

## Trade Patterns in East Asia: Implications for the Debate on Mega-FTA Initiatives \*

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### Abstract

This paper documents and analyzes emerging trade patterns in Asia, with special reference to the implications of the development of global production sharing with a view to informing the contemporary policy debate on forming two mega-FTA initiatives, Trans-Pacific Partnership (TPP) and Regional Comprehensive Economic Partnership (RCEP). The analysis reveals that the degree of dependence of these countries on this new form of global division of labour in East Asia is much larger compared to Europe and North America. Global production sharing has certainly strengthened economic interdependence among the countries in the region, but the dynamism of the regional cross-border production networks depends inexorably on global, rather than regional, trade in final goods. The findings of this paper make a strong case for a global, rather than a regional, approach to trade and investment policy making.

### 1. Introduction

The purpose of this paper is to document and analyze the emerging patterns of international trade in Asia, with a view to informing the contemporary debate on two mega-FTA

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initiatives, namely Trans-Pacific Partnership (TPP) and Regional Comprehensive Economic Partnership (RCEP). The paper aims to add new insight into the sizeable existing literature on this subject by examining the implications of the on-going process global production sharing the breakup of the production processes into geographically separated stages<sup>1</sup> for understanding the on-going process of economic integration in the region.

It is widely help in policy circles that Asia, in particular East Asia, has become increasingly integrated through trade and investment over the year through the expansion of manufacturing exports. This view is rooted in the ‘standard’ trade data analysis which is based on the conventional notion of horizontal specialization that trade takes place in the form of final goods, goods that are produced from start to finish in a given country. It has largely ignored the ongoing process of global production sharing and the resulting trade complementarities among countries involved in this form of international exchange. Global production sharing opens up opportunities for countries to specialize in different slices (different tasks) of the production process depending on their relative cost advantage and other relevant economic fundamentals. Consequently, parts and components are now exchanged across borders at a faster rate than final goods. In this context, the decisions of how much to produce and for which markets have to be combined with decisions of where to produce and with what degree of intra-product specialisation. Trade flow analysis based on data coming from a reporting system designed at a time when countries were trading only in final goods naturally distorted values of exports and imports leading to a falsification of the degree of intra-regional trade integration. The degree of falsification is likely to increase over time as more complex production networks are created with an ever increasing number of interacting countries (Jones and Kierzkowski 2001a, 2001b). An analysis based on the standard trade data also tends to overlook the link between emerging patterns of trade and foreign direct investment, which is vital for assessing the implications of

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<sup>1</sup>In the recent literature on international trade an array of alternative terms have been used to describe this phenomenon, including ‘international production fragmentation’, ‘vertical specialisation’, ‘slicing the value chain’ and ‘outsourcing’.

exchange rate policy for the growth dynamism of countries whose manufacturing performance is enmeshed in global production networks.

For the purpose of the study Asia is defined to encompass the economies of South and East Asia. East Asia includes Japan, and developing East Asia (DEA), which covers the newly industrialized economies (NIEs) in North Asia (South Korea, Taiwan and Hong Kong), China and members of the Association of Southeast Asian Nations (ASEAN). Developing Asia (DA) refers to South and East Asia except Japan. Hong Kong and China are treated as one geographical entity, while reporting data separately for the two economies for comparative purposes. This is justified not only because Hong Kong was reverted back to Chinese sovereignty, but also because the two economies have increasingly been closely interlinked through trade and investment following China's market oriented reform initiated in the late 1970s. To gain perspectives, the Asian experience is examined in the wider global context.

The paper is set out as follows. Section 2 examines trends and patterns of trade over time in aggregate and by major commodity groups, paying particular attention to the phenomenon of 'network trade' based on global production sharing. Central to the discussion in this section is the implications of network trade for the relative importance of intra-regional versus global economic integration. Section 3 examines the possible implications of TPP and RCEP for East Asia's engagement in global production network. The final section summarizes the key findings and draws out some general inferences.

## 2. Trade Patterns

The analysis in this section is based on data compiled from the UN *Comtrade* database. In order to assess the magnitude and nature of trade within global production networks, it is necessary to separate parts and components (henceforth referred to as ‘components’ for brevity) from final (assembled) products in reported trade data. We do this through a careful disaggregation of 5-digit level data based on the Revision 3 of the Standard International Trade Classification (SITC, Rev 3) of the United Nation trade data reporting system. Revision 3, which was introduced in the mid-1980s, marked a significant improvement over Revision 2. In addition to redressing the issue of overlap within SITC 7, it provided for the separation of parts and components trade in the miscellaneous goods sector (SITC 8). For the purpose of analyzing overall trade trends and changes in commodity composition over long time horizon, we combine the data reported under the Revisions 2 and 3 of the Standard International Trade Classification (SITC) for the period from 1980 to 2011. The separation of components from reported trade data is however possible only from 1992 when almost all countries reporting to the UN trade system had adopted the revised reporting system.

The data are tabulated using importer country records, which are considered more appropriate compared to the corresponding reporter records for analyzing trade patterns for a number of reasons (Ng and Yeats, 2003, Appendix 1; Feenstra *et al.*, 2005). Importer records are admittedly less susceptible to double counting and erroneous identification of the source/destination country in the presence of entrepot trade compared to data based on reporting country records (e.g., China’s trade through Hong Kong and Indonesia’s through Singapore). Also, some countries fail to properly report goods shipped from their own export processing zones. These exports are simply lumping these exports into one highly aggregated category of ‘special transactions’ under SITC 9. In order to achieve comparability across countries, data on oil and gas trade (SITC 3) are excluded from the coverage of merchandise trade. The data are used in current US\$ terms.

Over the past half a century, Asia emerges as the third hub of world trade next to Europe and North America. The combined share of Asian countries in world non-oil exports recorded a three-fold increase over the past three decades, from 11.1% to 37.1%, between 1979-80 and 2010-11<sup>2</sup> (Table 1). The region accounted for over 40% of total increment in world exports over this period. East Asia dominated this impressive export growth story, accounting for over 95% of the total regional trade. By 2010-11, East Asia share in world trade was nearly three times of that of the North America Free Trade Area (NAFTA) (13.4%) and slightly higher than that of EU-15 (34.8%).

