

# Is Asian Integration Sheltering the Region from the Crisis?

Final Report

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## List of Acronyms and Abbreviations

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ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
ASEAN+3	ASEAN plus China, Japan and Korea
ASEAN-4	Indonesia, Malaysia, Philippines, and Thailand
ASEAN-5	Indonesia, Malaysia, Philippines, Singapore and Thailand
ASEM	Asia-Europe Meeting
BCSA	Bilateral currency swap arrangement
BI	Bank Indonesia
ECM	Error-correction mechanism
EU	European Union
FDI	Foreign direct investment
Forex	Foreign exchange
IMF	International Monetary Fund
LDCs	Least Developed Countries
NIEs	Newly Industrialized Economies
REER	Real Effective Exchange Rates
RMB	Renminbi (yuan)
SMEs	Small and medium size enterprises
TNCs	Transnational corporations
US	United States

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## EXECUTIVE SUMMARY

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The success of developing Asia's outward-looking export-oriented growth strategy in the last 25 years has helped to engender a large and persistent global imbalance whereby Asia accounts for the bulk of the current account surplus and the United States accounts for most of that deficit. This situation has produced a mutual dependence in which the United States depends on Asia to finance its external deficit, and Asia depends on the United States to help drive demand for its exports. Whether or not the global imbalance has been the root cause of, or at least contributed to, the current financial crisis, there is widespread concern about the sustainability of the global imbalance. For Asia, one way to resolve this situation over the long run involves shifting the region's growth drivers from an outward orientation to domestic and intraregional demand absorption as a means of sustaining the region's rapid output expansion. Whether that shift can occur is closely associated with the issue of whether Asia can decouple from the United States, as well as other extra-regional markets like that of the European Union.

Proponents of the decoupling view argue that the Asian economies now have more diversified export markets; they also point to more robust domestic and intra-regional growth drivers that are independent of the US and other developed economies. China in particular has the potential to drive that intra-regional growth, a phenomenon that has already been exemplified by the emergence of its large trade and investments with East and Southeast Asia. There are, nonetheless, a large number of opponents to this view. Those who argue that decoupling is unlikely to occur point to the fact that intra-regional and extra-regional trade flows in Asia are largely made up of parts and components that eventually supply the United States and other developed economies. Reversing that pattern in Asia, they argue, would be neither feasible nor desirable.

The present study examines the empirical evidence underlying these arguments as a means of establishing some forward looking views about what options are available to the Asian economies. First, it demonstrates that the strong linkages both within Asia and between Asia and the United States and Europe have not waned in the last 25 years. However, the transmission channels have become more complex as new sources of spillovers arise in terms of portfolio flows, stock market co-movements, and integrated production networks. As a consequence, it is unlikely that Asia's business-cycle synchronization with the US and European economies will diminish in the near to medium term.

Second, the study finds that there are significant downside risks for the recovery of growth in the United States and Europe. Over the medium term, US and EU consumer spending is expected to be sluggish relative to economies like China, where earlier high savings rates are expected to decline as the government introduces stimulus packages centered on expenditure growth. If Asia leads the recovery, with China at its center, the policy focus should be on mechanisms to shift trade as well as investment from slow growth markets to the more dynamic economies. That shift could support a structural change in Asia's trading patterns over the medium term.

Thirdly, the types of goods produced in Asia as outsourcing for large multinational enterprises is likely to increasingly incorporate more technology-intensive processes that could help shift existing subcontracting arrangements from those with affiliates and parent companies based in the United States and the European Union to Asia-centric ones that rely on intra-regional production networks. Nonetheless, multinationals will probably continue to be dominated by US, EU and, to a lesser extent, Japanese firms, since it is unlikely that, as a group, the shares of these top-ranked companies will significantly erode. For the Asian countries to develop their

own cross-national production networks and compete in the global market they will need to implement more aggressive domestic investment and technological development programs. One effective channel that has been successfully pursued by some countries is to encourage investment by foreign transnationals as a means of attracting technology and production know-how. Another has been the implementation of sub-regional cooperation schemes aimed at developing scale economies and private capital investment of the magnitude needed for effective competition at the global level. However, schemes like the ASEAN Investment Area (AIA) have had limited success because of the large number of exceptions that create disincentives for its use by private investors. Moreover, while shorter distance between Asian countries facilitates bilateral FDI flows, equally important are low sovereign risk, a transparent and predictable regulatory environment and small corporate tax rates in the host countries, and so are these factors have deterred cross-border investments in many Asia countries.

Another finding of the study is that stock market indicators in Asia are highly correlated with the major financial centers in the United States and Europe. Some studies have suggested that, for the Asian emerging markets in particular, the existence of co-movements has given rise to contagion, which occurs when there are significant increases in co-movements after a shock to a country. However, the existence of significant increases in stock market co-movements in the emerging markets of Asia has been found lacking following the stock market collapse in September 2008. There is also evidence that the large inflows of portfolio capital into developing Asia prior to the recent global financial crisis are not only associated with economic fundamentals in those countries, but also with the demand conditions in the stock markets of the major international financial centers. The latter finding suggests that financial policies of the industrialized countries are as likely to affect portfolio capital inflows into Asia as are the economic fundamentals within those Asian countries. These findings generally point to the likely continuation of close relationship between developments in Asia's stock markets and those in the major international financial centers.

Finally, it is likely that pegged and managed exchange rates will continue to form part of the policy tools used in most Asian economies, notwithstanding the lessons from the 1997 Asian crisis. The resulting appreciation of some currencies in terms of their real effective exchange rates relative to other Asian economies and major US and European markets could push policymakers to adopt the types of exchange rate policies that were introduced after the Asian financial crisis, but have since then been abandoned by most countries. Otherwise, continued management of exchange rates could negatively impact on competitive adjustments, which could, in turn, undermine the recovery of the global economy.

A number of forward looking policy implications can be derived from these findings. First, the current downturn in economic activity throughout Asia highlights the inherent unsustainability of an economic growth model dependent on foreign demand. This situation has given rise to widespread suggestions by policymakers in the Asian economies to take concrete actions to rebalance their economies in a way that will ensure a more stable growth path in the medium to long run. Yet the fundamental question facing those policymakers is how to rebalance in a way that reduces the region's dependence on the continued global imbalance. Policies promoting greater domestic consumption are generally favored over those encouraging investment since Asia's widening current account surplus has been driven by high savings rates. Moreover, there is stronger evidence of over-saving than under-investment in the region, and stronger evidence of over-investment prior to the 1997 Asian crisis than under-investment after the Asian crisis. This phenomenon suggests that the key to rebalancing Asian growth toward domestic sources lies in promoting consumption rather than investment.

There is also considerable scope for deepening trade liberalization within the ASEAN countries and broadening the coverage to other Asian countries as a means of strengthening the so-

called 'domestic' regional economy. A larger regional bloc would promote scale economies and specialization in differentiated products that would help to expand intra-industry trade. Progress in moving from a free trade area to a customs union in ASEAN could also yield substantial producer and consumer welfare benefits to the region. The resulting expansion in production and domestic demand in individual Asian economies would stimulate cross-border production activities to target the increased demand for final goods and thereby increase the relative importance of final goods in intraregional trade. In addition to the progress being made among the ASEAN+3 countries, there is also growing interest in expanding trade between Southeast Asia and South Asia.

Finally, there are opportunities for countries to adopt more flexible exchange rate regimes that would help Asian countries to promote a rebalancing based on the reallocation of resources from production of tradables to non-tradables. The prescription could become all the more appropriate if a further US dollar depreciation occurred. In that case, many Asian currencies would likely experience a significant nominal and real exchange rate appreciation. Lower relative prices would help to shift resources toward production for domestic use, raise household incomes and stimulate consumption. Although in the short run it is unlikely that policymakers will embrace these expenditure switching measures that shift demand between domestic goods and imports, it could become a long-term strategy in the context of rebalancing growth towards domestic sources.

# I. INTRODUCTION

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## A. Background

Asia's exceptional success in developing an outward-looking export-oriented growth strategy has been largely driven by a dynamic global trade expansion lasting well over 25 years. However, that process has also created a global imbalance in which Asia now accounts for the bulk of the current account surplus and the United States accounts for most of that deficit. The result has been a mutual dependence whereby the United States relies on Asia to finance its external deficit, and Asia depends on the United States to help drive the demand for its exports.

While the imbalance has enabled the global market to absorb the expansion of global supplies resulting from China and India's entry into the world economy, there have been suggestions that the so-called global savings glut contributed to the current global financial crisis.<sup>1</sup> The argument is that the shift in GDP from the lower-saving industrialized countries to the higher-saving developing countries has raised the global supply of savings, suppressed long-term real interest rates and caused the current account deficits in the industrialized countries.<sup>2</sup> That process has been exacerbated by easy monetary policy, particularly in the United States, and unregulated financial innovations. Financing of that deficit was made possible by high savings rates in China and emerging Asian countries.

Opponents of this view, however, argue that that crisis was caused by regulatory failures rather than economic policies encouraging excessive consumption in the United States and in some of the other advanced countries. Those regulatory failures originated from the ineffective supervision and regulation of financial markets, driven by ill-conceived policy choices. The remedy to the present situation, they argue, lies in the elimination of systemic risks through the application of prudential regulations in the form of a stricter legal framework for the financial system. Indeed, proponents of this view believe that attacking the present international trade and financial system would only lead to a metastasis of the present crisis in the global financial system into a broader and longer-lasting global financial crisis.<sup>3</sup>

Whether or not the global imbalance was the root cause of, or at least contributed to, the current financial crisis, there still remains widespread concern about its sustainability. A new Asian growth strategy could possibly remedy the situation by rebalancing the region's growth towards domestic and intraregional demand-driven absorption of the region's continued rapid output expansion. If such a shift is to occur, then it raises the question about whether Asia can decouple from the United States as well as other extra-regional markets like that of the European Union. Proponents of the decoupling view argue that Asian economies now have more diversified export markets; they also point to more robust domestic and intra-regional

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<sup>1</sup> The hypothesis has been put forward by the present Chairman of the US Federal Reserve, Ben Bernanke in "The Global Saving Glut and the U.S. Current Account Deficit", Sandridge Lecture, Virginia Association of Economics, Richmond, Virginia, Federal Reserve Board, March 2005.

<sup>2</sup> Often-cited evidence is the fact that China's national savings rate was 54 percent in 2007, while that of the United States has been near zero.

<sup>3</sup> See, for example, M.P. Dooley, D. Folkerts-Landau, and P.M. Garber, "Bretton Woods II Still Defines the International Monetary System". National Bureau of Economic Research. NBER Working Paper No. 14731, February 2009; and M.P. Dooley and P. Garber, Global imbalances and the crisis: A solution in search of a problem". VoxEU.org, 21 March 2009.

growth drivers that are independent of the US and other developed economies.<sup>4</sup> They argue that China, with a consumer market of 1.3 billion, has the potential to drive that intra-regional growth, a phenomenon that has already been exemplified by the emergence of the country's large trade and investments with East and Southeast Asia.

There are, nonetheless, many opponents to this view. Those who argue that decoupling is unlikely to occur in the future point to the fact that intra-regional and extra-regional trade flows in Asia are largely made up of parts and components that eventually supply the United States and other developed economies. Reversing that pattern in Asia would be neither feasible nor desirable. For decoupling to occur in the medium to long-term, Asia would need to fundamentally diversify its export markets and shift a significant portion of its production to domestic markets. While the share of Asia's exports to the G3 (US, EU and Japan) has indeed been on the decline in recent years, the United States remains one of the largest export markets for most Asian economies. And while Asia's trade appears to have diversified into other intra-regional and extra-regional markets, the fact remains that much of that trade is in the form of intermediate goods that are processed within the region for export to large markets like those of the United States and Europe. For that reason, a recent study by the Monetary Authority of Singapore concludes that there is little likelihood of structural decoupling in the long run.<sup>5</sup> Similarly, the ADB's *Asian Development Outlook* report for 2007 stated that, "Despite the emergence of the PRC economy and the increase in the Asian region's share in global production and trade, [the evidence indicates] that the rise in intra-Asian economic interdependence through investment and trade is being *driven* by the globalization process."<sup>6</sup> A subsequent study by the ADB underscores the importance of Asia's global links and concludes that Asia's intra-regional and extra-regional relationships have reinforced each other since the recent surge in intraregional trade in parts and components has been largely driven by global final goods exports.<sup>7</sup>

## **B. Coverage and Delimitations of the Study**

The present study examines the empirical evidence underlying these arguments as a means of establishing some forward looking views about what options are available to the Asian economies. The paper is structured as follows: After this introductory section, Section II discusses the Asian growth model and the international transmission of business cycles. The first part of that section sets out the major views about sources of growth and the new globalization process. The second part addresses that globalization process in the context of

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<sup>4</sup> Representatives of this view include M.A. Kose, C. Otrok, E.S. Prasad, "Global Business Cycles: Convergence or Decoupling?" NBER Working Paper No. 14292, October 2008. They found that, for the globalization period of 1985-2005, there was evidence of business cycle convergence within the group of industrial economies and among the group of emerging market economies, but divergence (or decoupling) between these two groups. Prior to the current global financial crisis, the International Monetary Fund (IMF) viewed developing Asia's decoupling as a growing possibility in light of the region's declining share of exports to the United States and countercyclical monetary and fiscal policies in some countries (see International Monetary Fund, "World Economic Outlook: Asia and Pacific. Spillovers and Cycles in the Global Economy". Washington, DC, April 2007). Since the start of the global crisis, however, the IMF has characterized the current situation as reflecting the growing spillover effects from the United States to Asia, that is, while the spillovers from the United States to Asia have been modest, they have increased over time (see International Monetary Fund, "Regional Economic Outlook: Asia and Pacific". Washington, DC, April 2008; and International Monetary Fund, "Regional Economic Outlook: Asia and Pacific". Washington, DC, May 2009).

