.14	0.54	**0.67**	0.37	**-0.46**	-0.46	-0.44
Taiwan	0.37	**0.62**	0.43	0.14	**0.76**	0.73	0.17	**0.23**	0.13	0.61	**0.64**	0.01	0.39	**0.80**	0.52	0.20	-0.21	**-0.55**
Thailand	0.35	**0.70**	0.69	0.60	**0.83**	0.65	-0.16	0.14	**0.39**	**0.52**	0.45	0.24	0.61	**0.72**	0.54	-0.27	**-0.50**	-0.47
Mean	***0.31***	***0.56***	***0.50***	***0.41***	***0.69***	***0.59***	***0.29***	***0.37***	***0.32***	***0.37***	***0.42***	***0.14***	***0.35***	***0.50***	***0.33***	***-0.07***	***-0.19***	***-0.27***
Std.	***0.26***	***0.24***	***0.18***	***0.24***	***0.18***	***0.19***	***0.31***	***0.23***	***0.15***	***0.14***	***0.14***	***0.14***	***0.26***	***0.30***	***0.22***	***0.37***	***0.43***	***0.35***
G7																		
Canada	0.63	**0.78**	0.43	0.30	**0.81**	0.74	-0.25	**-0.35**	-0.01	0.27	**0.41**	0.06	0.40	**0.73**	0.34	-0.21	**-0.48**	-0.42
France	0.25	**0.51**	0.32	0.54	**0.90**	0.73	-0.08	0.00	**0.14**	0.02	**0.43**	0.46	0.01	**0.53**	0.42	0.01	**-0.25**	-0.04
Germany	0.43	**0.90**	0.62	0.64	**0.88**	0.43	0.20	0.73	**0.75**	0.02	0.06	**-0.07**	0.34	**0.48**	0.02	-0.36	**-0.47**	-0.09
Italy	0.44	**0.83**	0.32	-0.15	0.60	**0.65**	0.21	**0.25**	0.21	0.19	0.15	**-0.19**	-0.23	**0.41**	0.13	**0.42**	-0.34	-0.31
Japan	0.31	**0.83**	0.37	0.54	**0.93**	0.56	-0.17	0.29	**0.39**	-0.07	0.05	**0.22**	-0.05	**0.18**	0.16	0.02	**-0.20**	-0.05
UK	0.62	**0.92**	0.62	0.45	**0.89**	0.80	**-0.17**	-0.12	0.12	0.14	**0.28**	0.11	0.32	**0.59**	0.39	-0.35	**-0.62**	-0.49
US	0.50	**0.78**	0.32	0.41	**0.77**	0.27	0.18	0.36	**0.46**	**-0.40**	0.08	0.39	0.02	**0.56**	0.45	**-0.51**	-0.42	0.07
Mean	***0.46***	***0.79***	***0.43***	***0.39***	***0.83***	***0.60***	***-0.01***	***0.17***	***0.30***	***0.02***	***0.21***	***0.14***	***0.12***	***0.50***	***0.27***	***-0.14***	***-0.40***	***-0.19***
Std.	***0.14***	***0.13***	***0.14***	***0.26***	***0.12***	***0.19***	***0.20***	***0.35***	***0.26***	***0.22***	***0.16***	***0.24***	***0.24***	***0.17***	***0.17***	***0.32***	***0.15***	***0.21***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Net exports are detrened series of real exports minus detrended series of real imports. Exports and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Comovement with output is measured by the correlation between the filtered series and filtered output. The bold statistic indicates the largest value of the correlation in absolute term. The reported statistic is significant at 5% level if it lies outside of [-0.32 , 0.32].