In the 1960s and 1970s, Japan dominated the region's trade, accounting for over half of total exports and imports. Next came the four 'Tigers': Korea, Taiwan, Hong Kong and Singapore. Over the past two decades the rise of China has been the dominant factor behind this structural shift in world trade in favour of Asia. Clearly, the rise of China together with a continued increase of the other countries' world market share suggests that there is no indication of China 'crowding out' its neighbours.

Within East Asia, the combined world export share of ASEAN countries increased persistently from 2.0% in 1979-80 to 7.2% in 2010-11, but these countries still account for less than a fifth of total Asian trade. Notwithstanding some export expansion in recent years, South Asia still accounts for a mere 2.0% of total world trade, equivalent to less than 5% of Asia's total trade. In 1979/80 China's world export share (1%) almost at par with that of India (0.6%), but was more than 7 times larger in 2005/6 (India: 1.6%, China 12.8%)

Rapid export growth in Asia, mainly driven by the DEA group, has been underpinned by a pronounced shift in export structure away from primary commodities and toward

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<sup>2</sup> Hereafter, we will use the terms 'total world exports/trade' and 'total world non-oil exports/trade' interchangeably and to mean the same thing. Trade and investment magnitudes throughout the paper are measured in current US dollars unless otherwise indicated. Throughout the paper inter-temporal comparison calculations are made for the two-year averages relating to the end points of the period under study so as to reduce the impact of year-to-year fluctuations of trade flows.

manufactures (Table 1). By 2010/11 manufactures accounted for 89.1% of total exports from Asia, up from 54.4% three decades ago. Given the nature of their resource endowments, Japan and the four Asian NIEs (Hong Kong, Taiwan, Korea, and Singapore) relied very heavily on manufacturing for export expansion from the very beginning. However, beginning in the 1970s, a notable shift towards manufacturing is observable across all countries, at varying speeds and intensity. Among individual countries Indonesia and Vietnam, (and of course the very small late-comer Indo China economies) have a significantly lower share of manufactures in their exports, reflecting both their comparative advantage and their later adoption of export-oriented industrialization strategies.

Within manufacturing, machinery and transport equipment (SITC 7) (henceforth referred to as 'machinery'), in particular information and communication technology products (ICT) therein, have played a pivotal role in this structural shift. The share of machinery and transport equipment in total manufacturing exports from Asia increased from 40.3 % in 1979/80 to 58.9% in 2005/06, with DEA accounting for over four-fifths of the increment. In 2010-11 ICT products accounted for almost three fourth total machinery exports from these countries. The level and the change over time of world market shares in this product category among the Asian countries are strikingly similar to that of ICT products. Among the developing Asian countries, only Thailand has recorded notable increase in exports of motor vehicles (Table 2).

East Asia become an export hub in the world. Countries in the region accounted for 57.8% of total world ICT product exports in 2010-11; China alone accounting for 22.8% (Table 3). Electrical goods are the next major item of manufacturing exports. Asia's share in world exports of the other main product categories has also increased overtime, though at a slower rate. Of particular interest here is the notable increase in region's shares in textile and wearing apparel (SITC 8). China has accounted for much of this increase but, in contrast to ICT exports, the geographic participation has been broader. A number of low-wage countries in Southeast and South Asia, including Indonesia, Vietnam, India, Sri Lanka, Bangladesh, and Cambodia (the

latter included under ‘Other ASEAN countries’) have all recorded impressive gains in market share of wearing apparel.

The fast growth of machinery trade, in particular trade in ICT products and electrical goods, has been driven by the ongoing process of global production sharing and the increasingly deep integration of East Asian countries into the global production networks. Components and final (assembled goods) traded within global production networks (henceforth referred to as ‘network trade’) increased from US\$ 1,207 billion (about 23.8% of total manufacturing exports) in 1992-1993 to US\$ 4,850 billion (45.7%) in 2007-2008, accounting for nearly two-thirds of the total increment in world manufacturing exports during this period.<sup>3</sup> This increase was underpinned by a palpable shift in global production sharing away from mature industrial economies toward developing countries and in particular toward East Asia. The share of developing countries in total network exports increased from 22.0% in 1992-93 to 46.1% in 2007-2008, driven primarily by the growing importance of East Asian countries in global production sharing. The share of East Asia (including Japan) increased from 32.2% in 1992-1993 to 40.3% in 2007-2008, despite a notable decline in Japan’s share, from 18.4% to 9.5%. The major driving force has been China, whose share increased from 2.1% to 15.3%. Within East Asia, world market shares of ASEAN countries, with the exception of Singapore, have grown faster than the regional average. The mild decline in Singapore’s share reflects a marked shift in its role in global production networks for high-tech industries away from the standard assembly and testing activities to oversight functions, product design, and capital and technology-intensive tasks in the production process. Some, if not most, of these new activities are in the form of services and are, therefore, not captured in merchandise trade data (Wong 2007; Athukorala 2008).

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<sup>3</sup> The time coverage on data used in this and the following sub-section is from 1992-03 to 2007-08. As already noted, 1992 is the year for which Comtrade database provides a reasonable coverage of parts & components traded within global production networks. The years 2009 to 2011 are excluded to allow for distortions in patterns of network trade caused by the global financial crisis.

Table 4 presents comparative statistics on the share of network trade in total manufacturing exports and imports at the country and country group levels. It is evident that the share of network trade is much higher in East Asia than in all other regions of the world. In 2007-2008, exports within production networks accounted for over 60% of total manufacturing trade in East Asia, compared to the world average of 51%. Within East Asia, ASEAN countries stand out for their heavy dependence on production fragmentation trade, which is a critical part of their export dynamism. In 2007-2008, network exports accounted for over two-thirds of total manufacturing exports in ASEAN, up from 57% in the early 1990s. The patterns observed on the export and import sides of the ASEAN are strikingly similar, reflecting growing cross-border trade within production networks.