<sup>5</sup> Monetary Authority of Singapore, "Revisiting the US-Asia Decoupling Hypothesis". Special Feature B. Economic Policy Department. Macroeconomic Review, October 2007.

<sup>6</sup> Asian Development Bank, "Asian Development Outlook 2007". Manila, 2007.

<sup>7</sup> Asian Development Bank, "Emerging Asian Regionalism: A Partnership for Shared Prosperity". Manila, 2008.

business cycle synchronizations within Asia and between Asia and the United States and Europe. It covers both the degree and magnitude of those transmissions and the dynamics underlying their transmissions to the Asian economies.

Section III addresses the issue of Asia's decoupling in the context of spillovers sources, namely, trade linkages, financial channels, and commodity prices. Based on the empirical findings, the final part of the section examines the prospect for Asia's decoupling from the United States and the European Union in terms of trade and financial channels that include foreign direct investment (FDI), portfolio flows and use of international currency linkages affecting the region's international competitiveness. Section IV examines the policy implications of the findings in terms of Asia's growth model, the possibility of inward looking market shifts, changes in trade and investment policy, including exchange rate regimes, and a possible new international financial architecture.

The country coverage of this report consists of members of the Asia-Europe Meeting (ASEM), comprising the 13 members of ASEAN Plus Three (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam, plus China, Japan, and South Korea), India, Mongolia and Pakistan.

## II. LINKAGES TO THE US AND EU ECONOMIES IN THE ASIAN GROWTH MODEL

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### A. Sources of Asian Growth

#### 1. Main Sources of Growth

There are two widely recognized explanations of economic growth in Asia. The first focuses on supply growth in the region to explain the 'Asian Miracle' associated with capital accumulation, the absorption or assimilation of increasingly modern technology and the change in industrial structures.<sup>8</sup> Whether driven by capital accumulation or by its productive assimilation, the growth process was accompanied by major changes in the structure of the East Asian economies.<sup>9</sup> Notwithstanding the severe economic and financial crisis that hit all the countries in late 1997 and 1998, the view holds that the factors determining supply growth are largely intact and will undoubtedly continue to influence the region under a favorable policy environment.

A closely related but more recent explanation is the view that structural factors have explained the long-term growth of the Southeast Asian economies. It emphasizes the region's outward-oriented activities as the dominant factors in the region's growth, which has been supported by high domestic savings, human capital development, sound macro management and limited price distortions combined with careful policy interventions. Until the recent global financial crisis, the systemic changes in the world economy have generated large volumes of international capital inflows and transactions in goods and services for the region, as well as generating a widespread diffusion of production, transportation, and communication technologies from corporate contracting arrangements. The introduction of new technologies through cross-border production networks and the dissemination of new skills in the workforce have become as important to the specialization of production activities in the Asian economies as their capital, labor and natural resource endowments.

This globalization process emphasizes demand-led growth and the policy environment as a critical determinant of Asia's growth. Until about the mid-1980s many of the region's countries relied on exports as the main engine for economic growth, which implied a liberalization of trade and an emphasis on the facilitating role of the government. The shift from an export-driven growth strategy by many Asian countries to a growth strategy targeting global production and market networks was largely driven by efforts to exploit the worldwide growth of cross-border production and international capital movements. While the earlier outward-oriented strategy promoted economic growth in a number of Asian economies through the introduction of high value-added products into their economies, the new strategy has targeted the broad-based transmission of domestic learning and knowledge accumulation as a means of sustaining high economic growth rates.

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<sup>8</sup> See Kim, J.I. and L.J. Lau, "The Sources of Economic Growth in the East Asian Newly Industrialized Countries". *Journal of Japanese and International Economics*. 8: 235-71, 1994; Stiglitz, J., "The Role of International Financial Institutions in the Current Global Economy". Address to the Chicago Council on Foreign Relations. Chicago (27 February), 1997; World Bank, *The Asian Miracle: Economic Growth and Public Policy*. Oxford: Oxford University Press for the World Bank, 1993; and Young, A., "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience". *Quarterly Journal of Economics*. 110: 641-680, 1995.

<sup>9</sup> Nelson, R.R., and H. Pack (), "The Asian Miracle and Modern Growth Theory". *Economic Journal* 109, July, 1999.

## B. Globalization and Synchronization of Business Cycles

### 1. Synchronization in the Global Economy

Asia's growing openness of economies and increasing globalization of production processes have contributed to the international transmission of business cycles. Recent studies suggest that the industrialized countries of North America and Western Europe are synchronizing their business cycles because of key macroeconomic and financial variable linkages. Claessens, Kose, and Terrones (2008), for example, found that one-half of the industrialized countries experienced a synchronization of their recessions in the 1990s and early 2000s. Another recent study by Kose, Otrok and Prasad (2008) showed that the coincidences of those cycles have been much greater when investment changes generate those movements than when they were caused by consumption changes. In Asia, however, Hong, Lee, and Tang (2009) found that, with the exception of the 1997 Asian financial crisis, there has generally been less synchronization of business cycles than in the industrialized countries.

#### 1.1. Synchronization of Business Cycles in Asia

Before analyzing linkages between Asia and the US and EU economies, we need to examine whether economic downturns and expansionary movements have coincided among the Asian economies themselves. If there has been synchronization of those movements within the region, then we can make generalizations about movements in key macroeconomic and financial variables for Asia as a whole relative to global shocks originating in the United States and the European Union. Otherwise, it will be necessary to approach the issue of dependency linkages for the Asian countries from a more disaggregated point of view.

Table 2.1 shows the average correlation coefficient between pairs of Asian countries. The analysis is based on annual time series data for 1980-2008 from the IMF *World Economic Outlook* database (April 2009). The average for all countries is 0.8, but it is higher for the ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore and Thailand) at 0.93 than for the other ASEAN member countries (0.89).<sup>10</sup> The "Plus 3" members of ASEAN (China, Japan and Korea) have a correlation coefficient of 0.75 between their economic activity and that of all ASEM member countries, although China's correlation with ASEAN member countries is high (0.94). Among the new members of ASEM (India, Mongolia and Pakistan), the correlation coefficient between their economic activity and that of ASEM countries is relatively high for India and Pakistan (both 0.89), but it is low for Mongolia (0.3). By way of comparison, the correlation coefficient between economic activity in the United States and the European Union is 0.998. Notwithstanding the relatively high correlation

**Table 2.1: Correlation between Economic Activities of ASEM Member Countries, 1980-2008**

	ASEAN	China, Japan, Korea	India, Mongolia, Pakistan	All ASEM
Brunei	<b>0.94</b>	0.79	0.81	0.88
Cambodia	<b>0.95</b>	0.83	0.78	0.89
Indonesia	<b>0.93</b>	0.83	0.76	0.88
Lao PDR	<b>0.93</b>	0.78	0.78	0.87
Malaysia	<b>0.94</b>	0.87	0.74	0.89
Myanmar	0.76	0.57	0.78	0.73
Philippines	<b>0.93</b>	0.86	0.74	0.88
Singapore	<b>0.91</b>	0.89	0.69	0.87
Thailand	<b>0.90</b>	0.89	0.68	0.85
Vietnam	0.85	0.66	0.76	0.80
China	<b>0.94</b>	0.69	0.79	0.88
Japan	0.62	0.71	0.36	0.58
South Korea	0.83	0.82	0.60	0.78
India	<b>0.94</b>	0.83	0.70	0.89
Mongolia	0.37	0.06	0.35	0.30
Pakistan	<b>0.95</b>	0.87	0.63	0.89

Note: Economic activity is measured by real GDP.  
Source of data: IMF, World Economic Outlook (WEO) database, April 2009.

<sup>10</sup> Correlations of 0.9 or more are highlighted in bold.

coefficients, they are subject to the usual limitations of this type of analysis: the coefficient of correlation only measures the linear relationship between the two variables; it assumes that the data has a normal distribution (in other words, neither set of data is independently skewed); and it assumes a consistent scatter pattern over the whole range (the homoscedascity assumption). In addition, use of annual frequency data obscures movements within each period and therefore represents broad averages of the occurrences.

## 1.2. Synchronization of Asia and US/EU Business Cycles

The absence of a strong cross-country linkage of business cycles, except for the ASEAN members, China and India, suggests the need for caution in making generalizations, and it points to the need to examine business cycle synchronizations at the country level. Table 2.2 reports the correlation coefficients between ASEM member countries and the United States and European Union, both concurrently and with a one-period lead by the United States and European Union.<sup>11</sup> The results support the existence of a same-period synchronization of business cycles, with relatively weaker linkages for Brunei Darussalam, Myanmar and Mongolia. It is not surprising to find that Asia's synchronization of business cycles are equally strong for the United States as for the European Union since the correlation coefficient between economic activity in the United States and the European Union is near unity. Of course, we need to be careful about making predictions from these results, since the existence of past business cycle correlations does not necessarily imply future synchronizations, especially when the underlying causes of those international business cycle co-movement differ greatly among Asian countries.<sup>12</sup>

We also tested the extent of Asia's business cycle synchronization with the United States and the European Union over time. The results show that business cycle movements coincide as much in the current decade as they did in the 1990s.<sup>13</sup> The extent of synchronization was somewhat lower in the 1990s because of the 1997 Asian crisis, whose spread to the United States and Western Europe was limited to a mini-crash in the stock market.

**Table 2.2: Correlation between Economic Activity of ASEM Member Countries and US/EU, 1980-2008**

	US	EU	US + EU	US (+1)	EU (+1)	US + EU (+1)
Brunei	0.80	0.78	0.79	0.81	0.80	0.80
Cambodia	<b>0.97</b>	<b>0.98</b>	<b>0.98</b>	0.96	0.97	0.96
Indonesia	0.97	0.97	0.97	0.97	0.97	0.97
Lao PDR	<b>0.97</b>	<b>0.97</b>	<b>0.97</b>	0.96	0.96	0.96
Malaysia	<b>0.99</b>	<b>0.99</b>	<b>0.99</b>	0.98	0.98	0.98
Myanmar	0.88	0.90	0.89	0.86	0.87	0.87
Philippines	<b>0.95</b>	<b>0.96</b>	<b>0.96</b>	0.94	0.95	0.94
Singapore	<b>0.99</b>	0.99	0.99	0.98	0.99	0.99
Thailand	<b>0.98</b>	<b>0.98</b>	<b>0.98</b>	0.97	0.97	0.97
Vietnam	<b>0.97</b>	<b>0.97</b>	<b>0.97</b>	0.96	0.96	0.96
China	<b>0.95</b>	<b>0.96</b>	<b>0.95</b>	0.94	0.94	0.94
Japan	0.94	0.94	0.94	<b>0.95</b>	0.94	<b>0.95</b>
Korea	0.99	0.99	1.00	0.99	0.99	0.99
India	<b>0.96</b>	<b>0.97</b>	<b>0.97</b>	0.95	0.95	0.95
Mongolia	0.86	0.88	0.87	0.83	0.85	0.84
Pakistan	<b>0.98</b>	<b>0.99</b>	<b>0.98</b>	0.97	0.97	0.97
<b>ASEAN</b>	<b>0.99</b>	<b>0.99</b>	<b>0.99</b>	0.98	0.98	0.98
<b>ASEAN+3</b>	<b>0.99</b>	<b>0.99</b>	<b>0.99</b>	0.98	0.99	0.99
<b>ASEM</b>	0.99	0.99	0.99	0.99	0.99	0.99

Note 1: Economic activity is measured by real GDP.

Note 2: (+1) refers to one-period ahead GDP of corresponding country (US and/or EU).

Source of data: IMF, World Economic Outlook (WEO) database, April 2009.

<sup>11</sup> In comparing concurrent and one-period leads of US and EU business cycles, higher ASEM member country correlations are highlighted in bold.

<sup>12</sup> See, in particular, M.A. Kose, C. Otrok and E. Prasad (2008), who used a dynamic factor model to examine comovements of business cycles using a number of macroeconomic variables rather than just aggregate output. Based on this more disaggregated approach, they found no evidence of global convergence of business cycles during the recent period of globalization.