Table A9
Properties of International Trade Components
(Persistence : FD)

Country	Exports			Imports			Net Exports		
	60-84	85-96	60-96	60-84	85-96	60-96	60-84	85-96	60-96
Asia									
Indonesia	-0.62	-0.51	-0.58	-0.63	-0.12	-0.60	-0.07	-0.11	-0.07
Korea	0.09	0.48	0.22	0.13	0.31	0.17	-0.03	0.44	0.07
Malaysia	-0.04	-0.20	0.05	-0.19	-0.32	-0.07	-0.18	-0.15	-0.17
Philippines	-0.37	0.17	-0.35	-0.34	-0.17	-0.22	-0.10	0.14	-0.04
Singapore	0.09	0.13	0.10	0.12	-0.001	0.16	0.13	-0.06	0.13
Taiwan	0.16	-	0.21	0.20	-	0.21	0.20	-	0.24
Thailand	-0.17	0.32	0.04	-0.09	0.11	0.14	-0.46	0.21	-0.27
Mean	***-0.12***	***0.06***	***-0.04***	***-0.11***	***-0.03***	***-0.03***	***-0.07***	***0.08***	***-0.02***
Std.	***0.28***	***0.36***	***0.30***	***0.30***	***0.22***	***0.30***	***0.22***	***0.23***	***0.18***
G7									
Canada	0.18	0.62	0.34	0.13	0.49	0.20	-0.26	0.57	-0.09
France	0.05	0.23	0.17	-0.38	0.21	-0.15	-0.29	0.14	-0.24
Germany	-0.20	0.37	0.05	-0.13	0.27	0.06	0.06	0.37	0.18
Italy	-0.09	0.18	0.04	-0.19	-0.13	-0.12	-0.06	-0.23	-0.08
Japan	-0.17	0.51	0.11	-0.04	0.42	0.15	-0.17	0.46	-0.01
UK	-0.02	0.19	0.02	0.03	0.37	0.07	0.18	0.06	0.15
US	0.35	0.30	0.35	-0.16	0.35	-0.12	-0.04	0.45	0.11
Mean	***0.01***	***0.34***	***0.15***	***-0.11***	***0.28***	***0.01***	***-0.08***	***0.26***	***0.00***
Std.	***0.20***	***0.17***	***0.14***	***0.16***	***0.21***	***0.14***	***0.17***	***0.28***	***0.15***

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. Net exports are detrended series of real exports minus detrended series of real imports. Export and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Persistence is measured by the first order autocorrelation coefficient of the filtered series. The reported statistic for the 60-96 period is significant at the 5% level if it lies outside of [-0.32, 0.32].

Table A10
Cross Country Correlation of Consumption
(FD)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan
Korea	-0.23					
Malaysia	-0.02	0.25				
Philippines	0.04	0.13	0.05			
Singapore	-0.07	-0.13	0.07	-0.13		
Taiwan	0.01	0.21	-0.11	0.16	0.18	
Thailand	-0.20	0.21	0.37	-0.07	0.45	0.10

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan
Korea	-0.35					
Malaysia	-0.11	0.10				
Philippines	0.02	0.04	-0.18			
Singapore	-0.09	-0.19	0.09	-0.26		
Taiwan	-0.08	0.27	-0.33	0.11	0.04	
Thailand	-0.44	0.06	0.28	-0.29	0.46	-0.04

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan
Korea	-0.10					
Malaysia	0.09	0.72				
Philippines	0.20	0.68	0.67			
Singapore	-0.10	0.06	0.02	0.40		
Taiwan	0.06	0.17	0.10	0.27	0.45	
Thailand	0.16	0.71	0.57	0.63	0.38	0.27

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. The cross country correlation is measured by the correlation coefficient of the series of the two countries.

Table A11
Cross Country Correlation of Investment
(FD)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.42						
Malaysia	-0.01	-0.20					
Philippines	0.18	-0.03	0.28				
Singapore	-0.13	-0.11	0.49	0.20			
Taiwan	0.09	0.11	0.12	0.25	0.14		
Thailand	-0.08	0.32	0.21	0.29	0.12	0.21	
Asia Cycle 1	-0.10	-0.27	0.26	0.42	0.14	0.30	0.28
Asia Cycle 2	-0.16	-0.23	0.06	0.13	0.15	0.28	0.40
G7 Cycle 1	0.01	0.20	0.07	-0.04	0.35	0.41	0.31
G7 Cycle 2	-0.11	0.28	-0.04	-0.19	0.25	0.33	0.20