### **3. Implication for Ongoing Debate on Mega-FTA Initiatives**

There is ongoing debate concerning the establishment of two competing mega-regional consolidations, Trans-Pacific Partnership (TPP) and Regional Comprehensive Economic Partnership (RCEP), in which many East Asian economies involve. Proposed in 2006, TPP is aimed to be a high-quality, 21<sup>st</sup> century FTA in terms of negotiation coverage (tariff and beyond) as well as commitment. It was initially launched by Chile, New Zealand Brunei and Singapore. The participation of the US in 2008 made the agreement more attractive to countries in the Asia-Pacific region. The number of participant countries had increased to 12 by 2013 with Australia (2008), Peru (2008) Vietnam (2008), Malaysia (2010), Japan (2011), Mexico (2012) and Canada (2012) joining the negotiation process. During the US President Visit to Thailand in November 2012, Prime Minister Yingluck Shinawatra expressed interest to join TPP (Kohpaiboon and Jongwanich, 2014). South Korea is considering the Trans-Pacific Partnership (TPP), but will

give priority to concluding the bilateral free trade agreement with China.<sup>4</sup> In 2011, ASEAN took the initiative to consolidate its bilateral FTAs with 6 non-member countries including PRC China, India, Japan, Korea, India, Australia and New Zealand to form an AEAN-centred mega FTA, labeled the Regional Comprehensive Economic Partnership (RCEP). The members of RCEP are the ten ASEAN members, Japan, Korea, PRC China, Australia, New Zealand, and India.

A striking feature of the two mega FTA is the overlapping membership. Singapore, Brunei, New Zealand, Australia, Vietnam, Malaysia and Japan are members of both TPP and RCEP. In terms of overlapping membership, the only exceptions are China and India which belong only to RECEP, and the US which is only in TPP. The negotiation topics in both FTAs go beyond tariff liberalization, particularly in TPP. These other (non-tariff) issues like technical barriers to trade, investment agreement are to a large extent relevant for the global production network but negotiation details are not available when the paper is written. In the following discussion we, therefore, focus only on tariff liberalization that has a direct bearing on network trade.

The contemporary policy debate on the economic gains from the two mega FTAs is informed largely, if not solely, by the standard trade flow analysis which point to a significant increase in trade among the member countries over the past three decades. This approach to trade flow analysis is based on the implicit assumption of horizontal specialization, that is international trade is an exchange of goods that are produced from start to finish in just one country, which runs counter to the rapid growth of trade based on global production sharing.. If we look at trade patterns based on this assumption, increase in intra-regional trade in East Asia from about the early 1980s seems to suggest that RCEP would be more beneficial to East Asian

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<sup>4</sup> South Korea is considering the Trans-Pacific Partnership (TPP), but will give priority to concluding the bilateral free trade agreement with China (International Business Time (2014), 13 January 2014; <http://www.ibtimes.com/south-korea-considering-trans-pacific-partnership-tpp-will-prioritize-bilateral-free-trade-agreement>. Download on 26 March 2014).

countries compared to TPP. However, our discussion on the emerging patterns of network trade in the previous section yields the opposite inference for two reasons.

First, intra-regional trade in East Asia has been driven predominantly by trade in components traded within production networks trade (Table 5). Components account for a much larger share of intra-regional trade in East Asia compared to these countries world trade and trade with the EU and NAFTA. Moreover, the share of components in total imports is much larger than in exports and has increased at a faster rate. This reflects the fact that the region relies more on the rest of the world as a market for final goods than as a market for components. Within East Asia, ASEAN countries stand out for the high share of components in their intra-regional trade flows. The share of components in total intra-regional exports in ASEAN countries increased from 22.7% in 1992-1993 to 44.2% in 2007-2008. On the import side, the increase was from 36.0% to 47.8%. According to country-level data (not reported here, for brevity)<sup>5</sup>, the share of components in manufacturing exports and imports amounted to more than four-fifths in Singapore, Malaysia, and the Philippines and over two-thirds in Thailand. Korea and Taiwan are also involved in sizable trade in components with other countries in the region.

Second, the conventional trade flow analysis can yield an unbiased picture of regional economic integration only if component trade and final trade follow the same geographic patterns. Since component trade has a distinct intra-regional bias as already noted, then the conventional trade flow analysis is bound to yield a misleading picture in regard to the relative importance of intra-regional trade versus global trade for growth dynamism in the region. This is because growth based on assembly activities depends on the demand for final goods, which in turn depends on extra-regional growth.

Table 6 presents intra-regional trade shares estimated separately for total manufacturing trade, component trade, and final manufacturing trade (that is, total manufacturing trade less component trade). The table covers trade in East Asia and its sub-regions, which relate to contemporary Asian policy debates on regional integration. Data for NAFTA and the EU are

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<sup>5</sup> Data are available upon the authors' request.

reported for comparative purposes. Estimates are given for total trade (imports + exports) as well as for exports and imports separately to illustrate possible asymmetry in trade patterns resulting from East Asia's increased engagement in fragmentation-based international exchange. Trade patterns depicted by the unadjusted (standard) trade data affirm the received view that Asia, in particular East Asia, has become increasingly integrated through merchandise trade.

In 2007-2008, intra-regional trade accounted for 55.2% of total manufacturing trade in East Asia, up from 53.2% in 1992-1993. The level of intra-regional trade in East Asia was higher than that of NAFTA throughout this period and was rapidly approaching the level of the EU. For DEA and ASEAN, the ratios are lower than the aggregate regional figure, but they have increased at a much faster rate. The intra-regional trade share of ASEAN has been much lower compared to the other two sub-regions. This asymmetry in intra-regional trade in East Asia reflects the unique nature of the involvement of Japan and the PRC in regional production networks. From about the late 1980s, Japan's manufacturing trade relations with the rest of East Asia have been predominantly in the form of using the region as an assembly base for meeting demand in the region and, more importantly, for exporting to the rest of the world (Athukorala and Yamashita 2008). The emergence of the PRC as a leading assembly center within regional production networks since the early 1990s further amplified this trade asymmetry. That is, the PRC is importing parts and components from the other East Asia countries to assemble final products, which are predominantly destined for markets in the rest of the world (Athukorala 2009).