<sup>13</sup> The correlation coefficient between the ASEM region and US+EU is 0.99 in both the 1990s and 2000s.

### 1.3. Magnitude of Business Cycle Transmissions

The consequences of US and EU business cycle spillovers on the Asia economies are particularly noticeable during downturns. Nonetheless, there has been considerable variation in the extent to which US and EU economic downturns have impacted Asia, and there is no clear trend as to whether the magnitude of those transmissions has decreased or intensified (Table 2.3). In the ASEAN region, a deceleration in US and EU economic growth has, on average, led to a more-than-proportional slowdown of growth among ASEAN countries. In fact, for every one percent deceleration in the United States, economic growth in the ASEAN region has slowed by 1.5 percent. In contrast, economic growth changes in other ASEM countries (China, India, Japan, Mongolia, Pakistan and South Korea) have had a less-than-proportional response to a US growth deceleration. These results refer to averages, however, and there have been considerable variations among non-ASEAN countries.

**Table 2.3: US and EU Recessions and ASEM Member Country Growth, 1982-2009**

	Recession					
	1982	1985	1991	2001	2009	Average
	Deceleration in GDP growth (mean for groupings) 1/					
United States	-4.5%	-3.1%	-2.0%	-2.9%	-3.9%	-3.3%
European Union	1.0%	-0.1%	-1.6%	-1.9%	-5.1%	-1.5%
ASEM, of which	-0.2%	1.1%	-1.4%	-2.7%	-4.8%	-1.6%
ASEAN	-2.7%	-7.8%	-1.1%	-5.1%	-6.0%	-4.6%
China, Japan, Korea	0.0%	1.7%	-1.3%	-2.5%	-4.9%	-1.4%
India, Mongolia, Pakistan	-1.8%	0.8%	-3.2%	-1.9%	-2.9%	-1.8%
	Ratio of ASEM Growth Changes to US Growth Changes					
ASEM, of which	0.04	-0.37	0.70	0.92	1.24	0.50
ASEAN	0.61	2.57	0.55	1.75	1.54	1.41
China, Japan, Korea	-0.01	-0.55	0.65	0.87	1.28	0.45
India, Mongolia, Pakistan	0.41	-0.25	1.54	0.65	0.74	0.62
	Ratio of ASEM Growth Changes to EU Growth Changes					
ASEM, of which	-0.20	-19.98	0.88	1.40	0.94	-3.39
ASEAN	-2.75	137.61	0.70	2.69	1.17	27.88
China, Japan, Korea	0.03	-29.53	0.82	1.34	0.97	-5.27
India, Mongolia, Pakistan	-1.85	-13.48	1.95	0.99	0.56	-2.37
	Percent of Countries Experiencing Growth Deceleration					
ASEM, of which	64%	67%	56%	94%	88%	74%
ASEAN	75%	78%	60%	90%	80%	77%
China, Japan, Korea	33%	67%	33%	100%	100%	67%
India, Mongolia, Pakistan	67%	33%	67%	100%	100%	73%

Source: Based on real GDP data from IMF, World Economic Outlook database, April 2009. Table design adopted from World Economic Outlook (IMF 2007) and K. Hong, J-W Lee and H.C. Tang, "Crises in Asia: Historical Perspectives and Implications". ADB Economic Series Working Papers No. 152, April 2009.

1/ Deceleration refers to change in GDP growth.

The US and EU economic recessions of the last 25 years have impacted the Asian economies differently. The 1982 US recession, brought about by credit tightening and accompanying increases in interest rates, created large output contractions in developing Asia. The stock market crash on October 1987 followed by the 1990 Gulf War combined to produce the 1991 US recession, but its spread to Asia was mitigated by more moderate downturns in Europe and Japan. In contrast, the 2001 "dot-com bubble", followed by the September 11 attacks in the United States, had a profound effect on East Asia. The December 2007 collapse of the US and EU housing market that impacted the banking sector caused an enormous liquidity and solvency crises; it rapidly spread to Asia and affected much of the region to a far greater extent than the earlier recessions. In the fourth quarter of 2008 imports of the G7 countries contracted

by 10 percent from the previous quarter, and in the first quarter of 2009 they decreased by another 14 percent.<sup>14</sup> The effect on Asia's exports was severe. Japan's exports to the United States and Europe fell sharply, South Korea's exports also contracted, and foreign exchange reserves of Pakistan suffered from mounting debt obligations. In the ASEAN member countries, the International Monetary Fund attributes the attributes the rapid speed and intensity of the spillover to both the region's large integration in the global economy and its deepening financial ties.<sup>15</sup>

#### 1.4. Dynamics Underlying Business Cycle Transmissions

The recent volatility of economic activity in the ASEM countries makes the prediction of short-term activity difficult. Nonetheless, systemic linkages to the United States and the European Union are relatively stable and robust, and we are therefore interested in capturing the dynamics underlying those interconnections. Our estimates of the international transmission of income and other changes on the ASEM countries separate the long-run or equilibrium relationships between domestic income and foreign income from the short-run or dynamic disequilibrium components of those relationships. Estimates of the ASEM countries' global linkages are based on an error-correction mechanism (ECM) specification that provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. The ECM adjusts for any disequilibrium between variables that are cointegrated. As a result, it provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. A closely related specification known as the "error-correcting mechanism" (also having the acronym ECM) models both the short and long-run relationships between variables.

**Table 2.4: Foreign Income Elasticities**

Country or Grouping	Global Regions	Short-Term Elasticity	Long-Term Elasticity
ASEAN	US plus EU	0.94	1.00
China	US plus EU	0.56	2.43
India	US plus EU	0.26	2.67
Other ASEM	US plus EU	0.86	0.45

Note: The elasticity measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the real GDP growth of the United States and the European Union.

The estimates in Annex A point to a number of generalizations about the relationship between Asia's economic growth and that of the United States and Europe. As the summary Table 2.4 shows, the foreign income elasticities for the ASEM countries are generally consistent with expectations. The short-term foreign income elasticities have a mean average of 0.66, and they range from a low of 0.26 in India to an average of 0.94 for the ASEAN member countries. The long-term foreign income elasticities have a mean average of 1.64, and range from 0.45 in other ASEM countries (Japan, Korea, Mongolia and Pakistan) to around 2.5 in China and India.

The short-term elasticities are consistent with those found in earlier studies. The International Monetary Fund (IMF) found that a 1 percentage point fall in US growth leads to around a 0.5 percentage point decline in growth in the East Asian Newly Industrialized Economies (NIEs, consisting of South Korea, Taiwan, Hong Kong, and Singapore) and the ASEAN-4 (Indonesia, Malaysia, Philippines, and Thailand).<sup>16</sup> While the estimates for China and India appear robust in

<sup>14</sup> Based on data from OECD International Trade Statistics, "Trade flows' collapse continues in first quarter 2009". Paris, 15 July 2009.

<sup>15</sup> International Monetary Fund (2009a), "Asia and Pacific. Global Crisis: The Asian Context". World Economic and Financial Surveys. Washington, DC, May 2009.

<sup>16</sup> International Monetary Fund, "World Economic Outlook". April 2007. See in particular, Chapter 4: "Decoupling the Train? Spillovers and Cycles in the Global Economy."

our estimates, the results for the ASEAN countries are probably underestimated because of the aggregation of country data. Using individual country estimated for those countries in an earlier study, we found the average long-term elasticity to be higher, specifically, it was 2.0 for the ASEAN members, which is twice the estimate using aggregated data in the present study.<sup>17</sup> For China and India, the results support expectations of high foreign income elasticities since developments in these countries have been closely tied to the US and EU markets, and their domestic economic growth has substantially outpaced that of the US and EU markets. Nonetheless, it is important to note that the dynamics underlying the adjustment process indicate that China and India generally adjust more slowly to foreign income changes than the ASEAN member countries.

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<sup>17</sup> See M. Lord "Modeling ASEAN Global Linkages". Manila, Asia Development Bank, 1999.

### III. ASIA LINKAGES AND DECOUPLING IMPLICATIONS

#### A. Trade Linkages

##### 1. Growing External Exposure of Asian Economies

The rapidity with which ASEM member countries have opened their economies in the last 15 years is impressive (Table 3.1). Although all of the Southeast Asian economies initially embarked on import-substituting industrialization, over time they shifted to export-oriented industrialization policies, starting with Singapore in the late 1960s, followed by Malaysia, the Philippines, and Thailand in the 1970s, and finally Indonesia in the mid-1980s. Export-oriented industrialization led to an opening of the economies to more markets, and the promotion of foreign direct investment (FDI) as a means of upgrading the industrial structures through the transfer and diffusion of advanced industrial technologies. As a result, the exposure of the economies to foreign trade is now large, nowhere more so than in Malaysia and Singapore. In terms of changes over the last two decades, however, Cambodia has experienced the largest opening of its economy. Other countries having experienced a dramatic growth in the exposures to trade are India, Thailand, Vietnam and China. In contrast, the exposures of Brunei Darussalam, Indonesia and Pakistan have changed little, if any, from what they were in the early 1990s.

**Table 3.1: ASEM Member Country Exports as Percent of GDP**

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Brunei	61.8	59.7	59.9	57.2	50.5	55.8	67.4	69.5	67.1	69.3	68.8	70.2	71.8	67.7
Cambodia	2.4	31.2	25.4	33.7	31.8	37.2	49.9	52.7	55.4	56.5	63.6	64.1	68.6	65.3
Indonesia	25.3	26.3	25.8	27.9	53	35.5	41	38.2	32.7	30.5	32.2	34.1	31	29.4
Lao PDR	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Malaysia	74.5	94.1	91.6	93.3	115.7	121.3	119.8	110.4	108.3	106.9	115.4	117.5	116.7	110.2
Myanmar	1.9	0.8	0.7	0.6	0.4	0.3	0.5	0.5	0.4	0.2	0.2	na	na	na
Philippines	27.5	36.4	40.5	49	52.2	51.5	55.4	49.2	50.2	49.6	50.9	47.6	47.3	42.6
Singapore	183.2	187	181.6	175.2	172.7	183.9	195.6	191.6	192.3	212.5	225.4	238.5	246.2	230.9
Thailand	34.1	41.8	39.3	48	58.9	58.3	66.8	65.9	64.2	65.7	70.7	73.4	73.5	73.2
Vietnam	36	32.8	40.9	43.1	44.8	50	55	54.6	56.8	59.3	65.7	69.4	73.6	76.8
China	19.0	20.2	20.1	21.8	20.3	20.4	23.3	22.6	25.1	29.6	34.0	37.3	39.9	40.7
Japan	10.4	9.2	9.8	10.9	10.9	10.3	11.0	10.6	11.4	12.0	13.3	14.3	16.1	17.6
Korea	28.0	28.8	27.9	32.4	46.2	39.1	40.8	37.8	35.3	37.9	44.0	42.3	43.0	45.6
India	7.1	11.0	10.5	10.8	11.2	11.7	13.2	12.8	14.5	14.8	18.1	19.9	22.1	21.2
Mongolia	na	na	na	na	na	na	na	na	na	57.7	66.7	64.3	65.3	na
Pakistan	14.8	16.7	16.9	16.1	16.5	15.4	13.4	14.7	15.2	16.7	15.7	15.7	15.3	13.9
<b>ASEAN avg</b>	<b>49.6</b>	<b>56.7</b>	<b>56.2</b>	<b>58.7</b>	<b>64.4</b>	<b>66.0</b>	<b>72.4</b>	<b>70.3</b>	<b>69.7</b>	<b>72.3</b>	<b>77.0</b>	<b>89.4</b>	<b>91.1</b>	<b>87.0</b>
<b>ASEM avg</b>	<b>37.6</b>	<b>42.6</b>	<b>42.2</b>	<b>44.3</b>	<b>48.9</b>	<b>49.3</b>	<b>53.8</b>	<b>52.2</b>	<b>52.1</b>	<b>54.6</b>	<b>59.0</b>	<b>64.9</b>	<b>66.5</b>	<b>64.2</b>

Source: Asian Development Bank, *Key Economic Indicators for Asia and the Pacific 2008*. Manila, August 2008.

##### 2. Exposure to US and EU Markets

Notwithstanding the growing openness of the Asian economies, most countries have succeeded in reducing their dependence on the US and EU markets (Table 3.2). However, the sharp reductions that occurred in 2008 relative to 2007 raise some questions about whether this past trend will continue for the region as a whole. The ASEAN member countries have lowered their reliance on the US market from 16 to 11 percent between 1980 and 2008, while the share of exports to the EU market fell more moderately from 13 to 11 percent. In contrast, China has increased its share to the US and EU market from 5 to 18 percent and from 15 to 20 percent respectively.