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	-0.47						
Malaysia	-0.01	-0.37					
Philippines	0.27	-0.17	0.13				
Singapore	-0.17	-0.22	0.44	-0.06			
Taiwan	0.10	0.10	0.21	0.10	0.07		
Thailand	-0.16	0.23	-0.14	0.03	0.06	0.15	
Asia Cycle 1	-0.18	-0.49	0.09	0.25	-0.09	0.28	-0.03
Asia Cycle 2	-0.25	-0.39	-0.15	-0.002	-0.05	0.24	0.25
G7 Cycle 1	-0.05	0.15	0.15	-0.18	0.47	0.46	0.29
G7 Cycle 2	-0.14	0.29	-0.05	-0.43	0.24	0.37	0.25

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
Korea	0.39						
Malaysia	-0.09	0.34					
Philippines	-0.05	0.31	0.46				
Singapore	-0.05	0.10	0.72	0.57			
Taiwan	0.07	0.15	-0.09	0.45	0.11		
Thailand	0.31	0.80	0.64	0.58	0.40	0.38	
Asia Cycle 1	0.07	0.50	0.53	0.65	0.57	0.28	0.82
Asia Cycle 2	0.20	0.65	0.51	0.42	0.41	0.27	0.90
G7 Cycle 1	0.67	0.38	-0.12	0.11	-0.27	0.21	0.44
G7 Cycle 2	0.43	0.08	-0.11	0.22	-0.14	0.05	0.25

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. The cross country correlation is measured by the correlation coefficient of the series of two countries. Asian (G7) cycle 1 is constructed from average growth rates of a series of all Asian (G7) countries. Asian (G7) cycle 2 is constructed from weighted average growth rates of a series of all the Asian (G7) countries, where the weights are proportional to the ratio of of GDP of an Asian (a G7) country to the sum of GDP of all the Asian (G7) 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 A12
Cross Country Correlation of Government Consumption
(FD)

1960-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan
Korea	0.15					
Malaysia	0.07	0.00				
Philippines	-0.13	0.17	0.30			
Singapore	0.01	0.04	0.14	-0.09		
Taiwan	0.16	0.13	-0.06	-0.22	0.02	
Thailand	0.04	0.12	0.01	-0.14	0.41	0.32

1960-1984	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan
Korea	0.14					
Malaysia	0.06	0.02				
Philippines	-0.12	0.18	0.40			
Singapore	-0.05	0.11	0.20	0.07		
Taiwan	0.20	0.09	0.01	-0.08	0.27	
Thailand	0.00	0.17	-0.05	-0.01	0.36	0.46

1985-1996	Indonesia	Korea	Malaysia	Philippines	Singapore	Taiwan
Korea	0.46					
Malaysia	0.37	-0.05				
Philippines	-0.53	-0.07	-0.01			
Singapore	0.52	-0.04	-0.11	-0.32		
Taiwan	0.41	0.51	-0.21	-0.55	-0.12	
Thailand	0.57	-0.02	0.14	-0.45	0.44	0.29

Notes: All data are real at 1990 prices and logged and detrended using the FD filter. The cross country correlation is measured by the correlation coefficient of the series of two countries.

Table B
Properties of National Expenditure and International Trade Components
(BP)