The picture changes significantly when component trade is netted out: the share of intra-East-Asian final trade (total trade—parts and components) in 2007-2008 was 44.2%, down from 50.3% in 1992-1993. The estimates based on unadjusted data and data on final trade are vastly different for East Asia, particularly for DEA and ASEAN. Both the level of trade in the given years and the change over time in intra-regional trade shares are significantly lower for estimates based on final trade. Interestingly, we do not observe such a difference in estimates for NAFTA and the EU.

The intra-regional shares calculated separately for imports and exports clearly illustrate the risk of making inferences about regional trade integration based on total (imports + exports) data. There is a notable asymmetry in the degree of regional trade integration in East Asia. Unlike in the EU and NAFTA, in East Asia the increase over time in the intra-regional trade ratio (both measured using unadjusted data and data for final trade) has emanated largely from a rapid increase in intra-regional imports as the expansion in intra-regional exports has been consistently slower. The dependence of East Asia (and East Asian country sub-groups) on extra-regional markets, in particular those in NAFTA and the EU, for export-led growth is far greater than is revealed by the standard intra-regional trade ratios commonly used in the debate on regional economic integration. For instance, in 2007-2008 only 43.9% of total East Asian manufacturing exports were absorbed within the region, compared to an intra-regional share of 64.4% in total manufacturing imports. For DEA, the comparable figures were 33.5% and 46.7%, respectively. This asymmetry is clearly seen across all sub-regions within East Asia. The asymmetry between intra-regional shares of imports and exports is therefore much sharper when components are netted out. This is understandable given the heavy component bias in Asian intra-regional trade and the multiple border-crossing of parts and components within regional production networks. On the export side, the intra-regional share of final goods declined continuously from 46% in 1992-1993 to 37% in 2007-2008, whereas the intra-regional import share increased from 55.4% to 63% between these two time points. The observed asymmetry in intra-regional trade in East Asia reflects the unique nature of the involvement of Japan and the PRC in regional production networks.

What are the implications of these findings for the contemporary policy debate on the two competing mega-FTA proposals. In particular, is the newfound fondness of countries in the region for RCEP consistent with the objective of maximizing gains from the ongoing process of international product fragmentation? Our analysis vividly demonstrate that even though the intra-regional trade gains its relative importance, global trade remains important for growth dynamism in the region remains important. In particular, growth based on assembly activities in

the region depends on the demand for final goods, largely depending on the extra-regional growth. This dependence has in fact increased over the years.

In theory, RCEP has a potential to lower any existing tariffs on products traded in the network and enhance the final good's competitiveness. This is especially true for network trade that is postulated to be relatively more sensitive to tariff changes than the final trade (or total trade as captured in published trade data) (Yi 2003).<sup>6</sup> However, in reality, much would depend on the nature of rules of origin built into FTAs. Trade-distorting effects of rules of origin are presumably more detrimental to fragmentation-based trade than to conventional final-goods trade, because of the inherent difficulties in defining the 'product' for duty exemption and because of the transaction costs associated with the bureaucratic supervision of the amount of value added in production coming from various sources. Even small differences in ROOs among criss-crossing FTAs can raise business costs and divert trade and associated investment. Those costs seem substantial and become hurdles for firms to apply for preferential trade schemes. Reflecting these complications, the actual utilization rates of tariff concessions provided under the existing FTAs have so far been rather low, ranging from about 5% to 20% across different product categories (Takahashi and Urata 2008, Kawai and Wignaraja 2009, Athukorala and Kohpaiboon 2011). Given the importance of extra-regional market for final goods for the growth dynamism of production networks in Asia, maintaining barriers to trade against non-members (while allowing free trade among members) can thwart 'natural' expansion of fragmentation-based trade across countries.

Even though TPP includes US, the main source of extra-regional growth dynamism, it does not necessarily imply that TPP would be a better option for the countries in East Asia

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<sup>6</sup> Normally a tariff is incurred each time a good-in-process crosses a border. Consequently, a one percentage point reduction in tariff leads to a decline in the cost of production of a vertically integrated good by a multiple of this initial reduction, in contrast to a 1 per cent decline in the cost of a regular traded good. Tariff reduction may also make it more profitable for goods that were previously produced entirely in one country to become vertically specialised. Consequently, in theory, the trade-stimulating effect of FTAs would be higher for trade in parts and components than for normal trade, other things remaining unchanged.

compared to unilateral or global (WTO-based) trade liberalisation. The trade-stimulating effect of TPP could be even smaller compare to RCEP mainly because the member coverage of TPP does not include China, the key player in the regional production network.

For a small economy like Thailand, participating in both TPP and RCEP in order to maximize the country coverage could not fix the detrimental effect that might have from using FTA privileges. Products that are eligible for preferential scheme in one FTA are not necessarily for the other. This is especially true at the current stage of both FTAs where China is not a member in TPP and the US is not included in RCEP.

#### **4. Conclusion and Policy Implication**

Global production sharing has become an integral part of the economic landscape of East Asia. Trade in parts and components has been expanding more rapidly than conventional final-good trade. The degree of dependence on this new form of international specialization is proportionately larger in East Asia compared to North America and Europe. A highly important recent development in international fragmentation of production has been the rapid integration of China into the regional production networks. China's imports of components from countries in ASEAN and other developing East Asia countries have grown rapidly, in line with rapid expansion of manufacturing exports from China to extra-regional markets, mostly to North America and the European Union.

The evidence harnessed in this paper supports the view that, in a context where global production sharing is becoming the symbol of economic globalization, the standard trade flow analysis leads to misleading inferences about the patterns and degree of trade integration among nations. Booming trade in parts and components has resulted in a rapid increase in intra-regional trade in East Asia, both including and excluding Japan. This does not, however, mean that the process has contributed to lessening the region's dependence on the global economy. On the contrary, the region's growth dynamism based on vertical specialisation is deeply dependent on its extra-regional trade in final goods, and this dependence has in fact *increased* over the years.