**Table 3.2: Changing Trade Exposure of ASEM Economies to the US and EU Economies a/**

	United States					European Union				
	1980	1990	2000	2007	2008	1980	1990	2000	2007	2008
Brunei	8.6%	3.4%	12.0%	5.5%	1.1%	0.0%	0.2%	3.6%	1.2%	0.2%
Cambodia	na	0.0%	65.9%	58.1%	53.9%	na	5.0%	20.6%	20.9%	22.5%
Indonesia	19.6%	13.1%	13.7%	10.2%	9.8%	6.7%	12.2%	14.3%	11.6%	11.5%
Lao PDR	na	0.1%	2.3%	1.4%	2.5%	na	9.4%	26.2%	12.2%	10.9%
Malaysia	16.3%	16.9%	20.5%	15.6%	13.0%	18.3%	15.5%	14.0%	12.8%	10.7%
Myanmar	0.5%	2.3%	22.4%	0.0%	0.0%	12.8%	6.9%	16.7%	6.9%	3.7%
Philippines	27.5%	37.9%	29.8%	17.0%	12.8%	18.0%	18.5%	18.1%	17.0%	10.9%
Singapore	12.3%	21.2%	17.3%	8.9%	7.1%	13.3%	15.5%	14.0%	10.7%	10.3%
Thailand	12.7%	22.7%	21.3%	12.6%	11.4%	26.6%	23.3%	16.3%	13.8%	12.8%
Vietnam	na	0.0%	5.1%	20.8%	20.7%	na	7.9%	20.5%	18.5%	18.5%
China	5.4%	8.5%	20.9%	19.1%	18.4%	14.8%	10.2%	16.4%	19.9%	20.1%
Japan	24.4%	31.6%	30.1%	20.4%	17.8%	15.6%	20.7%	16.8%	14.7%	14.0%
South Korea	26.5%	28.6%	21.9%	12.3%	10.8%	16.9%	15.0%	14.3%	14.7%	12.4%
India	11.5%	15.1%	21.3%	14.9%	13.1%	24.7%	28.5%	24.3%	21.4%	20.7%
Mongolia	na	2.0%	24.3%	4.8%	2.6%	na	25.6%	7.7%	6.1%	4.6%
Pakistan	5.3%	12.4%	25.2%	18.0%	16.0%	21.9%	36.7%	27.9%	22.2%	22.1%
<b>Sub-Total ASEAN</b>	<b>16.2%</b>	<b>19.4%</b>	<b>19.0%</b>	<b>12.4%</b>	<b>10.7%</b>	<b>12.9%</b>	<b>16.0%</b>	<b>15.0%</b>	<b>12.6%</b>	<b>11.4%</b>
<b>Total ASEM</b>	<b>20.2%</b>	<b>25.1%</b>	<b>23.7%</b>	<b>16.7%</b>	<b>15.2%</b>	<b>15.2%</b>	<b>18.1%</b>	<b>16.1%</b>	<b>16.4%</b>	<b>15.8%</b>

a/ Trade exposure is measured as the exports to the United States or the European Union relative to total exports to all destinations. Source: International Monetary Fund (IMF), Direction of Trade database (July 2009).

### 3. Dynamics of Trade Linkage

Movements in both trade volumes and world market prices for traded commodities have impacted on the foreign demand for ASEM country exports in various degrees. The importance of foreign firms in the export sector is well-documented and there is ample evidence that export-orientation is one of the most important determinants of FDI flows (see, for example, Singh and Jun, 1995 and references therein). Moreover, the terms-of-trade shocks that hit Southeast Asia in 1997 had major repercussions on corporate earnings expectations. Stock markets in those countries contracted sharply, particularly in Thailand, Malaysia and the Philippines, and both foreign and domestic investors began to move funds offshore (Noland *et al.*, 1998). At the same time, the growing openness of the Asian economies has deepened the close link of economic growth to the rapidly changing global economy, and produced rapid advances in all areas of globalization covering trade, cross-border investments and international financial activities.

To gauge the magnitude of Asia's trade dependence, especially with the United States and the European Union, we used world market prices for primary non-fuel commodities relative to those of manufactures, as well as the volume of total US and EU imports of goods.<sup>18</sup> To measure the effect of foreign direct investment and portfolio flows, we used the broad measure of developing Asia net private capital flows, available from the International Monetary Fund.<sup>19</sup> The estimates of the relationship for the ASEAN member countries, China and other ASEM countries are detailed in Annex A and summarized in Table 3.3.

<sup>18</sup> Commodity exports of the ASEM countries encompass a fairly broad range of products such as rubber, palm oil, tin, sugar, coconut oil, maize, and other agricultural and mineral commodities. We used the IMF's broad-based price series for primary commodities, which is an index covering 31 agricultural, mineral and metal commodities. For manufactures, we used the World Bank's Manufactured Unit Value (MUV) index, which is a composite index of prices for manufactured exports from the five major (G-5) industrial countries (France, Germany, Japan, the United Kingdom, and the United States) to low- and middle-income economies, valued in U.S. dollars. The MUV index covers products in Standard International Trade Classification (SITC) groups 5–8 and is constructed using trade-weighted unit value indexes for each country.

<sup>19</sup> Based on data available from International Monetary Fund (IMF), International Financial Statistics database, June 2009.

**Table 3.3: Foreign Income, Financial Indicator and World Trade Elasticities of Asian Economies**

Country or Grouping	Global Regions	Foreign Income Elasticity		Commodity Terms of Trade		Foreign (US-EU) Import Demand		Asian Private Capital Flows	
		Short-Term	Long-Term	Short-Term	Long-Term	Short-Term	Long-Term	Short-Term	Long-Term
ASEAN	US plus EU	0.40	1.00	0.11	0.28	0.39	0.63	0.40	1.25
China	US plus EU	0.18	1.41	0.15	0.83	-	-	0.01	0.05
Other ASEM	US plus EU	0.12	1.00	0.09	0.33	0.16	0.17	0.01	0.08

Notes:

1. Foreign Income Elasticity: Measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the real GDP growth of the United States and the European Union.
2. Commodity Terms of Trade: Measures the percentage change in brought about by a 1 percent change in the relative prices of non-fuel commodities to manufactures.
3. Foreign Import Demand Elasticity: Measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the volume of imports of the United States and the European Union.
4. Asia Private Capital Flows Elasticity: Measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the net private capital flows of the developing Asian economies. Net private capital flows comprise net direct investment, net portfolio flows, and other long- and short-term net investment flows including official and private borrowing.

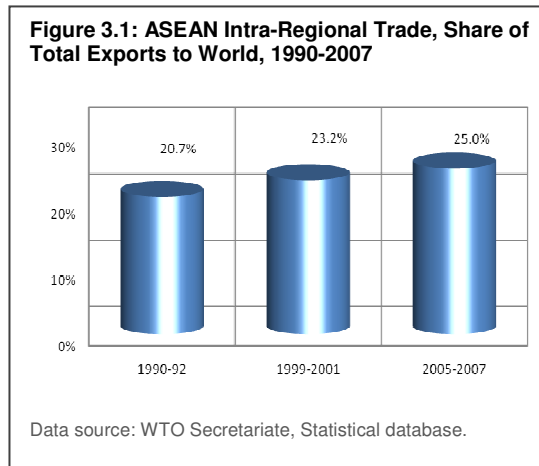
As expected, US and EU import volumes and world commodity market prices relative to those of manufactures are significant in explaining changes in the ASEAN and other ASEM countries' real GDP. Although US and EU import volumes were not statistically significant in determining GDP movements, overall world trade volumes were found to be an important determinant of GDP, suggesting that China's economy is not as open as most other Asian countries and that there is somewhat less concentration in the US and EU markets. The average of the estimated US and EU import elasticities equals for the ASEAN countries (0.6) is substantially higher than that of the other ASEM countries (0.2). In the case of the global terms of trade, the average elasticity is higher in China than in the rest of the Asian country groupings. For private capital flows, the elasticity is much higher in the ASEAN member countries than in the rest of Asia. These flows refer to private capital flows and comprise net direct investment, net portfolio flows, and other short and long-term net investment flows, including official and private borrowing. They reflect both the existence of large foreign direct investment into the region and the rising importance of portfolio flows in the ASEAN economies.<sup>20</sup>

## B. Intra-Regional Trade and Global Production Networks

Asia's declining share of trade with the United States and the European Union is partly due to the considerable expansion of trade within the region. In the ASEAN area, for example, the combined value of total exports of member countries has grown by five percentage points since the early 1990s (Figure 3.1). It would be misleading, however, to suggest that this trend reflects a growing decoupling of the region from US and EU business cycles. Indeed, many of the products traded between the ASEAN countries has grown from the globalization of production

<sup>20</sup> In a more detailed study of international trade linkages for the ASEAN member countries, Lord (1999) examined interest rate differentials and investment risks effects on capital markets. He used four alternative measures: (a) the ratio of the Japanese yen LIBOR three-month rate to the US dollar LIBOR rate, (b) the ratio of the Japanese yen lending rate to the US dollar LIBOR rate, (c) ratio of the nominal lending rates in each ASEAN-5 country to the Japanese yen LIBOR three-month rate, and (d) ratio of the nominal lending rates in each ASEAN-5 country to the US dollar LIBOR rate. To measure investment risk effects, the study he uncovered interest parity relationship, an investor will be indifferent between borrowing abroad or at home if the following relationship holds:  $i_t = i_t^f + \Delta s_t^e + \gamma_t$ , where  $i$  is the domestic loan rate,  $i^f$  is the foreign loan rate,  $\gamma$  is the risk premium from the risk differential of the foreign and domestic loans, and the term  $\Delta s_t^e = (S_{t+k}^e - S_t)/S_t$  is the expected change in the real exchange rate.<sup>20</sup> Since  $\gamma_t = (i_t - i_t^f) - \Delta s_t^e$ , the expectation of a devaluation of the domestic currency will increase the risk premium for foreign loans, while the expectation of an appreciation will lower the risk premium. If  $\Delta \gamma_t > 0$  domestic intermediaries will reduce foreign borrowing, as well as domestic loans for asset purchases. Alternatively, if  $\Delta \gamma_t < 0$  domestic intermediaries will increase foreign borrowing and domestic loans for asset purchases.

activities and the associated expansion of intra-industry trade in processing and assembly products as part of cross-border supply chains (Table 3.4). Asian economies are therefore increasingly specializing in the intermediate stages of the production chain, with assembly into final goods occurring in China. These goods are then shipped to their destination markets within and outside the region, including the United States and the European Union. With China providing the final assembly stage, most Asian economies now ship fewer goods directly to the United States, although intra-regional shipments of intermediate goods continue to rise. However, the ADB has estimated that, after tracking the ultimate destination of trade of intermediate goods, as much as 60 percent of East Asia's exports are ultimately destined for the US, EU and Japanese markets.<sup>21</sup>



International outsourcing by large enterprises procurement activities involving multiple enterprises, suppliers, manufacturers and retailers. Not only have value chains become one of the principal driving forces behind private sector development throughout Asia, but governments in the region are increasingly supporting programs to enhance international networking capabilities. International development agencies like the World Bank and the Asian Development Bank are providing technical assistance and loans that provide support to value chain systems as a means of boosting exports and encouraging the commercial development of small and medium size enterprises (SMEs).<sup>22</sup>

depend on borderless manufacturing and

**Table 3.4: Top Export Product Categories of ASEAN Countries, 2007**

HS Code	Description	Percent of Total Exports	
		Intra-ASEAN	Extra-ASEAN
85	Electric machinery, equipment and parts	24.8%	23.8%
84	Machinery and mechanical appliances	15.2%	14.6%
27	Mineral fuels, mineral oils & products	19.3%	11.1%
<b>Sub-Total of All Exports</b>		<b>59.3%</b>	<b>49.5%</b>

### C. FDI Flows within Asian Region

Globalization has often focused on the US-EU-Japan triad. In Asia the pattern of FDI and cross-border equity flows with the triad reflected changes that were brought on by currency realignments between the mid-1980s and 1990s. When the US dollar fell against East Asian currencies between 1987 and 1996, exports from the region shifted from the United States and Europe to Japan as relative price movements induced a gradual depreciation of the real effective exchange rates of many of the developing East Asian economies.<sup>23</sup> As the yen began to appreciate in both nominal and real terms, Japanese firms relocated their production activities to those Asian countries having low labor and natural resource costs. As a result, capital stocks

<sup>21</sup> Asian Development Bank, "Asian Development Outlook 2007". Manila, 2007

<sup>22</sup> See, for example, World Bank, "Building Export Competitiveness in Laos". Background Report. East Asia PREM. November 2006; Foreign Investment Advisory Service, "Moving Towards Competitiveness: A Value Chain Approach". Foreign Investment Advisory Service (FIAS), World Bank, 2007; Asian Development Bank, "South Asia Strategic Framework for Aid for Trade Road Map". March 2009; and Asian Development Bank, "Country Strategy and Program Update 2007-2010: Viet Nam, Socialist Republic of", 2009.