1960-1996	Volatility							Persistence							Comovement with Output					
	Y	C	I	G	X	M	NX	Y	C	I	G	X	M	NX	C	I	G	X	M	NX
Asia																				
Indonesia	1.27	2.43	11.69	9.14	13.75	16.21	9.61	0.13	-0.17	0.01	-0.25	-0.33	-0.34	-0.08	-0.06	0.35	0.13	0.29	-0.05	0.51
Korea	1.76	1.57	7.47	4.59	7.44	6.43	7.87	0.09	0.10	0.26	0.32	0.20	0.17	0.12	0.16	0.52	-0.20	0.18	0.14	0.06
Malaysia	1.95	2.93	6.98	5.23	5.27	7.02	5.85	0.18	0.14	0.45	0.01	-0.03	0.02	-0.06	0.53	0.70	0.13	0.46	0.48	-0.15
Philippines	1.97	1.32	8.47	4.65	10.54	11.18	6.82	0.48	0.20	0.36	0.34	-0.25	-0.12	0.10	0.48	0.80	0.69	0.01	0.29	-0.45
Singapore	2.14	1.99	5.62	4.12	6.51	5.85	3.32	0.31	0.16	0.54	0.21	0.05	0.13	0.17	0.75	0.46	-0.01	0.55	0.59	0.04
Taiwan	1.60	2.05	5.95	3.94	5.67	4.85	4.83	0.25	0.26	-0.02	0.02	0.18	0.11	0.19	0.53	0.65	0.11	0.71	0.84	-0.02
Thailand	1.32	1.54	4.31	3.31	4.82	5.88	5.65	0.34	0.00	0.38	0.39	0.15	0.22	-0.05	0.48	0.68	-0.02	0.13	0.41	-0.32
Mean	***1.72***	***1.98***	***7.21***	***5.00***	***7.72***	***8.20***	***6.28***	***0.25***	***0.10***	***0.28***	***0.15***	***0.00***	***0.03***	***0.05***	***0.41***	***0.60***	***0.12***	***0.33***	***0.39***	***-0.05***
Std.	***0.33***	***0.56***	***2.39***	***1.93***	***3.28***	***4.08***	***2.06***	***0.13***	***0.14***	***0.21***	***0.23***	***0.21***	***0.20***	***0.11***	***0.27***	***0.16***	***0.28***	***0.25***	***0.30***	***0.31***
G7																				
Canada	1.24	0.96	3.73	1.33	3.94	4.46	2.51	0.26	0.28	0.41	0.44	0.32	0.27	-0.08	0.70	0.74	-0.50	0.69	0.80	-0.33
France	0.80	0.70	2.37	1.30	3.65	4.93	3.06	0.22	-0.04	0.35	0.22	0.06	-0.17	-0.13	0.45	0.83	-0.07	0.56	0.60	-0.30
Germany	2.00	2.06	4.61	2.62	3.76	5.03	3.57	0.28	0.23	0.42	0.24	0.01	0.09	0.25	0.89	0.90	0.62	0.20	0.58	-0.61
Italy	1.40	1.61	4.20	2.05	3.66	6.23	5.29	0.08	0.14	0.14	0.03	0.01	-0.08	-0.02	0.86	0.70	0.12	0.26	0.72	-0.67
Japan	1.94	1.56	3.78	1.59	5.68	9.42	6.63	0.11	-0.02	0.27	0.25	0.10	0.22	0.21	0.86	0.91	0.49	-0.01	0.24	-0.34
UK	1.38	1.49	4.18	1.57	3.68	5.39	3.24	0.34	0.38	0.38	0.32	0.03	0.12	0.21	0.89	0.81	-0.35	0.36	0.59	-0.58
US	1.33	1.39	4.54	1.19	4.86	4.46	4.12	0.28	-0.06	0.28	0.11	0.33	-0.05	0.22	0.70	0.90	0.11	0.16	0.63	-0.49
Mean	***1.44***	***1.40***	***3.91***	***1.67***	***4.18***	***5.70***	***4.06***	***0.22***	***0.13***	***0.32***	***0.23***	***0.12***	***0.06***	***0.10***	***0.77***	***0.83***	***0.06***	***0.32***	***0.59***	***-0.47***
Std.	***0.41***	***0.45***	***0.76***	***0.51***	***0.79***	***1.75***	***1.44***	***0.10***	***0.17***	***0.10***	***0.13***	***0.14***	***0.16***	***0.16***	***0.16***	***0.08***	***0.41***	***0.24***	***0.18***	***0.15***

Notes: All data are real at 1990 prices and logged and detrended using the BP filter. Net exports are detrened series of real exports minus detrended series of real imports. Exports and import data for Indonesia start from 1962, and export and import data for Taiwan end in 1990. Volatility is measured by the standard deviation of the filtered series. Persistence is measured by the first order autocorrelation of the filtered series. Comovement with output is measured by the correlation between the filtered series and filtered output. The reported statistic for persistence or comovement with output is significant at the 5% level if it lies outside of [-0.32 , 0.32].