Put simply, increased participation in global production sharing has made the East Asia region increasingly dependent on extra-regional trade for its growth dynamism. Policy initiatives in the domain of financial (or trade) integration run the risk hindering growth dynamism of these countries unless this new dimension of global integration is not specifically taken into account.

To benefit from the new opportunities for trade expansion through the fragmentation-based division of labour, the best and the policy choice appears to be non-discriminatory multilateral and unilateral liberalization; the ongoing process of product fragmentation seems to have strengthened the case for a global, rather than a regional, approach to trade and investment policymaking. An effective approach to redressing the complexity that the ‘spaghetti bowl’ of FTAs create for international trade would involve a two-pronged stage of systematically fitting the FTAs into the WTO system and reducing the distortionary preference margins created by FTAs through multilateral tariff reduction. The Information Technology Agreement which came into force in 1997 is a promising start in achieving the latter objective.

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**Table 1 Asia in World Trade (%)**

Country/country group <sup>1</sup>	Total exports <sup>2</sup>				Manufacturing exports <sup>3</sup>				Manufacturing share in total exports			
	1979/80	1989/90	2005/6	2010-11	1997/80	1989/90	2005/6	2010-11	1979/80	1989/90	2005/06	2010-11
<i>Asia</i>	17.3	24.7	31.3	37.1	12.9	27.5	35.0	41.2	54.4	89.7	91.9	89.1
<i>East Asia</i>	16.5	23.8	29.9	35.1	12.0	26.7	33.7	39.1	53.0	90.4	92.6	89.4
Japan	8.6	10.4	6.5	5.9	8.9	12.7	7.6	6.1	75.5	98.4	96.1	83.0
<i>Developing East Asia</i>	7.9	13.4	23.3	29.2	3.1	14.0	26.1	33.0	28.6	84.2	92.0	90.7
China	1.0	2.9	11.6	12.8	0.5	3.0	13.4	15.3	36.5	83.3	94.9	95.9
Hong Kong	1.1	1.7	0.7	3.2	1.3	2.0	0.7	3.7	86.2	94.8	82.2	92.8
Korea	1.2	2.2	3.0	3.5	0.3	2.6	3.5	4.2	18.2	95.2	95.9	96.3
Taiwan	1.6	2.7	1.9	2.5	0.6	3.1	2.2	3.2	27.3	92.5	95.1	98.2
ASEAN countries	3.0	3.9	6.1	7.2	0.4	3.3	6.2	6.6	9.7	68.2	83.5	73.6
Indonesia	0.5	0.5	0.9	1.1	0.0	0.4	0.7	0.6	0.0	64.4	63.9	43.8
Malaysia	0.9	1.0	1.7	1.3	0.1	0.7	1.8	1.3	8.1	56.4	87.0	80.3
Philippines	0.5	0.3	0.7	0.4	0.1	0.3	0.7	0.3	14.6	80.6	82.2	60.2
Singapore	0.5	1.1	1.3	2.3	0.1	1.3	1.5	2.5	14.6	95.2	94.8	87.2
Thailand	0.5	0.8	1.3	1.5	0.1	0.6	1.3	1.4	14.6	60.4	82.2	74.9
Vietnam	---	---	0.3	0.6	---	---	0.3	0.5	---	--	82.2	66.9
<i>South Asia</i>	0.9	0.9	1.4	2.0	0.9	0.8	1.3	2.0	54.8	71.5	74.4	76.6
India	0.6	0.6	1.0	1.6	0.7	0.5	1.6	1.6	57.9	71.5	77.8	78.2
Sri Lanka	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	22.8	62.2	75.7	74.3
Bangladesh	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.2	65.2	78.4	78.2	77.2
Pakistan	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	54.4	71.8	75.2	74.3

continued

**Table 1 (Continued)**

Country/country group <sup>1</sup>	Total exports <sup>2</sup>				Manufacturing exports <sup>3</sup>				Manufacturing share in total exports			
	1979/80	1989/90	2005/6	2010-11	1997/80	1989/90	2005/6	2010-11	1979/80	1989/90	2005/06	2010-11
NAFTA	18.4	17.5	14.6	13.4	24.1	16.2	14.6	13.0	95.5	74.6	82.2	77.9
EU15	42.0	41.1	35.2	34.8	53.4	42.2	35.5	37.2	92.7	82.7	83.8	84.2
World	100	100	100	100	100	100	100	100				
US\$ billion	1,093	2,386	9,618	13,400	797	1,922	7,902	10,756	72.9	80.6	82.2	80.3

Note:

1. Asia = East Asia +South Asia; East Asia = Developing East Asia + Japan; Developing East Asia: China, Hong Kong, South Korea + Taiwan + ASEAN countries.
2. Total merchandise exports net of oil and gas exports.
3. Commodities classified under the Standard International Trade Classification (SITC) codes 5 through 9 less SITC 68 (nonferrous metals).

Data not available

Source: Compiled from UN Comtrade database, and Trade Data CD-ROM, Council for Economic Planning and Development, Taipei (for data on Taiwan)