<sup>23</sup> For a description of the shift in East Asia's exports from the United States and other industrialized countries to markets within the region following the currency realignment of 1986, see Robertson (1994).

of Japan in the Asian region have been catching up with those of the United States.<sup>24</sup> At the same time, EU transnationals started to penetrate the Asian region.<sup>25</sup> However, in the aftermath of the 1997 Asian financial crisis, FDI inflows into South, East and South-East Asia fell to 10 percent of the world total, down from a high of 23 percent in 1996.<sup>26</sup> In the first half of the current decade, Asia was able to recover much of its share of total world FDI, and by 2005 its share had risen to 20 percent of annual flows. Although 2007 FDI flows to the region reached a record level of \$248 billion, the global economic slowdown caused sharp inward FDI declines in Japan, the Philippines, Singapore, South Korea, Taiwan and Thailand. In contrast, the UNCTAD World Investment Report has reported a continued rise in inflows in China, India, Indonesia, Malaysia and Vietnam, though a downturn is expected to have occurred in the first part of 2009 in these countries.<sup>27</sup>

China and India have now become an important source of capital flows for the rest of Asia. China has been directing nearly 60 percent of its FDI towards the Asian economies and, while the US and EU shares of total FDI inflows into ASEAN have recently declined, that of China has grown significantly. Concurrent with these flows have been large FDI flows from East Asia into China. Yet China's FDI growth has not occurred at the expense of other countries in the region since FDI flows to East Asian have themselves increased sevenfold since the early 1980s.

**Table 3.5: Main Sources of Foreign Direct Investment Inflow to ASEAN Region, 2006-2008**

	Share of total inflow		
	2006	2007	2008
European Union	19.4	26.5	20.3
United States	6.2	9.1	5.9
Asia, of which	38.9	34.2	36.1
ASEAN	13.8	13.5	18.4
Japan	18.6	12.1	12.8
Korea	2.3	4.5	2.1
China, Mainland	1.8	1.8	1.9
China, Hong Kong	2.3	2.3	0.9
Sub-Total	64.5	69.8	62.2
Other	35.5	30.2	37.8
<b>Total FDI inflows</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Based on data from ASEAN Foreign Direct Investment Statistics Database

## D. Globalization of Financial Markets

Asia's financial linkages with the United States and the European Union have been manifest in stock market developments. Table 3.6 show the close association between movements in the US stock market (represented by the S&P 500 index), the European stock market (represented by the FTSE 100 index) and Asian stock markets (represented by the Heng Seng, NIKKEI and the Kuala Lumpur Stock Exchange indices). The US and the European stock markets generally move in tandem, as does the Japanese NIKKEI stock market with those of the United States and Europe. There has been somewhat less synchronization of movements in Hong Kong's Heng Seng index, although this phenomenon reflects a recent divergence from a much closer association in 2000-2006. Recent empirical work on the financial linkages between emerging market stock markets and those in the major US and European financial centers supports the view

**Table 3.6: Asia, US and EU Stock Market Developments, 2000 to mid-2009**

	United States	Europe	Asia		
	S&P500	FTSE 100	Hang Seng	NIKKEI	KLSE
Correlation with S&P 500	1.00	0.95	0.72	0.91	0.58
Average Monthly Change (+ or -)	5.1%	9.5%	8.4%	3.2%	13.5%
Volatility Index	16.4%	15.0%	23.7%	20.9%	18.0%

Note: The Black-Scholes index of volatility is calculated as the standard deviation of the natural log of price changes, adjusted by the square root of the number of months in the sample.

<sup>24</sup> For details, see (Kawai, 1997).

<sup>25</sup> Recent estimates by Anderson and Francois (1997), however, show that the expansion is likely to be gradual.

<sup>26</sup> All data in this section related to FDI flows are from UNCTAD FDI/TNC database.

<sup>27</sup> Based on information from Oxford Analytica, as reported by *Forbes*, 8 May 2009.

that these markets are highly correlated, and that the extent of co-movements among these markets has grown to such an extent in recent years that de-coupling these financial markets is unlikely to occur.<sup>28</sup>

While the empirical evidence is widely accepted, the explanations for these financial linkages vary. A study by Brooks and del Negro (2002) found that a company's exposure to international sales is directly related to its stock's exposure to global shocks and, to the extent that business cycles are synchronized across countries and regions, the degree of financial linkages increases. Similarly, a study by Forbes and Chinn (2003) found a close relationship between real variables and financial market returns across countries since the mid-1990s. They also found that trade linkages are more significant determinant of co-movements in financial markets than linkages through foreign direct investment and other financial flows. In contrast, a study by Imbs (2003) interpreted the evidence on financial linkages as being the result in increased co-movements of trade and production movements across countries and region, suggesting that the causality order is the opposite. The implication of these differing interpretations is that while co-movements are generally acknowledged to exist, explanations about their causality differ and have yet to converge to a generally accepted explanation.

**Table 3.7: ASEM Countries' Nominal Exchange Rates (local currency per US dollar), 1980-2008**

	Average Annual Change		Volatility 1980-2008
	2000-2008	2008	
Brunei	-1.9%	-6.0%	4.3%
Cambodia	0.7%	0.0%	23.8%
Indonesia	2.8%	6.1%	24.8%
Lao PDR	4.1%	0.0%	31.0%
Malaysia	-1.4%	-3.0%	7.3%
Myanmar	-1.5%	-3.1%	5.4%
Philippines	1.8%	-3.6%	11.7%
Singapore	-1.9%	-6.1%	4.3%
Thailand	-1.2%	-3.5%	8.2%
Vietnam	1.8%	1.2%	12.5%
China	-1.9%	-8.7%	10.6%
Japan	-0.8%	-12.2%	10.7%
Korea	-0.4%	18.6%	11.1%
India	0.2%	5.2%	7.0%
Mongolia	1.5%	-0.4%	12.4%
Pakistan	4.2%	15.9%	5.7%

Data source: International Monetary Fund database.  
Note: The Black-Scholes index of volatility is calculated as the standard deviation of the natural log of exchange rate changes.

## E. International Currency Linkages

### 1. Exchange Rate Misalignments

Since the middle of the last century the dollar's dominance as the international numeraire and exchange medium to trade across multiple currencies has been supported by five drivers: the United States' large economic size, political stability and well-developed financial system, confidence in the currency's value, and its so-called network externality whereby the currency has become more valuable as more people use it.<sup>29</sup>

The dollar's movements has had mixed effects on the ASEM countries, largely depending on conditions dictated by their exchange rate regimes (Table 3.7). Most countries have informally managed their currencies, while retaining the official policy of free-floating regimes. For example, China maintains a de facto peg to the dollar (adjusted in June 2008), and Malaysia keeps the ringgit within a narrow range relative to the dollar. Despite these efforts, however, countries like Korea, Pakistan and India experienced substantial nominal devaluations

<sup>28</sup> N. Frank and H. Hesse, "Financial Spillovers to Emerging Markets during the Global Financial Crisis". International Monetary Fund, IMF Working Paper WP/09/104, May 2009.

<sup>29</sup> For a review of the literature on international currencies and the dollar's status as the world's dominant international currency, see E-G Lim, "The Euro's Challenge to the Dollar: Different Views from Economists and Evidence from COFER (Currency Composition of Foreign Exchange Reserves) and Other Data". IMF Working Paper WP/06/153. Washington, DC, International Monetary Fund, June 2006. In addition to reviewing the literature on the euro's challenge to the dollar as an international currency, the paper examines the role of international money and the dollar's dominance as a medium of exchange, unit of account and store of value.

**Table 3.8: ASEAN-5 Real Effective Exchange Rates (REER) by Region, 1980-2008 (2000=100)**

	Indonesia						Malaysia					
	World	US	EU	China	Japan	Other ASEAN	World	US	EU	China	Japan	Other ASEAN
1990	62.4	57.2	80.3	65.1	51.7	67.7	83.3	76.4	107.2	86.9	69.0	98.8
1991	63.2	57.7	78.5	58.5	55.6	69.1	84.9	77.5	105.5	78.6	74.7	101.4
1992	65.2	57.6	82.8	58.2	58.2	73.9	80.1	70.6	101.6	71.4	71.4	96.4
1993	63.2	55.6	71.9	59.9	62.9	71.1	80.7	71.0	91.9	76.5	80.4	97.8
1994	63.4	54.4	71.1	47.4	65.7	72.5	83.4	71.6	93.6	62.4	86.5	103.3
1995	65.4	53.2	76.1	54.5	67.8	75.1	83.8	68.1	97.5	69.7	86.8	103.1
1996	61.3	53.3	73.9	57.7	57.1	76.0	78.2	68.0	94.4	73.6	72.9	103.9
1997	69.1	63.8	77.1	69.6	61.2	81.7	82.2	75.8	91.7	82.7	72.8	101.8
1998	142.0	141.0	167.0	150.5	124.0	144.3	102.7	102.0	120.7	108.8	89.6	97.4
1999	97.0	93.6	109.7	96.4	92.3	99.7	101.7	98.2	115.1	101.1	96.8	105.8
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	106.5	112.3	108.3	110.1	96.2	104.6	96.1	101.4	97.7	99.3	86.8	92.0
2002	87.9	92.6	94.8	88.7	75.0	86.4	96.0	101.2	103.5	96.8	81.9	96.7
2003	81.5	81.8	100.0	77.4	69.8	76.1	102.1	102.4	125.2	96.9	87.4	101.6
2004	84.9	82.5	110.3	79.0	73.5	77.5	106.6	103.7	138.6	99.3	92.4	103.9
2005	85.0	83.8	111.0	79.9	70.7	79.8	105.1	103.6	137.3	98.8	87.4	104.6
2006	72.7	72.2	95.4	69.5	56.1	72.9	100.7	100.0	132.2	96.3	77.7	110.6
2007	72.1	69.9	100.1	71.8	52.1	76.1	97.5	94.5	135.4	97.1	70.5	111.6
2008	76.2	70.1	107.3	80.4	58.2	81.7	98.1	90.3	138.2	103.6	75.0	112.4
	Philippines						Singapore					
	World	US	EU	China	Japan	Other ASEAN	World	US	EU	China	Japan	Other ASEAN
1990	104.8	96.0	134.8	109.2	86.7	130.6	103.3	94.6	132.9	107.7	85.5	128.4
1991	104.6	95.5	130.0	96.8	92.0	130.7	99.6	90.9	123.7	92.2	87.6	123.2
1992	95.0	83.9	120.7	84.8	84.7	119.1	97.9	86.4	124.3	87.3	87.3	123.4
1993	97.0	85.3	110.4	92.0	96.6	122.6	98.1	86.2	111.6	92.9	97.7	124.2
1994	91.2	78.2	102.3	68.2	94.5	115.2	94.6	81.1	106.1	70.7	98.0	120.4
1995	88.8	72.1	103.3	73.9	92.0	110.8	93.7	76.1	108.9	77.9	97.1	118.2
1996	79.8	69.4	96.3	75.2	74.5	106.6	88.4	76.8	106.6	83.2	82.4	120.7
1997	81.8	75.4	91.2	82.3	72.4	101.2	88.0	81.2	98.2	88.5	77.9	110.8
1998	97.6	96.9	114.7	103.4	85.2	91.3	93.8	93.2	110.3	99.4	81.9	86.8
1999	92.1	89.0	104.2	91.6	87.7	93.5	99.8	96.4	112.9	99.2	95.0	103.4
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	105.2	111.0	107.0	108.8	95.1	103.1	100.3	105.8	102.0	103.7	90.6	97.1
2002	105.2	110.9	113.5	106.1	89.8	108.4	102.3	107.8	110.3	103.2	87.3	104.7
2003	114.9	115.2	140.8	109.0	98.3	117.4	106.5	106.8	130.6	101.1	91.2	107.1
2004	118.7	115.4	154.3	110.5	102.8	118.4	107.6	104.6	139.9	100.2	93.2	105.1
2005	110.4	108.9	144.2	103.8	91.9	111.2	107.5	106.0	140.4	101.0	89.4	107.6
2006	99.3	98.6	130.3	94.9	76.6	108.7	104.2	103.5	136.8	99.6	80.4	115.3
2007	91.5	88.7	127.1	91.1	66.2	103.2	102.0	98.9	141.6	101.6	73.7	117.9
2008	88.2	81.2	124.2	93.1	67.4	98.5	98.3	90.5	138.4	103.8	75.1	112.7
	Thailand						ASEAN-5					
	World	US	EU	China	Japan	Other ASEAN	World	US	EU	China	Japan	Other ASEAN
1990	82.2	75.3	105.7	85.7	68.0	97.0	79.0	73.8	96.7	81.6	68.3	90.7
1991	81.1	74.0	100.7	75.1	71.3	95.7	78.7	73.3	93.8	74.1	71.2	90.6
1992	82.6	72.9	104.9	73.7	73.7	100.3	78.1	70.8	94.8	71.4	71.4	91.3
1993	82.4	72.4	93.8	78.1	82.0	100.3	77.6	70.2	86.0	74.4	77.3	90.8
1994	81.9	70.3	91.9	61.2	84.9	100.9	77.3	68.7	84.7	62.0	79.5	91.3
1995	83.3	67.6	96.9	69.3	86.3	102.3	78.2	66.6	88.3	67.8	80.5	92.0
1996	76.9	66.9	92.8	72.4	71.8	101.8	73.0	65.4	84.9	69.6	69.1	91.3
1997	87.0	80.3	97.1	87.5	77.1	109.2	78.7	73.9	86.0	79.2	71.6	93.5
1998	100.1	99.4	117.7	106.1	87.4	94.3	115.4	114.8	132.5	121.2	103.1	110.9
1999	95.9	92.6	108.5	95.4	91.3	98.3	98.1	95.4	108.3	97.7	94.3	100.4
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	106.2	112.0	108.0	109.8	96.0	104.3	103.0	107.6	104.4	105.8	95.0	100.8
2002	103.7	109.3	111.9	104.7	88.6	106.5	95.9	100.0	101.9	96.6	84.9	97.0
2003	105.8	106.1	129.7	100.4	90.6	106.2	96.5	96.7	113.7	92.7	85.6	95.9
2004	105.7	102.8	137.5	98.5	91.6	102.8	99.2	97.1	122.6	93.9	88.8	96.6
2005	103.0	101.6	134.6	96.8	85.7	102.1	98.0	97.0	121.4	93.5	85.2	97.1
2006	95.1	94.4	124.8	90.9	73.4	103.1	90.1	89.7	111.6	87.1	74.5	95.4
2007	89.3	86.6	124.0	89.0	64.6	100.2	87.5	85.5	113.2	87.2	69.2	95.5
2008	89.4	82.2	125.8	94.3	68.3	100.1	88.1	82.6	115.8	91.8	72.0	96.2

of their currencies in 2008, notwithstanding the weakening of the US dollar, while others like Japan, China and Singapore experienced large appreciations in their currencies.