**Table 2: Commodity Composition of Manufacturing Exports for Asian Countries<sup>1</sup> (2010-11)<sup>4</sup> (%)**

County/country group <sup>2</sup>	Chemicals (5)	Products classified by material (6)	Machinery and transport equipment (SITC 7)				Miscellaneous manufacturing (8)		Total
			Total	ICT <sup>3</sup> products (75+76+772+776)	Electrical good (77 - 772 - 776)	Road vehicles ( - 78)	Total	Apparel (84)Apparel	
Asia	7.3	13.2	58.9	37.2	6	15.6	18.6	5.3	100
East Asia	7.4	12.3	59.8	36.4	6.2	15.7	18.2	5.2	100
Japan	8.3	10.3	72.1	23.7	5.5	23.4	9.3	0.1	100
Developing East Asia	6.5	11.8	59.2	44.3	6.4	3.4	22.5	7.1	100
Taiwan	11.3	17.2	56.7	33.5	8.6	3.6	14.8	0.8	100
Korea	9.3	12.2	69.8	39.1	4.8	12.7	8.7	0.9	100
China	3.9	12.4	56.3	36.1	7.4	1.5	27.4	9.2	100
Hong Kong	4.4	15.3	45.9	34.7	6.1	0.4	34.4	15	100
ASEAN10	9.1	8.8	66.8	53.1	4.3	2.6	15.3	5.4	100
Indonesia	9.5	25.3	37.6	24.6	6.4	2.5	27.6	12.6	100
Malaysia	5.9	6.4	78.2	71.7	3.4	0.6	9.5	2.3	100
Philippines	1.3	3.1	85.1	74.8	6.4	1.4	10.5	4.9	100
Singapore	22.7	3.7	66.6	54.7	2.9	0.5	7.0	0.3	100
Thailand	9.3	12.7	65.4	39.6	5.1	11.2	12.6	4.8	100
Vietnam	2.5	10.3	18.0	8.6	4.1	1.5	69.2	26.1	100
Other ASEAN	0.3	4.0	2.0	0.5	0.3	0.6	93.7	85.6	100
South Asia	13	40.3	11.6	1.9	2	2.6	35.1	25.5	100
India	16.4	41.5	23.2	1.2	1.6	20.1	18.9	13.7	100
Bangladesh	1.6	9.2	1.0	1.6	0.1	0.3	88.2	86.3	100
Pakistan	2.8	60.2	1.3	0.2	0.1	0.2	35.7	28.7	100

continued

**Table 2 (Continued)**

County/country group <sup>2</sup>	Chemicals (5)	Products classified by material (6)	Machinery and transport equipment (SITC 7)				Miscellaneous manufacturing (8)		Total
			Total	ICT <sup>3</sup> products (75+76+772+776)	Electrical good (77 - 772 - 776)	Road vehicles (78)	Total	Apparel (84)Apparel	
NAFTA	15.8	12	58.9	17.2	4.9	15.7	13.3	1.0	100
EU	21.6	17.4	48.4	10.7	3.7	15.6	12.6	1.8	100
World	13.5	16.2	54.3	21.2	4.8	11.6	16.0	3.8	100

Notes:

1. The SITC commodity code is given under each commodity nomenclature.
2. Asia = East Asia +South Asia; East Asia = Developing East Asia + Japan; Developing East Asia: China, Hong Kong, South Korea + Taiwan + ASEAN countries.
3. ICT Information and communication technology products (SITC 75+76+77)

Source: Compiled from UN Comtrade database, and Trade Data CD-ROM, Council for Economic Planning and Development, Taipei (for data on Taiwan)

**Table 3: World Exports Shares of Selected manufactured Products<sup>1</sup> (%)**

Country/country groups <sup>2</sup>	ICT products <sup>3</sup> (75+76+772+776)		Electrical goods (77 - 772 - 776)		Road vehicles (78)		Textiles ( 65)		Apparel (84)	
	1989-90	2010-11	1989-90	2010-11	1989-90	2010-11	1989-90	2010-11	1989-90	2010-11
<i>Asia</i>	37.2	58.0	28.3	42.7	11.2	19.8	37.2	45.3	33.4	52.2
<i>East Asia</i>	37.8	57.9	28.3	42.1	11.0	19.5	34.6	38.1	26.3	45.5
Japan	13.8	9.9	12.9	8.7	8.3	12.5	4.2	2.8	0.4	0.2
<i>Developing East Asia</i>	22.9	48.0	15.8	33.4	2.7	7.0	29.2	35.3	24.7	45.3
Taiwan	4.4	3.8	3.7	4.3	1.1	0.6	7.8	4.6	2.1	0.4
Korea	3.9	6.7	0.8	3.7	1.2	4.3	6.1	4.2	2.0	0.6
China	3.2	22.8	5.2	20.6	0.1	1.7	8.5	20.2	11.2	35.1
Hong Kong	1.9	1.0	1.5	0.8	0.0	0.0	2.9	1.3	3.0	2.6
<i>ASEAN countries</i>	10.2	13.7	4.6	4.0	0.3	0.4	3.4	5.0	5.7	6.6
Indonesia	0.2	0.7	0.2	0.8	0.1	0.1	1.5	2.2	1.2	2.4
Malaysia	4.2	6.2	1.5	1.3	0.1	0.1	0.8	0.6	1.3	1.0
Philippines	0.9	2.5	0.5	0.9	0.0	0.1	0.1	0.2	0.8	0.9
Singapore	4.2	3.9	1.4	0.8	0.0	0.1	0.2	0.2	0.2	0.1
Thailand	1.2	1.5	0.9	1.7	0.1	1.2	0.8	0.2	1.2	1.1
Vietnam 2006/7	---	0.4	---	0.2	---	0.0	0.1	1.8	1.1	2.2
Other ASEAN countries	---	0.0	---	0.0	---	0.0	---	0.1	---	1.3
<i>South Asia</i>	0.1	0.1	0.2	0.6	0.2	0.3	5.6	7.2	4.2	6.7
India	0.1	0.1	0.1	0.5	0.2	0.3	2.8	3.9	2.9	3.2
Developed countries	61.2	34.5	67.9	47.2	90.5	76.2	46.7	36.3	27.2	16.2
Developing countries	38.8	65.5	32.1	52.8	9.5	23.8	53.3	63.7	72.8	83.8

*Notes*

1. The SITC commodity code is given under each commodity nomenclature.
2. Asia = East Asia +South Asia; East Asia = Developing East Asia + Japan; Developing East Asia: China, Hong Kong, South Korea + Taiwan + ASEAN countries.
3. ICT Information and communication technology products

Source: Compiled from UN Comtrade database, and Trade Data CD-ROM, Council for Economic Planning and Development, Taipei (for data on Taiwan)

**Table 4: Geographic profile of world manufacturing trade: Total trade and network trade (percent)****(a) Exports**

	Total Manufacturing		Network Products					
	1992-3	2007-8	Parts and components		Final assembly		Total	
			1992-3	2007-8	1992-3	2007-8	1992-3	2007-8
East Asia	28.3	34.0	29.6	42.8	34.1	37.5	32.2	40.3
Japan	12.3	7.2	15.2	9.1	20.8	9.9	18.4	9.5
Developing East Asia (DEA)	16.0	26.8	14.4	33.7	13.3	27.6	13.8	30.9
China	4.5	14.3	1.7	13.5	2.4	15.7	2.1	14.5
Hong Kong, China	1.8	0.7	1.5	0.8	1.2	0.5	1.3	0.7
Taiwan	2.9	2.5	3.7	4.0	2.0	2.2	2.7	3.2
South Korea	2.3	3.4	2.2	5.6	2.0	3.7	2.1	4.7
ASEAN	4.5	6.0	5.2	9.8	5.8	5.5	5.6	7.8
Indonesia	0.6	0.6	0.1	0.5	0.1	0.5	0.1	0.5
Malaysia	1.2	1.7	1.7	3.4	1.9	1.8	1.8	2.6
The Philippines	0.3	0.7	0.5	1.8	0.2	0.4	0.4	1.2
Singapore	1.5	1.4	2.3	2.6	2.6	1.0	2.5	1.9
Thailand	0.8	1.3	0.6	1.4	0.9	1.8	0.8	1.6
Viet Nam	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.1
South Asia	0.9	1.3	0.1	0.4	0.1	0.2	0.1	0.3
India	0.6	1.0	0.1	0.4	0.1	0.2	0.1	0.3
NAFTA	17.2	14.0	25.3	16.2	20.6	16.6	22.6	16.4
EU 15	41.3	35.4	39.2	29.3	35.3	31.4	37.0	30.3
Developed countries	72.4	56.6	76.7	52.7	78.6	56.1	77.8	54.3
Developing countries	27.6	43.4	20.8	46.8	22.9	44.4	22.0	45.7
World	100	100	100	100	100	100	100	100

continued

**Table 4 (Continued)****(b) Imports**

	Total Manufacturing		Network Products					
	1992-93	2007-8	Parts and components		Final assembly		Total	
			1992-93	2007-8	1992-93	2007-8	1992-93	2007-8
East Asia	21.7	23.7	30.1	36.6	14.3	18.1	21.0	28.1
Japan	4.1	3.5	4.0	<b>3.8</b>	<b>3.0</b>	3.3	3.4	3.5
Developing East Asia (DEA)	17.6	20.3	26.1	32.8	11.2	14.9	17.6	24.5
China	2.9	7.1	3.0	11.5	1.5	6.0	2.2	9.0
Hong Kong, China	4.4	3.6	5.4	6.3	2.8	2.1	3.9	4.4
Taiwan	2.1	1.6	3.1	2.3	1.4	1.2	2.1	1.8
South Korea	2.0	2.2	3.1	2.5	1.1	1.6	1.9	2.1
ASEAN)	6.2	5.8	11.5	10.2	4.4	4.0	7.4	7.3
Indonesia	0.8	0.4	1.1	0.3	0.3	0.3	0.6	0.3
Malaysia	1.4	1.3	3.0	2.4	1.1	1.2	1.9	1.9
The Philippines	0.4	0.5	0.6	1.2	0.2	0.4	0.4	0.8
Singapore	2.3	2.1	4.8	4.5	2.0	1.5	3.2	3.2
Thailand	1.3	1.1	2.0	1.4	0.8	0.6	1.3	1.0
Viet Nam	0.0	0.4	0.0	0.3	0.0	0.2	0.0	0.2
South Asia	0.9	1.3	0.7	1.1	0.4	0.9	0.6	1.0
India	0.5	1.1	0.4	0.9	0.2	0.8	0.3	0.8
Oceania	16.6	18.6	31.8	19.6	8.5	17.9	18.5	18.8
NAFTA	1.8	2.4	2.7	3.2	1.0	2.0	1.7	2.6
EU 15	42.0	35.2	<b>45.5</b>	29.9	7.5	15.9	23.8	23.5
Developed countries	71.4	61.1	82.7	52.3	68.8	66.8	74.7	59.0
Developing countries	28.6	38.9	17.3	47.7	31.2	33.2	25.3	41.0
World	100	100	100	100	100	100	100	100

Source: data compiled from UN Comtrade database.

**Table 5: Share of network products in manufacturing trade, 1992-93 and 2007-08 (percent)**

	Parts and components		Final assembly		Total network products	
	1992-93	2007-08	1992-93	2007-08	1992-93	2007-08
<b>(a) Exports</b>						
East Asia	20.2	34.3	31.6	26.4	51.8	60.7
Japan	23.9	34.3	44.5	32.3	68.4	66.6
Developing East Asia (DEA)	17.3	34.0	21.8	25.2	39.1	59.2
People's Republic of China (PRC)	7.4	25.5	13.7	26.6	21.1	52.1
Hong Kong, China	15.8	33.3	18.0	17.8	33.8	51.1
Taiwan	24.7	44.2	17.6	21.5	42.3	65.7
Republic of Korea	18.1	44.2	22.2	25.4	40.3	69.5
ASEAN	22.7	44.2	34.1	22.0	56.8	66.2
Indonesia	3.8	21.5	5.6	16.8	9.3	38.4
Malaysia	27.7	53.6	40.7	25.1	68.4	78.8
The Philippines	32.9	71.7	20.5	15.6	53.4	87.3
Singapore	29.0	49.3	45.9	17.2	74.9	66.5
Thailand	14.1	29.9	29.0	33.0	43.1	62.9
Viet Nam	---	11.0	---	7.6	---	18.5
South Asia	2.3	8.2	2.9	3.1	5.1	11.3
India	3.0	10.4	3.4	3.8	6.4	14.2
North American Free Trade Area (NAFTA)	28.4	31.2	31.4	28.1	59.7	59.3
Mexico	42.1	34.6	30.8	42.1	72.9	76.6
European Union (EU) 15	18.3	22.4	22.4	21.1	40.7	43.5
Developed countries	20.4	25.2	28.5	23.6	48.9	48.8
Developing countries	14.6	29.2	21.8	24.3	36.4	53.6
World	19.3	27.1	26.3	23.8	45.5	50.9

Table 5 (Continued)