### 1.1. Misalignments and International Competitiveness

How currency exchange movements impact on the competitiveness of the Asian economies depends on their real effective exchange rates (REERs), and their transmission mechanism within the economies.<sup>30</sup> To illustrate their impact on the Asian economies, we focus the empirical analysis on the ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore and Thailand). Not surprisingly, the results show that, as a group, there has been an erosion of the international competitiveness of these countries during this decade, particularly in the US, Chinese and Japanese markets, but also the EU market in more recent years. This phenomenon is due to the decline in the value of the U.S. dollar against most major currencies since 2002, as well as the use by most ASEAN countries of managed floats or arrangements other than freely floating exchange rates. These so-called competitive exchange rate management policies generally attempt to keep the relative value of currencies in line with the value of selected regional currencies, including that of the Chinese RMB (renminbi).<sup>31</sup> The result has been that all ASEAN-5 countries have experienced an appreciation of their currencies in real terms since 2005. The strengthening of these currencies generally undermines the trade balance, as exports become more expensive and imports cheaper.<sup>32</sup>

Table 3.8 shows the results of the REER calculations for the world as well as specific export markets. In the first half of the 1990s, the ASEAN-5's REER remained almost unchanged as devaluations of the currencies of some countries were offset by appreciations in those of others. Exports of all countries nevertheless surged during this period, particularly in Malaysia, Thailand and Singapore. In 1996 all ASEAN-5 currencies appreciated in real terms and,

**Table 3.9: ASEM Countries De Facto Classification of Exchange Rate Regimes, 2008**

	Exchange Rate Arrangement				Exchange Rate Anchor		Inflation Targeting	Monetary Policy
	Managed Float	Fixed Peg	Floating	Currency Board	US dollar	Composite		
Brunei				X				
Cambodia	X				X			
Indonesia	X						X	
Lao PDR	X				X			
Malaysia	X							X
Myanmar	X				X			
Philippines			X				X	
Singapore	X					X		
Thailand	X						X	
Vietnam		X						
China					X			
Japan			X					X
Korea			X				X	
India	X							X
Mongolia		X			X			
Pakistan	X				X			

**Source:** De Facto Classification of Exchange Rate Regimes and Monetary Policy Frameworks, as of April 13, 2008. Washington, DC, April 2009.

<sup>30</sup> The real exchange rate is defined as  $e^r_t = (e^n_t P^f_t) / P_t$ , where  $e^n$  is the nominal exchange rate,  $P^f$  is the foreign currency price of goods purchased abroad, and  $P$  is the domestic price level. A fall in  $e^r$  represents a real *revaluation* under a fixed exchange rate system, and an *appreciation* under a flexible exchange rate system. The fall is associated with either a rise in the nominal exchange rate  $e^n$  or a rise in relative prices of domestic goods (equivalent to a fall in relative prices of foreign goods). Conversely, a rise in  $e^r$  represents a real *devaluation* in a fixed exchange rate system, and a *depreciation* in a flexible exchange rate system.

<sup>31</sup> For a recent analysis of the exchange rate policies of East Asian countries and their effects on competitiveness, see M.F. Martin, "East Asia's Foreign Exchange Rate Policies". CRS Report to Congress, April 10, 2008.

<sup>32</sup> For useful description of the macroeconomic transmission mechanism of real exchange rate changes and empirical evidence of those transmissions in Asia, see E.X. Fan, "Implications of a U.S. Dollar Depreciation for Asian Developing Countries". ERD Policy Brief Series, Economics and Research Department, Number 11, 2002.

with the exception of Singapore, they all devalued sharply in 1997-98. Since then, most currencies have appreciated in real terms, particularly that of Indonesia. However, these movements differ across markets. The average real effective exchange rate of the ASEAN-5 appreciated more against the Japanese yen than against other major markets between 2004 and 2008. In contrast, most of the countries experienced real exchange rate devaluations against the euro between in the first half of this decade and have since then appreciated (Indonesia, Philippines, Thailand) or remained relatively unchanged against the euro (Malaysia and Singapore). All countries experienced real exchange rate appreciations against the US dollar between 2005 and 2008.

Volatility in the exchange rates of the Asian countries is generally considered to be unfavorable to their economies and most governments have adopted managed floats in their currencies, allowing them to fluctuate within a limited range over time (Table 3.9). Nearly all countries manage or peg their currencies to adjust in value in foreign exchange (forex) markets as long as their currencies do not exceed some defined values that could affect foreign currency, inflation limit or monetary policy limits. The notable exception is the Philippines, which until March 2008 allowed its currency to float freely in forex markets. Considerable competitive adjustments among most exchange rates throughout Asia have nonetheless taken place, impacting on the international competitiveness of most countries (Table 3.8).

## 1.2. Measuring the Magnitude of Transmissions

For the ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore and Thailand), we measured the effects of the following variables:

- Foreign income in the form of real GDP growth of the United States and the European Union.
- *Exchange rates* in the form of the real effective exchange rate of the ASEAN-5 countries;
- *International prices* in the form of the terms of world market prices for primary commodities relative to those of manufactures;
- *Foreign import demand* in the form of the volume of US and EU imports.
- *Capital inflows* in the form of the net private capital flows of the developing Asian economies, where net private capital flows comprise net direct investment, net portfolio flows, and other long- and short-term net investment flows including official and private borrowing.

The estimated equation is presented in the Annex and the estimated elasticities are summarized in Table 3.10. The results indicate that changes in these foreign income, trade and financial variables lead to a more-than-proportional change in the economic growth of the ASEAN member countries as a group. However, the level of statistical significance is higher for capital flows and real exchange rates than it is for trade, as measured by the US and EU import

**Table 3.10: ASEAN-5 Region's Foreign Income, Financial Indicator, World Trade, and Real Effective Exchange Rate Elasticities**

	Short-Term	Long-Term
Foreign Income Elasticity	0.35	1.33
Foreign (US-EU) Import Demand	0.12	1.11
Asian Private Capital Flows	0.02	1.17
Real Effective Exchange Rate	0.07	1.39

Notes:

1. *Foreign Income Elasticity*: Measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the real GDP growth of the United States and the European Union.
2. *Foreign Import Demand Elasticity*: Measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the volume of imports of the United States and the European Union.
3. *Asia Private Capital Flows Elasticity*: Measures the percentage change in real GDP of each country or grouping brought about by a 1 percent change in the net private capital flows of the developing Asian economies.
4. *Real Effective Exchange Rate (REER) Elasticity*: Measures the percentage change in real GDP of ASEAN group brought about by a 1 percent change in the REER for those countries.

demand. Commodity prices, measured through the terms of trade of primary commodities relative to manufactures, were not found to be statistically significant in explaining GDP movements, which is explained by the fact that some ASEAN countries are net importers of primary commodities, while others are net exporters.

## **F. Implications for Asia's Future Linkages**

The empirical evidence in this chapter as well as the previous one provides the basis for some forward looking views about Asia's linkages and prospects for decoupling as a means of mitigating adverse external effects from cyclical downturns and better insulating the region's economies from external shocks.

### **1. Business-cycle co-movements with the US and European economies are unlikely to diminish in the near to medium term.**

There are strong linkages both within Asia and between Asia and the United States and Europe. Although the magnitude of US and EU international transmissions on the Asian economies has varied across downturns, a deceleration in US and EU economic growth has, on average, led to a more-than-proportional slowdown of growth among ASEAN countries. Past business cycle correlations do not necessarily imply a similar degree of synchronization in the future, but the strength of the co-movements is sufficiently large to suggest that they will continue to impact on the Asian economies in the future. Moreover, the transmission channels have become more complex as new sources of those spillovers arise in terms of portfolio flows, stock market volatility, and integrated production networks. While these patterns suggest continued synchronization, they do not necessarily imply intensification.

### **2. Traditional channels of international transmissions in the form of trade linkages with the US and EU economies are likely to weaken as shifts occur towards greater trade with intra-Asia markets, as well as the Middle East and Central Asia.**

The ASEM countries' combined exports to the United States fell from 25 to 15 percent between 1990 and 2008, while those directed to the European Union fell more modestly, from 18 to 16 percent during the same period. There are significant downside risks for the recovery of growth in the United States and Europe. Over the medium term, US and EU consumer spending are expected to be sluggish relative to economies like China, where earlier high savings rates are expected to fall significantly as the government introduces stimulus packages to directly tackle high savings rates and spur domestic consumption and investment.<sup>33</sup> Increased spending on the country's social safety net, covering medical care and education particularly in rural areas, would help to lower precautionary savings.<sup>34</sup> Although it could lower capital available for investment, the IMF expects that the massive program of public investment initiated late last year will compensate for the decline in private investment and absorb productive resources no longer utilized in the tradable sector.<sup>35</sup> If Asia leads the recovery with China at its center, the policy focus should be on mechanisms to shift trade as well as investment from slow growth markets such as that of Europe to the more dynamic economies in Asia. That shift would support a structural change in Asia's trading patterns over the medium term.

### **3. As goods produced in Asia incorporate more technology-intensive processes,**

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<sup>33</sup> "Stimulus package has started bearing fruits". *China Daily* May 7, 2009. Available: [www.china.org.cn](http://www.china.org.cn).

<sup>34</sup> Yang, Zhengliao. "How to Spend the 4 Trillion Yuan." *News China* 5 Jan. 2009.

<sup>35</sup> International Monetary Fund, "Asia and Pacific. Global Crisis: The Asian Context". *Regional Economic Outlook. Asia and Pacific Global Crisis: The Asian Context*. World Economic and Financial Surveys. May 2009b.

***intra-regional networks could provide a vehicle for Asian-centric production activities.***

In the near term, multinationals will continue to be dominated by US, EU and, to a lesser extent, Japanese firms. In 2006 the top 50 transnational corporations (TNCs) accounted for about one-eighth of the estimated assets, sales and employment of all TNCs in the world. Of those TNCs, nine had parent companies in the United States, four were from Japan, and the remaining 37 were from European.<sup>36</sup> It is unlikely that, as a group, the shares of these top-ranked companies will be significantly eroded in the near to medium term. Managerial, technological, financial, and know-how requirements continue to be high for many sectors, and Asian companies often unable to effectively compete with TNCs as independent business entities.<sup>37</sup> Consequently, it is difficult for firms from within developing Asia to penetrate some of the markets dominated by TNCs.

One effective channel has been successfully pursued by Malaysia, whose government encourages investments by foreign transnationals as a means of attracting technology and production know-how through complementary relationships with those firms.<sup>38</sup> Another approach involves sub-regional cooperation schemes aimed at developing scale economies and private capital investment of the magnitude needed for firms to effectively compete at the global level.<sup>39</sup> However, schemes like the ASEAN Investment Area (AIA), which were established a decade ago to promote such cross-border investments, have been underutilized. Although the AIA provides for (a) eliminating investment barriers, (b) liberalizing investment rules and policies, and (c) granting national treatment to member countries, there are a large number of exceptions that create disincentives among private investors.<sup>40</sup> There is some hope, nevertheless, that cross-border investments among the larger Asian countries will take place, following a recent decision to combine the AIA with the ASEAN Agreement on the Promotion and Protection of Investments into a single ASEAN Comprehensive Investment Agreement (ACIA) in support of the development of an ASEAN Economic Community (AEC).<sup>41</sup>

**4. Foreign direct investment (FDI) sources are increasingly shifting toward Asia.**

Although intra-Asian FDI flows have grown substantially in the last ten years, the medium and long-term sustainability of those flows is likely to depend on the recovery of trade, investment and financial capital flows within the region. While shorter distance between Asian countries facilitates bilateral FDI flows, there remains a need to lower sovereign risk, create transparent

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<sup>36</sup> UNCTAD database on FDI/TNC and cross-border M&As.