	Parts and components		Final assembly		Total Network products	
	1992-93	2007-08	1992-93	2007-08	1992-93	2007-08
<b>(b ) Imports</b>						
East Asia	27.2	42.0	17.2	17.8	44.4	59.8
Japan	19.3	29.2	19.3	21.9	38.6	61.1
Developing East Asia	29.0	44.4	16.7	17.3	45.8	61.7
PRC	20.4	44.0	14.0	19.8	34.4	63.7
Hong Kong, China	24.1	48.5	16.5	13.5	40.6	62.1
Taiwan	29.5	38.9	18.0	16.8	47.5	55.7
Republic of Korea	30.1	31.9	14.6	17.4	44.7	49.3
ASEAN	36.0	47.8	18.4	16.2	54.4	64.0
Indonesia	27.0	21.8	9.2	15.8	36.1	37.7
Malaysia	40.5	50.0	20.2	22.0	60.7	72.0
The Philippines	32.6	61.3	15.0	17.4	47.6	78.6
Singapore	39.9	60.4	21.9	17.3	61.8	77.7
Thailand	30.6	36.1	15.6	12.4	46.2	48.5
Viet Nam	---	19.1	---	9.7	---	28.8
South Asia	16.6	23.8	12.9	16.5	29.5	40.3
India	17.5	22.9	10.6	17.0	28.1	39.9
NAFTA	37.4	28.8	13.4	22.4	50.7	51.2
Mexico	29.4	36.1	14.2	19.0	43.7	55.1
EU15	21.2	23.2	4.7	10.6	25.9	33.8
Developed countries	22.6	23.4	25.2	25.5	47.8	48.9
Developing countries	11.9	33.6	28.6	19.9	40.4	53.4
World	19.6	27.3	26.2	23.3	45.7	50.7

Note: --- Negligible (less than 0.05%)

Source: Compiled from UN Comtrade database.

**Table 6 Share of parts and components in bilateral trade flows, 2007/8 ( %)**

Reporting country	EA	Japan	DEA	PRC	ASEAN	NAFTA	EU15	World
<b>(a) Exports</b>								
East Asia (EA)	47.6	32.9	50.1	51.6	54.5	25.1	24.1	34.1
Japan	42.0	0.0	42.0	41.5	47.9	31.5	30.4	34.4
Developing East Asia (DEA)	48.1	33.4	53.9	0.0	65.2	22.7	21.6	34.0
China (PRC)	36.2	25.2	40.6	0.0	49.1	17.1	16.3	25.6
Korea	61.9	51.5	63.5	57.3	63.7	36.6	26.8	44.2
Taiwan	51.5	59.0	50.5	39.5	61.2	35.0	37.6	44.2
ASEAN10	58.2	39.9	61.4	64.0	56.0	32.1	33.9	44.2
NAFTA	46.7	36.5	49.8	34.8	67.9	28.8	30.6	31.2
EU15	31.4	18.7	34.8	30.4	46.5	22.1	22.0	22.4
<b>(b) Imports</b>								
East Asia (EA)	51.7	48.8	52.8	34.8	68.3	54.7	33.1	42.1
Japan	34.2	0.0	34.2	23.1	44.9	41.0	18.9	29.9
Developing East Asia (DEA)	55.5	47.7	59.5	0.0	74.3	40.3	31.7	44.2
China (PRC)	55.2	47.5	59.2	0.0	74.0	40.1	31.6	44.0
Korea	33.0	26.6	38.1	26.1	55.7	38.9	22.9	31.9
Taiwan	46.7	33.8	58.3	44.1	68.8	40.2	28.0	38.9
ASEAN10	50.3	47.2	51.4	40.1	55.9	67.5	41.7	47.9
NAFTA	29.4	39.3	26.0	17.7	40.5	36.3	25.1	28.8
EU15	25.0	33.6	22.8	14.9	37.9	34.1	22.1	23.4

Note:

1. EA: East Asia, DEA: Developing East Asia; ASEAN6: six main ASEAN countries; EU15: 15 member countries of the European Union; NAFTA: countries in the North American Free Trade Agreement (USA, Canada and Mexico)

Source: Compiled from UN Comtrade database.

**Table 7 Intra-regional shares of manufacturing trade: Total, parts and components, and final trade, 1992-93 and 2006-08<sup>1</sup> (percent)**

	East Asia	Developing East Asia	ASEAN	NAFTA	EU15
(a) Total trade					
Exports					
1992-93	47.2	38.2	20.7	44.4	61.2
2007-08	43.9	33.5	18.4	48.1	56.8
Imports					
1992-93	58.2	34.9	15.5	36.3	64.1
2007-08	64.4	46.6	20.8	32.0	57.8
Trade (exports + imports)					
1992-93	53.2	36.5	17.8	39.9	62.6
2007-08	55.2	40.4	20.1	38.4	57.5
(b) Parts and Components					
Exports					
1992-93	50.2	42.6	30.3	43.5	62.3
2007-08	61.1	53.9	25.4	46.9	55.9
Imports					
1992-93	65.9	35.3	20.2	39.5	58.0
2007-08	66.9	50.9	22.9	39.9	55.2
Trade					
1992-93	57.0	38.7	24.1	41.4	60.1
2007-08	63.0	52.2	23.3	43.2	55.5
(c) Final Goods <sup>3</sup>					
Exports					
1992-93	46.0	36.8	16.1	44.7	60.9
2007-08	36.9	28.3	15.9	48.7	57.0
Imports					
1992-93	55.4	34.7	12.9	35.3	65.6
2007-08	63.0	42.8	20.6	30.2	58.5
Trade					
1992-93	50.3	35.7	14.3	39.4	63.3
2007-08	44.2	34.1	18.1	37.4	57.3

Note: 1. Intra-regional trade shares have been calculated excluding bilateral flows between China and Hong Kong.

2. ASEAN+3=ASEAN+ Japan + Korea +China

3. Total (reported) trade (a) – parts and components (b).

Source: Compiled from UN Comtrade database, and Trade Data CD-ROM, Council for Economic Planning and Development, Taipei (for data on Taiwan)