<sup>37</sup> See H. Wai-Chung Yeung, ed., *Handbook of Research on Asian Business*. London: Edward Elgar Publishing, January 7, 2007; Y. Luo, "Dimensions of knowledge: comparing Asian and Western MNEs in China", *Asia Pacific Journal of Management*, Vol. 16 (1), 1999; A. B. Sim, and J. R. Pandian, "Emerging Asian MNEs and their internationalisation strategies –Case study evidence on Taiwanese and Singaporean firms", *Asia Pacific Journal of Management*, 20:1, 2003.

<sup>38</sup> P. J. Kitchen and S. Z.Ahmad, "Outward investments by developing country firms: the case of emerging Malaysian corporations", *International Journal of Business and Management*, Vol. 2 (4), 2007.

<sup>39</sup> See, for example, Asian Development Bank, "Connecting East Asia: A New Framework for Infrastructure". Asian Development Bank, Japan Bank For International Cooperation, and World Bank. Tokyo, March 16, 2005; and P. Lloyd and P. Smith, "Global Economic Challenges to ASEAN Integration and Competitiveness: A Prospective Outlook". REPSF Project 03/006a. ASEAN Secretariat, September 2004.

<sup>40</sup> Hadi Soesastro, "Accelerating ASEAN Economic Integration: Moving Beyond AFTA". Economics Working Paper Series. Paper presented at the Second ASEAN Leadership Forum, Kuala Lumpur, 17 March 2005.

<sup>41</sup> Rafaelita M. Aldaba and Josef T. Yap, "Investment and Capital Flows: Implications of the ASEAN Economic Community", Discussion Paper Series No. 2009-01, Philippine Institute for Development Studies, January 2009.

and predictable regulatory environments, and lower corporate tax rates in host countries.<sup>42</sup> Technological developments affecting manufacturing and service industries, especially those in information technology, biotechnology, and new materials, are concentrated in the industrialized countries, and the Asian economies can benefit from a greater participation in those globally integrated production systems.<sup>43</sup>

**5. Asia's major stock market linkages to the major US and EU financial centers will likely continue to increase.**

Stock market indicators in Asia are highly correlated with the major financial centers in the United States and Europe. Moreover, there is evidence that Asian markets have become more integrated over time.<sup>44</sup> The extensive literature on emerging market linkages and co-movements with major financial centers generally underscore the importance of trade and financial ties as determinants of those linkages.<sup>45</sup> Some studies have suggested that, for the Asian emerging markets in particular, the existence of co-movements has given rise to contagion, which occurs when there are significant increases in co-movements after a shock to a country.<sup>46</sup> However, the existence of stock market contagion in the emerging markets of Asia has been found lacking, and there is little evidence that it occurred following the stock market collapse in September 2008.<sup>47</sup> There is also evidence that the large inflows of portfolio capital into developing Asia prior to the recent global financial crisis are not only associated with economic fundamentals in those countries, but also with the demand conditions in the stock markets of the major international financial centers.<sup>48</sup> The latter finding suggests that financial policies of the industrialized countries are as likely to affect portfolio capital inflows into Asia as are the economic fundamentals within those Asian countries. These findings generally point to the likelihood of a continued close relationship between developments in Asia's stock markets and

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<sup>42</sup> R. Hattari, R.S. Rajan, and S. Thangavelu, "Understanding Intra-Asean FDI Flows: Trends and Determinants and the Role of China and India." January 2008. Available: <http://www.freewebs.com/rrajan1/OFDIASEAN.pdf>

<sup>43</sup> D. Ernst, "Pathway to Innovation in Asia's Leading Electronics Exporting Countries: Drivers and Policy Implications". East-West Center Working Papers, No. 62, November 2003.

<sup>44</sup> L. Soenen, "Asian economic integration and stock market comovement". Journal of Financial Research. March 2002. Available: <http://www.allbusiness.com/business-finance/equity-funding-stock/178292-1.html>.

<sup>45</sup> See, in particular, M. Chinn, and Forbes, K., "A decomposition of global linkages in financial markets over time". *Review of Economics and Statistics* (86), 2004. For a recent review, see H. Chee-Wooi and G. Kim-Leng, "What Drive The Regional Integration Of Equity Markets?". Unpublished, 2009. Available: [www.sgvs.ch/congress09/upload/p\\_242.doc](http://www.sgvs.ch/congress09/upload/p_242.doc).

<sup>46</sup> For a summary, see Claessens, S., Dornbusch, R., and Park, Y. C. (2000). Contagion: How it spreads and how it can be stopped? Mimeo. Paper prepared for World Bank/IMF conference on Financial Contagion: How it Spreads and How it Can Be Stopped?. Available: <http://www1.worldbank.org/economicpolicy/managing%20volatility/contagion/documents/Claessens-Dornbusch-Park.pdf>.

<sup>47</sup> For empirical evidence, see K. Forbes and R. Rigobon, "No Contagion, Only Interdependence: Measuring Stock Market Co-movements". Unpublished, February 2008. Available: <http://www1.worldbank.org/economicpolicy/managing%20volatility/contagion/documents/NoContagion-Paper.pdf>. For an analysis of the transmission of the 2008 stock market crisis in the United States to developing Asia, see W.E. James et al, "The US Financial Crisis, Global Financial Turmoil, and Developing Asia: Is the Era of High Growth at an End?" ADB Economics Working Paper Series No. 139, December 2008. Note that the use of the term contagion in the latter study differs from the one for stock market contagion used in this section, which follows the study of K. Forbes and R. Rigobon (2008).

<sup>48</sup> V. FitzGerald, "International Risk Tolerance, Capital Market Failure and Capital Flows to Emerging Markets". Research Paper No. 2006/35. UN-WIDER. April 2006. The so-called economic fundamentals determining portfolio capital flows refer to the country risk versus returns of a country, while

those in the major international financial centers.

**6. *Pegged and managed exchange rates will continue to form part of the policy tools used in most Asian economies, notwithstanding the lessons from the Asian crisis.***

Most governments are likely to maintain either pegged or managed float of their currencies in an effort to reduce volatility in their exchange rates. The analysis of international currency linkages and exchange rate misalignments presented in Section III.E indicates that recent changes in the international competitiveness of the region's countries have been unfavorable to some countries, especially those whose currencies have strengthened against the US dollar. There is therefore concern that the appreciation of some currencies in terms of their real effective exchange rates relative to other Asian economies and key global markets. Those developments could push policymakers to adopt the types of exchange rate policies that were introduced after the Asian financial crisis, but were subsequently abandoned by most countries. The International Monetary Fund, in particular, has warned against "beggar-thy-neighbor" exchange rate management by the Asian economies, and encouraged policymakers to avoid protectionist measures.<sup>49</sup> Exchange rate management in the Asian economies is likely to persist, however, since most of the governments consider their existing 'managed float' exchange rate policies more conducive to national economic goals and objectives than freely floating exchange rate arrangements.

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<sup>49</sup> International Monetary Fund, "Asia and Pacific. Global Crisis: The Asian Context". Regional Economic Outlook. Asia and Pacific Global Crisis: The Asian Context. World Economic and Financial Surveys. May 2009b.

## IV. FORWARD LOOKING POLICY IMPLICATIONS

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### A. Rebalancing the Asian Economies

The current downturn in economic activity throughout Asia highlights the vulnerability of the export-led economic growth model to external shocks. This situation has engendered widespread interest in a rebalancing of the economies in a way that would shift export-driven growth to domestic demand-led growth. The fundamental question facing policymakers is how to rebalance growth in such a manner that reduces the region's external market dependence without negatively impacting on their economies during the transition process. According to the ADB's recent *Asian Development Outlook*, even though the optimal policy mix for rebalancing will differ across countries, there are a number of common policy areas that would strength domestic demand and redirect production activities.<sup>50</sup>

Specific policies to encourage a rebalancing of Asian economies can be separated into supply and demand-side policies. On the demand side, some of the initiatives commonly used by policymakers include (a) policies that shift corporate savings to household savings; (b) greater state provision of health care, education, and pension benefits to help mitigate the household risk and uncertainty and reduce precautionary savings; and (c) enhancing the regulatory climate for investment and expansionary fiscal policies that in the short run involve lower takes and greater government spending. In China, for example, the current lack of education and health expenditures explains the increase in saving rates to compensate for low government spending in those areas.<sup>51</sup> Improvements in the social safety net would reduce the need for households to save in order to self-insure against these risks, thereby reducing precautionary savings. Similarly, increasing public provision of education would help to lower household savings by reducing the need to accumulate assets to finance future education expenditures.<sup>52</sup>

On the supply side, common policies to promote a rebalancing include (a) providing access to the types of finance for SMEs and cross-border investments that more closely align production to domestic demand; and (b) moving away from tightly managed exchange rates to a more flexible exchange rate regime. As mentioned earlier, the liberalization of exchange rates could stimulate domestic consumption and thereby reduce dependence on foreign markets. While most governments are unlikely to depart from their managed exchange rate systems because of their preferences in managing exchange rate volatility and using the exchange rate as a policy tool for national economic goals and objectives, some liberalization of the exchange rates would enhance the use of monetary instruments targeting macroeconomic stability, which could, in turn, stimulate output and employment growth. In the financial sector, liberalization of the banking system and development of financial markets would help to reduce precautionary savings and thereby stimulate consumption. Without these reforms, the existence of underdeveloped financial systems in some of the Asian economies will continue to motivate firms to retain large amounts of their earnings as a means of compensating for the lack of alternative financing

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<sup>50</sup> Asian Development Bank, "Asian Development Outlook 2009". Manila, 2009. See also C. Adams and D. Park, "Causes and Consequences of Global Imbalances: Perspective from Developing Asia". ADB Economics Working Paper Series No. 157, April 2009.

<sup>51</sup> M. Chamon and E. Prasad, "Why Are Saving Rates of Urban Households in China Rising," *American Economic Journal: Macroeconomics*, NBER Working Paper No. 14546, 2009 (forthcoming).

<sup>52</sup> This and the material that follows draws from E.S. Prasad, "Rebalancing Growth in Asia". National Bureau of Economic Research. NBER Working Paper No. 14731, July 2009.

mechanisms.<sup>53</sup> Households would also benefit from the development of the financial sector by providing them with better opportunities for diversification of investments and improved returns on their savings. In this way, household would be able to reduce their need for precautionary saving and increase consumption expenditures.

Most of these policies require further study in terms of their applicability and adaptability to particular Asian economies. Among the critical factors to be considered in rebalancing the region's economies are (a) the appropriateness of consumption versus investment-led growth, which are likely to have important welfare implications in terms of employment absorption; (b) the ability of the private sector to lead growth versus the shorter timeframe needed for the government to generate domestic expenditure-led growth; (c) the implication of rebalancing policies on the composition of corporate and household savings; and (d) the employment generating consequences of consumption versus investment-led growth policies, as they affect the capital-output ratios of the economies. In general, policies promoting greater domestic consumption are favored over those encouraging investment, since Asia's widening current account surplus has been driven by high savings rates. This view is supported by the stronger evidence of over-saving than under-investment in the region, and stronger evidence of over-investment prior to the 1997 Asian crisis than under-investment after the Asian crisis.<sup>54</sup> These findings suggest that the key to rebalancing Asian growth toward domestic sources lies in promoting consumption rather than investment.

## **B. Liberalizing Trade and Investment Policy Regimes**

There is considerable scope for deepening trade liberalization within the ASEAN countries and broadening the coverage to other Asian countries as a means of strengthening the so-called 'domestic' regional economy. A larger regional bloc would promote scale economies and greater specialization in differentiated products, which would in turn expand intra-industry trade. Progress in moving from a free trade area to a customs union in ASEAN could also yield substantial producer and consumer welfare benefits for the region.<sup>55</sup> A customs union could stimulate cross-border production activities to target the increased demand for final goods and thereby increase the relative importance of final goods in intra-regional trade. In addition to the progress being made among the ASEAN+3 countries, there is a strong interest in expanding trade between Southeast Asia and South Asia through channels like the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), which aims to promote free trade within the region, increase cross-border investment and tourism, and promote technical cooperation among Bangladesh, India, Myanmar, Sri Lanka, Thailand, Bhutan and Nepal.

## **C. Liberalizing Exchange Rate Regimes**

Opportunities exist for countries to adopt more flexible exchange rate regimes and thereby enable a rebalancing based on the reallocation of resources from the production of tradables to non-tradables.<sup>56</sup> The prescription could become all the more appropriate if the US dollar were to

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<sup>53</sup> E.S. Prasad, "Rebalancing Growth in Asia". National Bureau of Economic Research. NBER Working Paper No. 14731, July 2009.

<sup>54</sup> D. Park and K. Shin, "Saving, Investment, and Current Account Surplus in Developing Asia". ADB Economics Working Paper Series No. 158, April 2009.

<sup>55</sup> See M. Lord, "Moving towards a Common External Tariff Regime in ASEAN". ASEAN Secretariat, Capacity Building for the ASEAN Secretariat: Common External Tariff Regime, December 2008.

<sup>56</sup> For example, Prasad and Setser (2009) argue that large inflows from Asia to the US were a factor in fuelling the boom in credit boom and asset prices, suggesting that one way to address this issue is for policymakers to refrain from exchange rate pegging policies that inevitably lead to such a pattern.

depreciate as part of an effort to reverse the global imbalance. Bosworth and Flaaen (2009) have calculated that the U.S. dollar would have to depreciate by as much as 30 percent in the long run for the US economy to successfully refocus its growth based on an export drive.<sup>57</sup> Under this scenario a neutral position on the part of the United States would not be sufficient for effectively rebalancing. The process has already begun with the dollar's gradual weakening since 2002. If that were to occur, many Asian currencies could experience a significant nominal and real exchange rate appreciation.<sup>58</sup> Lower relative prices would help to shift resources toward production for domestic use, raise household incomes and stimulate consumption. At current levels of the dollar, however, the continuing likelihood of that process of expenditure switching is unclear.<sup>59</sup> In the short run it is generally recognized that policymakers are unlikely to embrace these expenditure switching measures that shift demand between domestic goods and imports. Pressure to improve external competitiveness and promote exports is likely to remain strong. However, expenditure switching policies could become a long-term strategy in the context of rebalancing growth towards domestic sources.<sup>60</sup>

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<sup>57</sup> B. Bosworth and A. Flaaen, "America's Financial Crisis: The End of an Era". ADBI Working Paper Series, No. 142, July 2009.

<sup>58</sup> See Obstfeld, M. and K. Rogoff. "The unsustainable U.S. current account position revisited," Proceedings, Federal Reserve Bank of San Francisco, 2007.

<sup>59</sup> The estimates in this study estimates are based on aggregate data and a broader specification of the model could yield different results in terms of the importance of foreign import demand to the export performance of specific Asian countries. For country specific estimates, see See M. Lord "Modeling ASEAN Global Linkages". Manila, Asia Development Bank, 1999. For product grouping estimates, see Jongwanich, "Determinants of Export Performance in East and Southeast Asia". Manila, Asia Development Bank, ERD Working Paper No. 106, which suggested that diversification of exports away from traditional products and toward assembly and component parts within global industries have tended to weaken the link between the real exchange rate and Asia's export performance, and strengthened that of the link to world demand.

<sup>60</sup> See, for example, International Monetary Fund, "Regional Economic Outlook: Asia and the Pacific. Global Crisis: the Asian Context". Washington, DC, May 2009.

## V. CONCLUSION

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This paper has examined the empirical evidence on Asia's linkages and the challenges confronting the region's dependence on a global imbalance for its sustained growth. The evidence highlights the following characterizations about the region:

- ✓ First, Asia's business-cycle co-movements with the US and EU economies are large and will probably continue to impact on the region's economies in the future, albeit through more complex channels than in the past that are associated with the growth of portfolio flows, stock market volatility, and integrated production networks.
- ✓ Second, the traditional channels of international transmissions in the form of trade linkages with the United States and Europe has weakened as a result of shifts towards greater trade with intra-Asia markets, as well as the Middle East and Central Asia. However, the region's involvement in global production networks has meant that much of its output continues to be channeled to the US and EU markets.
- ✓ Fourth, FDI sources are increasingly shifting toward Asia, although technological developments affecting manufacturing and service industries remain concentrated in the industrialized countries. Despite sharp inward FDI declines in some Asian countries caused by the global economic slowdown, others like China, India, Indonesia, Malaysia and Vietnam have sustained their FDI inflows.
- ✓ Fifth, Asia's stock market indicators are highly correlated with the major financial centers in the United States and Europe, and those linkages will probably increase over the medium term. Nonetheless, explanations about the causality of those co-movements have yet to converge to a generally accepted explanation, which suggests that the form of those co-movements could alter as ongoing structural reforms in the financial markets take place.
- ✓ Finally, pegged and managed exchange rates form part of the policy tools used in most Asian economies, notwithstanding the lessons from the Asian crisis. It is unlikely that policymakers will readily adopt freely floating exchange rate arrangements as a means of rebalancing since they consider 'managed float' exchange rate policies more conducive to national economic goals and objectives.

The existence of continued linkages and the resulting co-movements that they create has important implications for the types of adjustments needed to rebalance the Asian economies on a sustainable basis. Policy prescriptions discussed in this paper are likely to involve difficult adjustment processes in the short to medium term, particularly as they impact on production and employment patterns. However, the establishment of a strong foundation for growth will likely produce desirable outcomes for a broad range of activities and areas, including intra-regional trade and investment, social welfare services, SME financing, and the regulatory environment.

## ANNEX A: Technical Notes

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Our estimates of the international transmission of income and other changes on the ASEM countries separate the long-run or equilibrium relationships between domestic income and foreign income, prices and other variables from the short-run or dynamic disequilibrium components of those relationships. We examine global linkages of the ASEM countries using an error-correction mechanism (ECM) specification that provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. The ECM adjusts for any disequilibrium between variables that are cointegrated. As a result, it provides the means by which the short-run observed behavior of variables is associated with their long-run equilibrium growth paths. A closely related specification known as the “error-correcting mechanism” (also having the acronym ECM) models both the short and long-run relationships between variables.

To illustrate the adjustment process of these transmissions, we can estimate the simple relationship of real GDP growth of all ASEAN-5 countries to changes in real GDP growth in all the global regional economies (Japan plus US plus EU). Let the variable  $Y$  represent the real GDP growth of the ASEAN-5 and  $Z$  represent the real GDP growth of the global regional economies. The resulting estimate of the ECM relationship between these two variables is as follows:

$$\Delta y_t = -1.77 - \underset{(2.4)}{0.11}(y - z)_{t-1} + \underset{(2.7)}{0.51}\Delta z_t + \underset{(2.4)}{0.14}z_{t-1} \quad (\text{A.1})$$

$$R^2 = 0.83 \quad dw = 1.3 \quad SE = 0.014$$

where lower-case letters denote the logarithms of the corresponding capitals, the t-statistics are shown in parentheses,  $R^2$  is the corrected squared multiple correlation coefficient,  $dw$  is the Durbin-Watson statistic, and  $SE$  is the standard deviation of the residuals.

The estimated equation yields a short-term elasticity of 0.51 long-run elasticity of 2.27 ( $= 1 + 0.14/0.11$ ) with respect to real GDP of the global regional economies. The growth rate of the selected global regional economies is given by  $\Delta z$ , whose steady-state path can be denoted  $g$ . A constant growth rate of  $g = \Delta z$ , yields the long-run dynamic relationship:

$$Y = kZ^{2.27} \quad (\text{A.2})$$

where  $k = \exp\{[-1.77/-0.11] + [-0.11 - 0.51 \times (-0.11) - 0.14]/-0.11^2\}g = \exp(16.09 - 16.02)g$ . Since  $g = 2.8$  percent was the average growth rate of real GDP in the global regional economies during the period 1971-98, then  $k = 0.03$  and the ratio of real GDP of the ASEAN-5 to that of the selected global regional economies equals 1.68 percent, which approximates the average ratio in 1971-98. The ASEAN-5's real GDP growth is therefore shown to be influenced by changes in both the level and rate of growth of real GDP in the global regional economies.

Table A.1 presents the estimates for the ASEM countries' GDP relationship to foreign income, while Table A.2 includes estimates for not only foreign income, but the commodity terms of trade, imports by the G7 countries and net private capital flows.

**Table A.1: Regression Results of ASEM Members' GDP Relationships to Foreign Income**

$$\Delta y_t = a_0 + a_1(y - z)_{t-1} + a_2\Delta z_t + a_3z_{t-1} + v_t$$

						Summary Statistics			
Country or Grouping	Global Regions	$\ln(Y/Z)_{t-1}$	$\Delta \ln(Z)_t$	$\ln Z_{t-1}$	Const	R <sup>2</sup>	dw	SE	dof
ASEAN a/ c/	US plus EU	-0.06 (2.1)	0.94 (3.6)		-0.19	0.86	1.40	0.02	16
China	US plus EU	-0.07 (1.8)	0.56 (1.7)	0.10 (1.5)	1.14	0.30	1.42	0.03	17
India d/	US plus EU	-0.06 (1.8)	0.26 (1.7)	0.10 (1.5)	-0.99	0.57	1.25	0.01	24
OTHER ASEM a/	US plus EU	-0.22 -2.9	0.86 (4.7)	-0.12 (4.3)	0.9	0.82	1.53	0.01	20

Notations (lower-case letters denote logarithms of upper-case letters):  
Y = Domestic GDP  
Z = Foreign GDP  
a/ Includes a binary variable for 1998 (1 in 1998; 0 otherwise).  
b/ Includes a binary variable for 1999 (1 in 1999; 0 otherwise).  
c/ Includes a binary variable for 1991 (1 in 1991; 0 otherwise).  
d/ Includes a binary variable for 2000 (1 in 2000; 0 otherwise).  
Notes: R<sup>2</sup> is the adjusted R<sup>2</sup>; figures in parentheses below the coefficients are t-statistics.

**Table A.2: Regression Results of ASEM Members' GDP Relationships to Foreign Income, Commodity Prices, G7 Imports, and Private Capital Flows**

$$\Delta y_t = a_0 + a_1(y - z)_{t-1} + a_2\Delta z_t + a_3z_{t-1} + \alpha_6\Delta W_t + \alpha_7W_{t-1} + \alpha_8\Delta Q_t + \alpha_9Q_{t-1} + \alpha_{10}\Delta d_t + \alpha_{11}d_{t-1} + \alpha_{12}\Delta k_t + \alpha_{13}k_{t-1} + v_t$$

											Summary Statistics				
Country or Grouping	Global Regions	$\ln(Y/Z)_{t-1}$	$D\ln(Z)_t$	$\ln Z_{t-1}$	$D\ln(W)_t$	$\ln W_{t-1}$	$D\ln(Q)_t$	$\ln Q_{t-1}$	$D\ln(D)_t$	$\ln D_{t-1}$	Const	R <sup>2</sup>	dw	SE	dof
ASEAN	US plus EU	-0.4 (2.9)				0.11 (1.7)	0.39 (3.4)	0.25 (2.4)	0.4 (10.9)	0.5 (9.2)	-2.4	0.95	2.30	0.01	16
China	US plus EU	-0.18 (1.7)		0.07 (1.8)		0.15 (2.2)				0.01 (2.2)	-1.98	0.68	1.63	0.01	12
India d/	US plus EU	-0.06 (1.8)	0.26 (1.7)	0.10 (1.5)							-0.99	0.57	1.25	0.01	24
OTHER ASEM a/	US plus EU	-0.12 (3.7)			0.09 (1.9)	0.04 (2.0)	0.16 (1.9)	0.02 (2.8)	0.009 (2.8)	0.009 (1.8)	-0.73	0.83	1.5	0.01	13

Notations (lower-case letters denote logarithms of upper-case letters):

Y = Domestic GDP

Z = Foreign GDP of US and EU

W = Commodity terms of trade (i.e., non-fuel commodity price index relative to manufactured unit value index)

Q = Import volume of G7 industrialized countries

D = Developing Asia net private capital flows

Notes: R<sup>2</sup> is the adjusted R<sup>2</sup>; figures in parentheses below the coefficients are t-statistics.

The final estimate is for the ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) with the real effective exchange rate included in the relationship. The results are as follow:

$$\begin{aligned} \Delta y_t = & -1.28 - 0.18(y - z)_{t-1} + 0.35\Delta z_t + 0.06z_{t-1} - 0.07r_{t-1} + 0.02\Delta d_t \\ & + 0.03d_{t-1} + 0.12\Delta q_t + 0.02q_{t-1} + v_t \end{aligned} \quad (A.3)$$

$R^2 = 0.99 \quad dw = 2.7 \quad SE = 0.004$

Where Y = Domestic GDP, Z = Foreign GDP of US and EU, W = Commodity terms of trade (i.e., non-fuel commodity price index relative to manufactured unit value index), Q = Import volume of G7 industrialized countries, D = Developing Asia net private capital flows, and R = Real effective exchange rate of the ASEAN-5 countries, trade weighted by their respective GDP shares.

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